

Summaries of PhDs awarded by University of Kerala (2015)



Internal Quality Assurance Cell (IQAC)
University of Kerala
2016

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DEO, University of Kerala

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2016

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Preface

University of Kerala accepted 343 PhD dissertations in 2015. All the PhD dissertations are archived in the Kerala University Library (with over 4000 dissertation so far) and also being uploaded into the *Shodhganga* on-line repository maintained by UGC. However it is practically impossible to get an overview of the research reported in these theses, spread over nearly 50 subjects in voluminous reports running to over 50,000 pages in total. Any assessment of the research work therefore remains to be enabled by a convenient compilation. The Internal Quality Assurance Cell of the University of Kerala has therefore chosen to compile summaries of all PhD theses in a standart format. The following is a snapshot of statistics:

Total No. of PhDs awarded in 2015	343
PhDs awarded stream-wise	Science & Technology: 171 Social Science: 94 Arts and Humanities: 78
No. of abstracts compiled in this Volume	198
Average No. of Pages in thesis	Science and Technology: 220 Social Science: 283 Arts and Humanities: 293 Overall: 249
Average No. of references cited	Science and Technology: 282 Social Science: 243 Arts and Humanities: 123 Overall: 241

About 60% of the scholars who were awarded PhD in 2015 have obliged with our request. This compilation is being released for enabling stake holders of University of Kerala to study and analyse the same.

Vice-Chancellor

Stream: Science & Technology

Subject: *Biochemistry*

Title: “Identification of specific microRNAs involved in differentiation of retinal ganglion cells”	
Researcher: Abdul Rasheed .V .T	Guide: Dr. Jackson James
Subject: Biochemistry	
<p>Retinal ganglion cells (RGCs) are one of the specialized neurons among the seven cell types in the retina that transmit the visual signals to the brain. In view of the recent advances, particularly regarding the post-transcription regulation by miRNAs in retina, we have looked into the miRNAs that could potentially target <i>Brn3b</i> and thereby regulate RGC differentiation during development. Here, we initially used an <i>in silico</i> approach to identify miRNAs that are specific to RGCs and demonstrated the role of miR-23a and miR-374 in regulating the developmental wave of expression of the RGC marker <i>Brn3b (Pou4f2)</i> during development of RGCs. Secondly, we demonstrated that the wave of <i>Brn3b</i> expression is regulated by a coordinated expression of miR-23a and miR-374 during the developmental of retina and their over-expression in retinal explants reduced the expression of <i>Brn3b</i> in the Ganglion cell layer (GCL) of the retina. Next, we demonstrated the role of miR-23a and miR-374 acting on various factors in the intraretinal axon guidance pathway, specifically the Robo-Slit mediated guidance which directs the RGC axons to their proper destinations. The expression of <i>Robo2</i> seems to be regulated during the late phase of RGC by miR-23a/miR374 while <i>Robo1</i> may be regulated by miR-23a alone and this may be a mechanism to regulate the axon guidance factors within the retina. Thus, we provide convincing evidences for the existences of a co-ordinated mechanism in regulating the timing of <i>Brn3b</i> expression by miR-23a and miR-374, which will ultimately regulate the development of RGCs from their progenitors and later their survival and axonal guidance. Overall, ours and previous studies would be useful in finding the physiological importance of miRNAs in retinal degenerative diseases and designing treatments targeting them.</p>	
Major publication appeared in: Developmental Neurobiology	
Total Pages of the thesis: 264	
Total No. of references cited in the thesis: 226	
Email of Researcher: rasheedvayanthodi@gmail.com	

Title: “A comparative study on the impact of high carbohydrate diet on isoproterenol induced myocardial infarction”

Researcher: Febi John

Guide: Dr. M. Indira

Subject: Biochemistry

Diet and nutrition are widely believed to play an important role in the development of cardiovascular diseases (CVD). Myocardial infarction (MI) is the most important cause of mortality among the CVD's. The roles of different dietary intake in CVD are gaining importance as it will help in early intervention in the progression of the diseases. White rice and cassava are carbohydrate rich foods. Thus, the present study is based on the hypothesis that high carbohydrate (HC) diet (75% carbohydrate) when compared to standard diet (60% carbohydrate) influence the incidence of CVD. The study conducted on experimental animals showed an increased lipogenesis, decreased mitochondrial energy metabolism, increased oxidative stress markers, accelerated 5-LO pathway and upregulation of RAGE-NF-κB pathway in the HC diet groups, both in control and ISO groups when compared to standard groups. The effect was higher for white rice when compared to cassava in both control and ISO groups. The endothelial dysfunction was also found higher in white rice fed group. The effect of HC diet in Nrf2 dependent upregulation of hypertrophic markers and left ventricular remodeling showed increased hypertrophic responses and collagen expression in the LV in HC diet fed rat heart. The hypertrophy and remodeling was higher in the white rice fed group. Thus, HC diet consumption especially white rice when compared to cassava creates a more vulnerable environment in the heart which may increase the complications of cardiac damages.

Keywords: Myocardial infarction, high carbohydrate diet, white rice, cassava,

Major publication appeared in: *Journal of Global Biosciences*

Total no. of pages in the thesis: 237

Total no. of references cited in the thesis: 467

Email of Researcher: *febijohn1985@gmail.com*

Title: “Polymeric Nanocapsules Mediated Therapeutic Strategies in Atherosclerosis”

Researcher: Janeesh .P .A

Guide: Dr. Annie Abraham

Subject: Biochemistry

Polymer nanocapsules were synthesised according to the established procedures and were characterised successfully using scanning electron microscope. After characterization, preliminary toxicity studies were done and found to be non toxic and further moved to detailed study. Natural products have long been recognized as important sources for therapeutically effective medicines. Robinin (Kaempferol 3-O-robinoside-7-O-rhamnoside) is one of the derivatives of Kaempferol; it is present in flavonoid fraction of *Vigna unguiculata* leaf which is edible and unexplored for any activity. The *in vitro* anti-inflammatory potential of Robinin - a flavonoid - showed that it ameliorates the inflammatory insult by inhibiting transcriptional activation. The *in vivo* study on atherosclerotic rats showed that Robinin possess antioxidant, hypolipidemic and anti-atherogenic property in ameliorating cholesterol induced atherosclerosis. Encapsulation of Robinin to polymeric nanocapsules has been characterised by FTIR and UV spectrum. *In vitro* drug release study showed efficient release of the drug from polymeric nanocapsule delivery system after 72 hours of study. Cellular uptake studies using Robinin encapsulated nanocapsules showed an efficient uptake. Oil red staining of macrophages were done to assess the amount of lipid content in foam cells. Overall, *in vitro* study revealed significant inhibition of macrophages transformed foam cell by Robinin encapsulated polymeric nanocapsule drug delivery system and further moved to in vivo studies. The polymeric nanocapsule loaded Robinin showed efficient anti-atherogenic and anti-inflammatory potential in reducing cholesterol induced foam cell triggered atherosclerosis in rats.

Major publication appeared in: Chemical biology and Drug design

Total number of pages in thesis: 212

Total number of Reference cited in thesis: 283

Email of researcher: janeesh1biochemistry70@gmail.com

Title: “Studies on *Tamarindus indica* polysaccharide nanoparticle as immunomodulatory / anticancer agent and as a potent drug carrier”

Researcher: Manu M. Joseph

Guide: Dr. T. T. Sreelekha

Subject: Biochemistry

Co-Guide: Dr. S. Mini

A novel strategy for synthesis and stabilization of AuNPs using anticancer polysaccharide PST001 was employed and its antitumor activity was evaluated over six human and two murine cancer cell lines. PST-Gold nanoparticles with an average size of 20 nm were prepared in which PST001 acts both as a reducing and a capping agent with a high stability for over 12 months and a wide range of pH. PST-Gold nanoparticles showed an enhanced cytotoxic effect even at a lower concentration through the induction of apoptosis. In vivo assays on BALB/c mice revealed that PST-Gold nanoparticles exhibited superior immunomodulatory effects without any toxicity. Evaluation of the in vivo antitumor activity in DLA and EAC murine ascites and EAC solid-tumor syngeneic mouse models revealed its potent antitumor effects with significant survival rate. PST-Dox nanoparticles with an average size of 10 nm were prepared via conjugation of doxorubicin to PST001. The PST-Dox nanoparticles exhibited a pH-responsive Dox release in the acidic pH of 4.5, favoring as high as 90% Dox release in a sustainable manner and demonstrated enhanced cytotoxic effects through the induction of apoptosis. In vivo toxicity studies demonstrated a lower LD₅₀ for Dox and a higher LD₅₀ for the PST-Dox which supported the safety and efficacy of this formulation compared to Dox. Biodistribution data substantiated the tumor-specific delivery of these particles. In vivo antitumor activity tested in DLA and EAC murine ascites and EAC solid-tumor syngeneic mouse models administered with PST-Dox nanoparticles showed significantly reduced tumor volume and percentage increase in life span of tumor-bearing mice in both the ascites and solid tumor models. Molecular mechanism of action of PST-Dox nanoparticles in the genomic level was elucidated on cancer cell lines and lymphocytes by whole genome microarray expression analysis. Most of the key down regulated genes upon PST-Dox administration are tyrosine kinases indicating the potential mechanism of drug action could be by inhibiting tyrosine kinase oncogenic pathways. To conclude, both PST-Gold and PST-Dox nanoparticles are superior to its parent counterparts suggesting the promising role of a new cell-adaptive drug delivery nanosystem for the effective treatment of cancer.

Keywords: *Tamarindus indica*, Cancer, Nanoparticles, DLA, EAC, Doxorubicin.

Major Publications: Journal of Biomedical Nanotechnology 2014; 10: 1-16; Colloids and Surface B: Biointerfaces 2014; 116: 219-227; Colloids and Surface B: Biointerfaces 2013; 104: 32-39; Recent Patents on Material Sciences 2014; 7(1): 8-25; European Journal of Pharmaceutics and Biopharmaceutics 2015; 93: 183-195; Translational Oncology 2014; 7(5): 525-536.

Email: manumjoseph2000@gmail.com

Title: “Investigations on the Combined Administration of Alpha-tocopherol and Ascorbic acid on Ethanol Induced Toxicity in Experimental Animals”

Researcher: P. Prathibha

Guide: Dr. M. Indira

Subject: Biochemistry

Alcoholic liver disease represents a spectrum of clinical illness and morphological changes that range from fatty liver to hepatic inflammation and necrosis to progressive fibrosis. Many vitamins like A, D, E, K, C and B are deficit in alcoholics. The major objective of our study was to evaluate the synergistic effect of α -tocopherol and ascorbic acid in combating ethanol induced oxidative stress in liver and brain. The excessive metabolism of ethanol induces oxidative stress. This activates transcription of NF κ B to the nucleus and the release of endotoxins into circulation due to gut permeabilisation. Endotoxin in circulation activates kupffer cells to upregulate factors involved in fibrosis. Excessive oxidative stress also leads to mitochondrial dysfunction by decreasing the levels of ATP and mitochondrial membrane potential. All these factors lead to the release of cytochrome c to cytosol thus triggering apoptosis. To conclude, supplementation of α -tocopherol and ascorbic acid in combination was effective in reducing ethanol induced toxicity better than either supplementation of AT or AA alone owing to their different subcellular locations. The mechanism of action may be by activating the transcription of Nrf2 into the nucleus which upregulates the activities of scavenging enzymes and reduces the activities of toxicity markers by decreasing the transcription of NF κ B into the nucleus and hence fibrosis.

Keywords: Alpha tocopherol, Ascorbic acid, Nrf2, Oxidative stress, fibrosis, NF κ B

Major Publication appeared in: Redox Report

Total no: of pages in the thesis: 258

Total number of reference cited in the thesis: 406

Email of the Researcher: ammuprabhakaran@gmail.com

Title: “ Studies on cardiac hypertrophy and its possible attenuation by <i>Boerhaavia diffusa</i> L. ”	
Researcher: Prathapan .A	Guide: Dr. K. G. Raghu
Subject: Biochemistry	
<p>Cardiovascular diseases are one of the leading causes of death worldwide. Among these diseases, cardiac hypertrophy has been the leading cause for morbidity and mortality. Since pathological cardiac hypertrophy is identified as the most powerful predictor for the development of heart failure, much effort is currently undertaken to investigate the etiology of hypertrophy and to unravel the molecular pathways underlying this affliction and the efforts are also ongoing to find novel treatment modalities to prevent or even reverse human heart failure. In this respect, we selected a well-known edible cardiogenic medicinal plant; <i>Boerhaavia diffusa</i> L., from the family <i>Nyctaginaceae</i> to evaluate its protective potential against cardiac hypertrophy using both <i>in vitro</i> and <i>in vivo</i> models. Ethanolic extract and its different fractions of <i>Boerhaavia diffusa</i> were screened for their antioxidant potential and cytotoxicity and found that ethanolic extract (BDE) was rich in polyphenols and evaluated against angiotensin II induced cardiac hypertrophy in H9c2 cells. The results showed that pretreatment with BDE reduced hypertrophic response of the cardiac cells by attenuating oxidative stress, mitochondrial dysfunction, intracellular calcium overload and apoptosis. In order to validate the results of <i>in vitro</i> studies, we evaluated the protective potential of BDE against angiotensin II induced cardiac hypertrophy in rats and the results of the study clearly showed that <i>Boerhaavia diffusa</i> offers significant protection against pathological cardiac hypertrophy in rats. Thus the present study gives an insight in to the antihypertrophic potential of <i>Boerhaavia diffusa</i> for the first time and can be used as a nutraceutical/medicinal food for the prevention and management of cardiac hypertrophy and other associated disorders.</p>	
Major Publication appeared in; (1) British Journal of Nutrition, (2) Plos One	
Total number of pages in the thesis: 190	
Total number of references cited: 410	
Email of Researcher: prathapsbs@gmail.com	

Title: “Effects of Ksheerabala and its ingredient <i>Sida cordifolia</i> Linn. on alcohol induced toxicity”	
Researcher: Rejitha .S	Guide: Dr. M. Indira
Subject: Biochemistry	
<p>Ksheerabala is an ayurvedic drug, which is used as a nerve tonic. The main ingredients of ksheerabala are <i>Sida cordifolia</i>, sesame oil and cow’s milk. Ksheerabala has protective effect on quinolinic acid induced neurotoxicity. Alcohol abuse is a significant public health problem. Alcohol abuse can result in liver and brain damage. Hence we studied the impact of ksheerabala and <i>Sida cordifolia</i> on alcohol induced toxicity and its mechanism of action. The ksheerabala and the plant possessed antioxidant, anti-inflammatory, antifibrotic and neuroprotective potential against alcohol induced toxicity. The mechanism of action may be reducing the metabolism of alcohol and generation of toxic metabolites and thus oxidative stress. This caused decreased translocation of NFκB and thereby further downregulated inflammatory cascade and progression of liver fibrosis. The phytochemical analysis of various fractions of <i>sida cordifolia</i> revealed that sugar, starch, polyphenols, saponins, alkaloids, flavanoids, aminoacids and steroids were present in plant roots. HPLC chromatogram of methanolic fraction <i>Sida cordifolia</i> possess vasicine and vasicinone, which exhibits a wide range of properties of anti-inflammatory and analgesic activity. The observed antioxidant and anti-inflammatory potential of <i>Sida cordifolia</i> in the present study may be due to the beneficial effects of these compounds.</p>	
Keywords: Alcohol, Ksheerabala, <i>Sida cordifolia</i> Linn., Neurotoxicity, oxidative stress	
Major publication appeared in : Redox Report, British Journal of Nutrition, Ayu	
Total number of pages in the thesis: 226	
Total number of reference cited in the thesis: 328	
Email of the Researcher-rejitha009@gmail.com	

Title: “Anti-inflammatory and anti-arthritic potentials of alginic acid isolated from Marine algae *Sargassum wightii* Greville.”

Researcher: Saritha Kumari .C .H

Guide: Dr. G. Muraleedhara Kurup

Subject: Biochemistry

Seaweeds are a major group of plants in marine environment. *Sargassum wightii* is one of the important species belonging to the genus *Sargassum* with a wide range of bioactive properties. The *Sargassum* species, a brown warm water macroalgae with variously shaped plastids in each cell, is rich in carotenoids, fatty acids, phycobillins, vitamins, sterols, tocopherols and polysaccharides such as mannitol, cellulose, alginate, fucoidan, fucoxanthine, and laminaran. Marine polysaccharides are a vast resource of untapped potential and are finding more uses in the biotechnological and biopharmaceutical industries. Rheumatoid arthritis (RA) is a chronic joint inflammatory disease that affects more than 1% of the general population which is more prevalent among women even in developed countries. Many chemical drugs used to treat rheumatoid arthritis have potentially serious side effects. Recently natural drugs are used, which include plant source and marine sources. So in this work, different marine brown algae were screened for their anti-inflammatory and antioxidant potentials. Dose dependent study of alginic acid from different brown algae was carried out. Alginic acid extracted from *Sargassum wightii* showed maximum anti inflammatory and anti oxidant activity which was used for the study. In summary bioactive potentials of *Sargassum* species collected from Kerala was evaluated and was found to possess good antioxidant capacities along with found to have good antioxidant capacities with anti inflammatory property.

Keywords: *Sargassum wightii*, Arthritis, alginic acid, Anti –inflammatory, Anti –oxidant.

Journals in which major publications appeared in: Inflammopharmacology, International Immunopharmacology, comparative clinical pathology.

Total number of pages in thesis: 151

Total number of reference cited in the thesis:295

Email:sarithatvm2008@gmail.com

Title: **“Tumor localization and photosensitization by squaraine dye in *in vitro* and *in vivo* cancer models”**

Researcher: Soumya .M .S

Guide: Dr. Annie Abraham

Subject: Biochemistry

Photodynamic therapy (PDT) is a treatment mode for cancer, involving three key components; a photosensitizer, light and tissue oxygen. The dye selected in our study- Symmetrical diiodinated squaraine (SQDI) - is one of the newly developed photosensitizers. We have examined the photodynamic therapeutic efficacy of SQDI on *in vitro* and *in vivo* cancer models. The *in vitro* cytotoxicity studies revealed that the dye is not cytotoxic in the absence of light. The *in vitro* PDT studies on cancer cells show that cytotoxicity is induced by the synergistic effect of light and dye. The level of apoptotic marker enzymes indicates that the cell death might have been induced by apoptosis and confirmed by FACS analysis. For the *in vivo* studies, Swiss albino mice were used as the experimental model. Biodistribution studies show that the concentration of dye in various tissues is maximal at 4h and was completely removed from the tissues by 24h after administration. Acute toxicity studies show the nontoxic nature of the dye. To determine the photodynamic therapeutic efficacy of SQDI *in vivo*, skin tumor induced mice were taken as experimental models since skin is one of the most widely exposed tissues to environmental carcinogens and its progression/cure can be monitored easily. The tumor statistics and the hematological parameters reverted to near normal levels after PDT, which indicates the therapeutic action of squaraine PDT. The pattern of tumor markers in our study clearly show that PDT with SQDI as a photosensitizer possesses clinical applications, supporting the early reported *in vitro* studies. After establishing the curative role of squaraine PDT, we looked for its site specific effects. A significant increase in the activity of apoptotic markers along with protein and gene expression studies in the squaraine PDT treated group shows that tumor destruction is through oxidative stress mediated apoptosis. Altogether, from the present study, it can be concluded that the dye selected for our study (Symmetrical diiodinated squaraine) is a promising agent that finds application in photodynamic therapy with high selectivity in killing cancer cells without any significant toxicity to the normal tissues.

Major publication appeared in: Chemico-Biological Interactions

Total number of pages in the thesis: 180

Total number of references cited in the thesis: 253

Email of the researcher: soumyamsg@yahoo.co.in

Stream: Science & Technology

Subject: *Botany*

Title: “Screening, Characterisation and Evaluation of Antioxidant Potential of <i>Tylophora asthmatica</i> Wight & Arn., A Promising Medicinal Plant of South Western Ghats”	
Researcher: Archana Devi .V	Guide: Prof. (Dr.) G. M. Nair
Subject: Botany	
<p>This work majorly focused towards the antioxidant active fractions in medicinal plants. For that, at first I selected three medicinal plants and lab experiments pointed towards <i>Tylophora asthmatica</i>. To identify the active compounds, I used TLC, HPLC, NMR and IR. Accession characterization was performed to study the influence of genetic and epigenetic factors in compound production and total antioxidant activity. Nucleotide sequence of each accession of <i>Tylophora asthmatica</i> was given to NCBI and each species specific accession number was obtained and now making ready for publication. Two promising antioxidant active compounds were isolated from this plant species. Pharmacological evaluation ensured to propose that tylophorine and quercetin are two drug lead compounds in <i>Tylophora asthmatica</i>. Micropropagation of the plant was done through shoot multiplication, direct and indirect organogenesis and somatic embryogenesis. Callus culture was exploited for <i>in vitro</i> compound overproduction.</p>	
Journal in which paper was sent and reviewed: Journal of Herbs Spices and Medicinal plants.	
Number of Pages in the thesis: 282	
Number of References cited: 536	

Title: “Phytochemical Evaluation and Identification of Active Principle(s) in *Azima tetraantha* Lam. (Salvadoraceae)”

Researcher: Gayathri .G

Guide: Dr. Bindu R. Nair

subject: Botany

Azima tetraantha Lam.(Family Salvadoraceae) is a traditional herbal medicine used in the villages of South Kerala. The leaves are prescribed to women, for early and effective contraction of uterine muscles, after childbirth. The plant is also reported to be antispasmodic, diuretic, analgesic, anti-inflammatory, stimulant, anti-diabetic, anti-arthritis and anti-rheumatic. The current study focused on the phytochemical profiling of the leaves, through the evaluation of its pharmacological activities. The leaf powder exhibited all the properties characteristic for a drug. Mineral, proximate and nutritional constituents were very high while anti- nutritional constituents were in trace amounts. The leaf powder also showed high Potassium content while lead was completely absent. All these desirable attributes satisfied the criteria of a potent nutraceutical. The phytochemical profile is the first report on the leaves of *A. tetraantha*. Qualitative and quantitative analysis exposed the methanol extract to possess useful phytoconstituents. Moreover, the methanol extract showed significant biological activity including, antimicrobial activity (especially against *Klebsiella pneumonia*, *Bacillus subtilis* and *Aspergillus flavus*), antioxidant property (significantly against hydroxyl radicals, with a positive linear correlation with phenols) and antiproliferative activity (against two cancer cell lines, HeLa and MCF- 7). Flow cytometric studies showed that the cell growth inhibition by methanol extract was done by cell cycle arrest at S phase, in both the cell lines. In order to identify the active constituents in the bioactive methanol extract, the extracts was subjected to analytical techniques such as chromatography and spectroscopy. This resulted in the isolation and characterization of a triterpenoid, friedelin (m.p. 261- 263°C), from the leaf extract. A protocol for the isolation and characterization of friedelin from the leaf extract of *A. tetraantha* could thus be standardized. *Azima tetraantha* can be considered to be cheap source for the bioactive compound friedelin, since the plant grows profusely when the growing conditions are suitable.

Write five keywords: *Azima tetraantha* Lam., Physico-chemical analysis, Pharmacological evaluations, Phytochemical screening, Friedelin

Name of Journal in which major publication appeared: *International Journal of Pharmacy and Pharmaceutical Sciences*

Total No of pages in the thesis: 223

Total No of reference cited in the thesis: 327

Email of Researcher: gaya3uty@yahoo.com

Title: **“Genetic effects of consanguinity in certain castes and communities in Palakkad district (Kerala)”**

Researcher: Jyothilekshmi .P

Guide: Dr. M. V. Sudhakaran

Subject: Botany

Consanguinity is a widely accepted social practice in many societies all over world. Many deleterious recessive traits in man are expressed in higher frequencies among consanguineous offspring. The magnitude of such risk effects depend on the nature and number of deleterious genes present in the gene pool, and on the degree, level and duration of inbreeding. Here detailed consanguinity study was done among seven inbreeding communities of Palakkad district such as the Brahmin, Ezhava, Muslim, Vadukan, Kaikolan, Chetty and Eravallan. The objectives of the study were to (1) identify the patterns of consanguinity (2) assess the level of inbreeding (3) assess the influence of various socio-economic, demographic and geographic factors on inbreeding, (4) analyse the time/temporal trends of consanguinity (5) evaluate public health impact of inbreeding, (6) assess the risk effects of inbreeding (7) estimate genetic load and (8) suggest tangible measures of genetic counselling. The common pattern of consanguinity was first cousin type, while uncle-niece unions were found in the immigrant communities (Brahmin, Kaikolan, Chetty, Eravallan). The frequency of consanguinity ranged from 12.6% (Vadukan) to 34.5% (Eravallan). Association of consanguinity with various socio-economic/ demographic/ geographic factors showed a consistent declining pattern in three communities. Effect of inbreeding on couple fertility, mortality and morbidity were assessed. The mean fertility rates were consistently higher in consanguineous categories. The mortality and morbidity rate in consanguineous progenies were found to be consistently higher and was positively associated with closer degrees of spousal relationship. The public health impact of inbreeding in terms of relative risk (RR) was the highest in communities such as Brahmin and Vadukan, while it was lowest in Ezhava and Eravallan. The higher attributable risk (AR) values suggest that long term inbreeding has not played any role in eliminating the lethal recessive genes from gene pool. The genetic load estimated in terms of lethal equivalents (LE), ranged from 1-2 up to 3-4. The communities with very low LE (1-2) could be endowed with fewer number of highly lethal recessive genes. Genetic counselling measures emphasise the pivotal role of literacy for dispelling the age-old superstitious beliefs and for gaining awareness regarding the harmful effects of inbreeding. Moreover medico-genetic and bio-medical technology and quality health care and diagnostic facilities can also check at-risk children being born.

Keywords: consanguinity, Palakkad district, pattern of consanguinity, risk-effects of consanguinity, relative risk, attributable risk, lethal equivalents

Major publication appeared in: Journal of Cytology & Genetics

Total number of pages in thesis: 295

Total no. of references cited in the thesis: 290

Email of researcher: jyothi.lp.thanal@gmail.com

Title: “Evaluation of Tolerance Mechanism on Plant Pathogen Interactions in *Sesamum orientale* L. against *Alternaria sesame*”

Researcher: Lubaina .A .S

Guide: Dr. K. Murugan

Subject: Botany

Sesame (*Sesamum orientale* L.) of Peadaliaceae is one of the traditional oil seed crops of India. Its seed is a rich source of oil, protein, carbohydrates and natural antioxidants such as sesamin and sesamol. The leaf spot disease caused by the fungus *Alternaria sesami* is one of the major threats to sesame cultivation. The present study aims to unravel the biochemistry of reactive oxygen species (ROS) cycle and to formulate an ecofriendly control measure against the disease. The mode of penetration of pathogen was studied using scanning electron microscopy (SEM). Transmission electron microscopic analysis of plasma membrane, chloroplast and mitochondria also substantiate the SEM data. Analysis of primary metabolites, cell wall constituents, free radicals, total phenols and its fractionation and IR data showed varied profile after pathogen inoculation. Antioxidant enzymes including ascorbate - glutathione cycle is also been duly evaluated. However, seemingly less efficient antioxidative system leading to sustained accumulation of ROS and the observed higher rate of lipid peroxidation indicate that the biochemical events are largely in favour of the pathogen leading to oxidative burst in sesame. Plant extracts of *Mikania scandens*, *Salvinia molesta* and biocontrol agent *Pseudomonas fluorescense* found to be effective bio-remedies against *Alternaria sesami*. Pot and field evaluation revealed efficient rejuvenation of sesame after plant extracts and biocontrol agent treatment and the results were comparable with that of synthetic fungicide Mancozeb.

Keywords: *Sesamum orientale*, *Alternaria sesami*, ROS cycle, Antioxidant enzymes, *Mikania scandens*

Major publication appeared in: Indian Journal of Experimental Biology, Journal of Crop Science and Biotechnology

Total no. of pages in the thesis: 234

Total No. of references cited in the thesis: 298

Email of Researcher: lubainanizam@gmail.com

Title: “Pharmacognostic standardization and chemical characterization of two underutilized species of *Cleome* L. (Cleomaceae) for the isolation of the bioactive glucosinolate, sinigrin”

Researcher: Pillai Lakshmi Sreekumar

Guide: Dr. Bindu R. Nair

Subject: Botany

The genus *Cleome* belongs to the family Cleomaceae and comprises about 150-200 species. Presence of glucosinolates, the active secondary metabolites is a characteristic feature of the families such as Brassicaceae, Cleomaceae and Caricaceae and is responsible for the bitter taste of these plants. One of the major glucosinolates present in Indian mustard seeds is sinigrin, which in turn is the precursor of a promising chemopreventive compound allyl isothiocyanate. The present study focuses on the pharmacognostical characterization of two species of *Cleome*, *C. viscosa* and *C. burmanni* along with the isolation and phytochemical characterization of the glucosinolate, sinigrin. Pharmacognostic studies in both species exhibited several desirable attributes so that the samples could be subsequently used in the form of a drug. The methanol extract exhibited the highest yield per gram dried plant powder in both species. Qualitative analysis revealed the maximum number of compounds in the methanol extracts of both species. Seven phytochemicals were quantitatively analyzed in the methanol extracts of both species. The amount of phenols, flavonoids and cardiac glycosides were high in both species, whereas proanthocyanidins, flavonols and steroids were in moderate amounts. The extracts of both species showed significant antioxidant, anticancer and anti-inflammatory activity. Chemical profiling by GC-MS/MS, FT-IR and HPLC revealed the presence of sinigrin in both species. The methanol extract of both species subjected to chromatographic and spectroscopic techniques resulted in the isolation and characterization of sinigrin from both species. The suitability of sinigrin as a lead candidate for drug industry was revealed by molecular docking studies. The present study is the first report on the isolation of sinigrin from *Cleome viscosa* and *C. burmanni* from India.

Major publication appeared in: International Journal of Pharmaceutical Sciences and Research

Total number of pages in the thesis: 370

Total number of references cited in thesis: 529

Email of the researcher: abrus09@gmail.com

Title: “Tissue culture studies and phytochemical evaluation of *Bidens biternata* (Lour.) Merr. & Sheriff - an ethno medicinal plant.”

Researcher: Pradeesh .S

Guide: Dr. T. S. Swapna

Subject: Botany

Bidens biternata (Lour.) Merr. & Sheriff, endemic to Western Ghats is used as a green leafy vegetable by the different tribes of Kerala and also to cure cold, cough, dysentery, inflammation, hepatitis etc. The plants used as food and medicines were threatened to extinction by unsustainable harvesting and over exploitation of natural vegetation. Owing to its medicinal properties there is a need for mass propagation of *B. biternata*, because conventional method of propagation was not much effective. Among MS, B₅ and White's media tried, MS medium was most effective for the *in vitro* propagation of wild leafy vegetable *B. biternata*. Nutritional evaluation of *B. biternata* indicated that this plant possessed sufficient quantities of nutrients compared to many leafy vegetables reported and exhibited very low quantities of antinutritional factors. Evaluations of non-enzymatic and enzymatic antioxidants indicated the presence of high amount of antioxidants compared to many other green leafy vegetables. It is evident that the wild leafy vegetable, *B. biternata* had high antioxidant activities. The pharmacological evaluation also revealed that the methanolic extracts of *B. biternata* leaves possessed good antiinflammatory, hepatoprotective and anticancer activity. Column chromatography and Thin Layer Chromatography were used for the extraction of bioactive molecule from the crude methanolic extract of *B. biternata* leaves, followed by UV, IR, mass, C¹ and H¹³ NMR spectra analysis for characterization of the compound. The phytochemical characterization revealed that the compound isolated from the *B. biternata* could be quercetin-a flavonoid derivative. The isolated compound quercetin had more *in vitro* antiinflammatory, hepatoprotective and anticancer activities on various cell lines than crude methanolic extract of *B. biternata*. In general, *Bidens biternata* is an excellent candidate which could be used to improve the health benefits and nutrition of people. Also nutraceutical bioactive products could be developed from this green leafy vegetable of Western Ghats.

Keywords: *Bidens biternata*, Nutritional evaluation, antioxidants, pharmacological evaluation, Quercetin.

Major publication appeared in: *Applied Biochemistry & Biotechnology*. Part A: Enzyme Engineering & Biotechnology. Springer.

Total no. of pages in the thesis: 226

Total no. of reference cited in the thesis: 417

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Title: **“Phytochemical characterization of bioactive compounds in *Eleutherine bulbosa* (Miller), Urban.”**

Researcher: Rani .V .S

Guide: Dr. Bindu R. Nair

Subject: Botany

Eleutherine bulbosa (Miller) Urban (family Iridaceae) is commonly known as ‘Neerooty kizhangu’ or ‘Vishanarayani’ among the traditional healers in Kerala. *Eleutherine bulbosa* though an exotic has naturalized in parts of Kerala and Tamil Nadu quite recently. The red coloured underground bulbs of the plant are considered as useful antidote to poisonous bites. Among the many other uses it is used for the curing of painful and irregular menstruation, intestinal verminosis, haemorrhoids, for increasing breast-milk production and also for the treatment of sexual disorders. The present study reports the phytochemical composition of *Eleutherine bulbosa* bulbs. Pharmacognostic evaluation was also carried out for the proper identification and authentication of the bulb (fresh and in powdered form). Ethyl acetate was identified to be the most ideal solvent for leeching of phytochemicals from the bulbs. A relatively high content of phenolic compounds ($86.77 \pm 0.5207 \mu\text{g}$) and flavonoids ($8.7135 \pm 0.3335 \mu\text{g}$) was detected in the extract. The ethyl acetate extract also was identified to consist of bioactive compounds. HPLC and GC-MS profiling of the extract also confirmed the presence of phenolic compounds. A novel protocol was designed and standardized for the chromatographic separation of a phenolic compound from the extract. The characterization of the compound revealed that the compound was bis (2-6, 7-diamino-5, 8-dioxo naphthalene-1yl) propanal (m/z 244; m.p-195°C to 197°C at 760mm Hg). The purified compound further exhibited antibacterial and cytotoxic activities. Thus the highlight of the study is the detection, isolation and characterization of the bioactive compound, bis (2-6, 7-diamino-5, 8-dioxo naphthalene-1yl) propanal, which incidentally is also the first report of the compound from the plant, *Eleutherine bulbosa*.

Keywords: *Eleutherine bulbosa* (Miller), pharmacognostic evaluation, bioactive, HPLC, bis (2-6, 7-diamino-5, 8-dioxo naphthalene-1yl) propanal.

Major Publication appeared in: Journal of Pharmacognosy and Phytochemistry

Total No. of Pages in the thesis: 175

Total No. of references cited in the thesis: 383

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Title: **“*In vitro* culture, elucidation of secondary metabolites and their therapeutic properties of *Marchantia linearis* Lehm & Lindenb. and *Marchantia polymorpha* L.”**

Researcher : Remya Krishnan

Guide : Dr. K. Murugan

Subject : Botany

Bryophytes are diverse, primitive nonvascular amphibious plants and form the second largest category of plants. Bryophytes posed lesser attention and not yet even properly documented. In this juncture, the present investigation was an attempt to unravel the biological potentials of the flavonoids from the *in vitro* cultures of the liverwort *Marchantia linearis* Lehm & Lindenb. compared with *M. polymorpha* L. The methodologies employed include analytical, biochemical and molecular. All the experiments were carried in triplicates and statistically evaluated. Initially, *in vivo* qualitative analysis of the different solvent extracts was attempted followed by quantitative analysis of major phytochemicals. FTIR and GC-MS analysis revealed the presence of varied phytochemicals. *In vitro* propagation protocol for *Marchantia* species was established through spore cultures by standardizing various culture parameters. Benzylaminopurine (BAP; 2 mg/L) and naphthalene acetic acid (NAA; 0.5 mg/L) were the successful hormonal combinations producing maximum callus regeneration. Subsequently, cell suspension cultures were established. Highest flavonoid production was achieved using 2,4-dichlorophenoxyacetic acid as growth regulator. Inoculum size, illumination intensity, organic carbon source, ferrous ion and elicitors are the major factors affecting flavonoid productivity. Flavonoids were further fractionated by thin layer chromatography revealed the presence of apigenin, quercetin, rutin, kaempferol and luteolin and were confirmed and quantified by HPLC-PAD analysis. Microbicidal potentiality by ELISA and disc diffusion method, cell membrane damage by electron microscopy, leakage of cell membrane by reducing sugar content, protein, nucleic acid, and efficacy of hydrolytic and respiratory enzymes were also evaluated. Remarkable antioxidant potentialities against free-radical (DPPH*, ABTS+, FRAP, H₂O₂ and ·OH) scavenging, iron chelating activity, scavenging of superoxide radicals and ORAC assay were noticed. DNA damage prevention induced by the free radical generated by Fenton reaction was also evaluated and was comparable with that of quercetin and other synthetic antioxidants. Antifeedant, larvicidal and pupicidal activities of flavonoids against *Spodoptera litura* larva and also their nutritional parameters such as ECI, ECD, AD and metabolic cost for the larvae were analyzed. As the last phase, antimetastatic property in terms of cytotoxicity in SW 480 cancer cell lines by MTT assay was evaluated. Signs of apoptosis were visualized in the HOECHST 33342 staining assay and were confirmed by scanning electron microscopy. Caspase activities and expression levels increased with dose and time. Thus, *Marchantia* species substantiate the folk knowledge of medicinal utility in terms of their secondary metabolites. Further works are warranted to purify the principle molecules in drug formulation for evaluating the diverse human ailments.

Keywords: Antioxidant, antimicrobial, anticancer, insecticidal potentiality, bryophytes, callus, *in vitro* culture, *Marchantia*, microbicidal, phytochemicals, cell cultures

Major publication appeared in : 3 Biotech, Springer & Indian Journal of Biotechnology

Total No of pages in the thesis: 227

Total No of references cited in the thesis: 322

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Title: “MORPHOLOGICAL AND MOLECULAR DELINEATION OF SELECTED SOLANUM L. SPECIES FROM KERALA”

Researcher: V. S. Anil Kumar

Guide: Dr. K. Murugan

Subject: Botany

Solanum is the largest genus in the Solanaceae family with more than 1500 species worldwide and in Kerala it is represented by ca. 32 species. Most of the species are exotic which became naturalised. There is high degree of phenotypic plasticity and great taxonomic ambiguity regarding the taxonomic status of many species. The present study attempts to investigate the macro and micro morphological analysis of 13 *Solanum* species, 1 subspecies, 1 variety and 2 accessions of a species. MVSP analysis was carried out with vegetative and floral traits and dendrograms as well as two dimensional scatterplots were evaluated for the taxonomic affinities among the taxa. Traits like stomatal index, palisade ratio, vein islet number and stomatal nature were also examined. The study reveals the presence of newer stomatal types in the genus like tetracytic, brachyparacytic and sharing of subsidiary cells by the guard cells of adjacent stomata. Scanning Electron Microscopic examinations of foliar trichomes, spermoderm sculpturing patterns and the exine sculpturing of pollen grains revealed significant features of taxonomic interest. Taxonomic keys have also been constructed using these traits. Further, the pollen traits were considered on an evolutionary perspective which draws a general conclusion of germ plasm evolution from wild to cultivar germplasm of *Solanum* species. Molecular studies employed RAPD and ISSR analysis and for these, two other common cultivars i.e., *S. melongena* “Neelima” and *S. tuberosum* were also considered and the genetic affinities were drawn from the constructed dendrograms and two dimensional scatterplots. Based on the attempted techniques, a new species of *Solanum* i.e., *Solanum exarmatum* has been reported from Southern Western Ghats. The trichomes, seed architecture patterns, trichome nature as well as the ISSR analysis—all are new records for *Solanum* species from Kerala. A thorough analysis of accessions of *Solanum torvum* from different geographical locations, showing morphological variations were also considered and significant variations were observed in the DNA and Protein banding patterns.

Keywords: *Solanum* L., Floral morphometry, Principal component analysis, RAPD, ISSR, Pollen morphology, Trichome nature.

Major Publication appeared in : Webbia: Journal of plant taxonomy and geography, Phytotaxa, Phytomorphology, World Journal of Pharmacy and Pharmaceutical Sciences, International Journal of applied biology and pharmaceutical technology

Total number of pages in the thesis: 211

Total number of reference cited in the thesis: 451

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Stream: Science & Technology

Subject: *Chemistry*

Title: “SYNTHETIC TRANSFORMATIONS OF PHYTOCHEMICALS FROM ZINGIBER ZERUMBET (L.) SMITH AND SYNTHESIS OF CARBOHYDRATE APPENDED ALKYLIDENE CYCLOPENTENES AS BIOACTIVE ANALOGUES”

Researcher: Ajish .K. R.

Guide: Dr. K. V. Radhakrishnan

Subject: Chemistry

Seven phytochemicals were isolated from the dried rhizomes of *Zingiber zerumbet* and one natural product was synthesized by alkaline hydrolysis. All the eight compounds were screened against α -glucosidase enzyme, aldose reductase enzyme and protein glycation reaction inhibition assays. Kaempferol and kaempferol-3-O-methylether were found to be potent α -glucosidase, aldose reductase as well as protein glycation inhibitors. Moreover, we have developed two synthetic strategies for the derivatization of bioactive zerumbone isolated from the rhizome. Among the two, the first one was palladium and rhodium catalyzed regio- and diastereoselective 1,4-conjugate addition using boronic acids and the second one was regioselective palladium catalyzed decarboxylative coupling reaction using arene carboxylic acids. Preliminary in vitro analysis revealed that most of the newly synthesised derivatives are potent α -glucosidase enzyme inhibitors. Finally we have developed a new and efficient route towards the synthesis of glycohydrids having an alkylidene cyclopentene moiety with triazole ring as a liker. The protocol involves a palladium catalyzed ring opening reaction and click chemistry as the key steps. The sugars used in the synthesis glycohydrids are glucose, mannose and galactose. Out of the six compounds synthesized, four were screened against α -glucosidase, α -amylase and protein glycation reaction inhibition assays. It is noteworthy that four compounds were found to be non-cytotoxic against H9c2 cardiac myoblast cell lines by MTT assay.

Key Words: Zingiber Zerumbet, Phytochemicals, Zerumbone, Palladium, Rhodium, alkylidene cyclopentene, α -glucosidase, aldose reductase, Protein glycation, α -amylase

Major publications appeared in: Synthesis, Tetrahedron Letters and Natural product Research

Total no. of pages in the thesis:177

Total no. of references cited in the thesis: 144

Email of Researcher: ajishragh@gmail.com

Title: “FUNCTIONAL MATERIALS FOR ELECTROCHEMICAL SENSING AND CONTROLLED DRUG RELEASE STUDIES”

Researcher: Aneesh .P .K

Guide: Dr. T. Prasada Rao

Subject: Chemistry

Co-Guide): Dr. A. Ajayaghosh

This thesis gives an idea about new “rising star materials” such as atomic clusters and graphene. The idea of chemical sensor and its advantages over other class of sensors giving focus onto electrochemical sensors. Electrochemical applications of atomic clusters and graphene for the development of modified electrodes and its applications for the development of electrochemical sensors for environmentally and clinically relevant trace metals and biomolecules. Development of cetyl trimethyl ammonium bromide (CTAB) stabilized gold atomic clusters-chitosan nanocomposite film modified polycrystalline gold electrode for the ultra-trace determination of mercury (II) ions using differential pulse voltammetric techniques. Anionic surfactant (SDS) stabilized palladium atomic clusters (PdAC-GCE) was synthesized by a novel potentiodynamic deposition method on to glassy carbon electrode and was applied for indirect differential pulse cathodic stripping voltammetric determination of biologically relevant glutathione molecule. To gain a better understanding of such an excellent sensor performance achieved with this electrode, studies were undertaken to pinpoint electrode kinetics of charge transfer processes. Furthermore the thesis describes a partially reduced graphene oxide nanosheet modified glassy carbon electrode, based upon the electrochemical reduction of exfoliated graphite oxide obtained from chemically formed graphite oxide and was used for the individual and simultaneous voltammetric detection and quantification of AA, DA and UA. This work provides a promising strategy for the individual & simultaneous determination of AA, DA & UA in the presence of other co-existing species in biological fluids. A brief outline of Metal-based drugs and its therapeutic applications in day to day life and the necessity of a delivery system for controlled and site specific release of metal based drugs and few developments in this area was described in the thesis. Lanthanum carbonate crystals incorporated chitosan microparticles (LCCM) are proposed for the collection of phosphate from 0.9% saline and human serum samples was explained in the thesis.

Major publications appeared in: Phys. Chem. Chem. Phys.; Anal. Methods; React. & Funct. Polym.

Total no. of pages in the thesis: 182

Total No. of reference cited in the thesis: 390

Email of Researcher: aneeshpadamadathil@gmail.com

Title: “DEVELOPMENT OF ELECTROCATALYTIC WO₃ BASED COMPOSITES AND COATINGS FOR HYDROGEN GENERATION”	
Researcher: Anupama V. Raj.	Guide: Dr. S. M. A. Shibli
Subject: Chemistry	
<p>The development of an alternate renewable energy source to fossil fuels is considered as one of the most important challenges for the scientific community at present. Hydrogen is considered as a versatile, efficient and promising alternate green energy carrier which could be produced by the electrolysis of water. Numerous attempts have been made to develop efficient and durable electrocatalyst for hydrogen evolution reaction (HER) in alkaline solutions. The HER electrocatalyst should be able to reduce the overpotential and consequently improve the electrochemical efficiency of the process. Owing to the relatively high catalytic activity and low cost, nickel based alloys and composites have long been recognized as the potential electrode materials for HER. The present work focused on improving the electrocatalytic activity and stability of Ni-P coating on mild steel substrate by incorporating tungsten based transition metal oxides, so that the resultant coating could be considered as better candidate for HER. The basic objective of the present study was to evaluate the role of monoclinic phased nano WO₃ as a suitable catalyst support material with the catalytic nickel in Ni-P coating for electrocatalytic HER. The coatings that are to be used for technological and industrial HER applications are expected to withstand high current density and the reverse polarization conditions. Catalytic composite of nano TiO₂ tuned with nano WO₃ possessing an enhanced surface area has been synthesised and synergistic interaction of hypo-d nano WO₃-TiO₂ catalytic composite with hyper-d nickel catalyst in the Ni-P matrix has been explored. The physical stability, sustained catalytic activity and long term stability of the coatings under dynamic experimental conditions in the highly aggressive alkaline environment has been studied. Stability with a special emphasis on tolerance of the coating to withstand reverse polarization conditions and high current densities has been analyzed. Having satisfied the essential features required by a coating for the purpose of technological and industrial applications, the developed composite coatings could be considered as an efficient electrode material for HER.</p>	
Major publications appeared in: Surface & Coatings Technology, RSC Advances Total no. of pages in thesis: 186 Total no. of reference cited in the thesis: 252 Email of researcher: anujayakrishnan17@gmail.com	

Title: “SYNTHESIS, CHARACTERIZATION AND BIOLOGICAL EVALUATION OF NOVEL NANOPARTICULATE DRUG DELIVERY SYSTEMS FOR COLON CANCER”

Researcher: Ashwani kumar .N

Guide : Dr. G. S. Vinod kumar

Subject : Chemistry

The pH sensitivity of the polymeric drug delivery vehicle is an inevitable factor in the field of oral Drug Delivery Systems (DDS) in the treatment of colon cancer. Even though 5-Fluorouracil (5-FU) was proved to be the most effective drug employed for the treatment of colon cancer; the inefficacy is due to several factors such as short biological half-life, poor absorption due to dihydropyrimidine dehydrogenase enzyme etc. In the first phase of the work a pH sensitive polymer (MAEHA) was synthesised as a capsule coating material for colonic delivery and its nano formulation as a DDS to 5-FU. We have investigated RADA-F6, the modification of the well known RADA-16 peptide at the 6th position by phenylalanine. The study shows that the RADA-F6 peptide with pH responsive self-assembling nature can be effectively used as a drug delivery system for the sustained release of a potent anticancer drug 5-FU at basic pH. In the next phase a phenylalanine (Phe) containing self assembling peptide nanofibrous material (RATEA-F8) for the drug delivery of 5-Fluorouracil (5-FU) and Leucovorin (LV) was developed. In the last phase we have synthesised a random copolymer of Poly-lactic-co-glycolic acid (PLGA)-*graft*-Branched Polyethylenimine (BPEI) [*PBP*] and used it as a multi DDS for 5-FU and Methotrexate (MTX). In conclusion, we have developed different nanoparticulate drug delivery systems comprising of polypeptide based biomaterials, Polymeric nanomicelles and methacrylic based nanogel (MAEHA) for the controlled delivery of 5-FU to treat colon cancer. The polymer MAEHA shows considerable pH sensitivity and it can be used as a coating material for the capsule. The coated capsule filled with the synthesised nanomaterials can be used as a new therapeutic system as an oral drug delivery system for colon cancer

Major Publication appeared in *Colloids and Surfaces B: Biointerfaces*, *RSC Advances* and *International Journal of Nanomedicine*

Total number of pages in the thesis: 155

Total number of references cited: 140

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Title: “Spectroscopic Investigations of Certain Pyrazine Carboxamides and Benzoxazole Derivatives”

Researcher: Bhagyasree .J .B

Guide: Dr. Jadu Samuel

Subject: Chemistry

Co-Guide: Dr. C. Yohannan Panicker

Benzoxazole derivatives got different kinds of biological activity in living systems. They shown low toxicity in warm-blooded animals. The diazine rings are building blocks of many important natural and synthetic compounds, e.g., nucleotides. For the investigations I selected five benzoxazole and one pyrazine carboxamide derivative. In the present work computational as well as spectroscopic calculations are used for the investigation of structure and properties of molecules. Theoretical Calculations were done using Gaussian09 program (B3LYP/SDD basis set). NBO calculations by NBO 3.1 program (DFT/B3LYP level), PED by GAR2PED program, MEP, FMO by Gaussian09 program (B3LYP/6-31G*). The Stuttgart/Dresden effective core potential basis set (SDD) was chosen particularly because of its advantage of doing faster calculations with relatively better accuracy. Imaginary wavenumbers were absent - confirms that the structures deduced corresponds to minimum energy. NBO analysis gives the stabilization properties of the compounds in terms of various orbital interactions. The energies, degrees of hybridization, populations of the lone electron pairs, energies of their interaction with the anti-bonding π^* orbitals, electron density (ED) distributions and E (2) energies have been calculated by NBO analysis. The calculated first and second order hyperpolarizability predicts that the molecules are highly polarized and the intra-molecular charge transfer possible and is make it as an attractive object for future studies of nonlinear optics. The HOMO-LUMO energy gap reveals the stability index of compounds. It is seen that the chemical potential of the all compounds are negative and it means that the compounds are stable. MEP predicts the most reactive part in the molecule. A comparative study of the important results obtained for the different derivatives and the possible direction for further elaboration of the study.

Major publications appeared in: Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, J.Mol.Structure.

Total no. of pages in the thesis: 294

Total no. of reference cited in the thesis: 271

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Thesis title: **“PROCESSING AND CHARACTERISATION OF ELECTROLESS COPPER AND NICKEL BORIDE COATING ON BORON CARBIDE FOR COMPOSITE SYNTHESIS”**

Researcher : Deepa .J .P

Guides: Dr. T .P .D .Rajan

Subject: Chemistry

Co-Guide: Dr. C. Pavithran

In the present work boron carbide particles has been incorporated in aluminium metal matrix and over aluminium substrate to improve the structural shielding and functional applicability of boron carbide. Boron carbide possesses high neutron absorption cross section, better mechanical properties, thermal stability and chemical inertness along with high hardness. During composite synthesis, the lower wettability and interfacial reactions lower the structural and functional applicability of boron carbide. In the first and second part of the thesis the effect of surface treatment and reaction parameters on forming uniform electroless copper and nickel boride coating over boron carbide particles was studied. The study showed uniform surface morphology of electroless copper and nickel boride coating growth over boron carbide particles at pH 12 and pH 8 respectively. The third part of the thesis deals with the developed electroless boron carbide and ceria co-deposited nickel boride composite coating on AA6061 and LM13 substrates. The study showed improvement in corrosion and wear factors with decreases in particle size and particle dispersion in coating bath. In the fourth part of the study the electroless metal coated boron carbide reinforced aluminium matrix composites by liquid metal stir casting and solid state powder metallurgy technique. The synergistic effect of better bonding, dispersibility, reduction in the grain size and precipitation hardening on the incorporation of electroless copper and nickel boride coating over boron carbide particles to aluminium matrix were observed through an increase in density and thermo-mechanical properties of the composite.

Keywords : boron carbide, electroless coating, surface treatment, composite coating, liquid metal stir casting, solid state powder metallurgy.

Major publications appeared in: *Applied Surface Science, Trans Ind. Inst. Metals, Materials Science Forum, Surface & Coatings Technology and Surface Engineering*

Total no of pages in the thesis: 203

Total no of references cited in the thesis: 209

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Title: “Investigation on Phthalonitrile Polymers and their Composites”	
Researcher : Dhanya Augustine	Guide : Dr. C. P. Reghunadhan Nair
Subject : Chemistry	
<p>Phthalonitrile polymers are considered as potential candidates as matrices for high temperature performing composites widely used for the technologically advanced areas of aerospace and aircrafts. However their application horizon is limited mainly because of their inherent brittleness coupled with their prolonged duration of cure at elevated temperatures. The current study focused on methods to overcome these limitations and realize self-curable, high performance phthalonitrile systems and their blends having optimum characteristics. For this, structural modifications of phthalonitrile backbones were tried to accomplish built-in catalysts as a part of the chain which is generally remarked, have a better chance for effective catalysis. Amine and phenol containing groups were incorporated into the chain for achieving self-curing oligomers. Alternatively, other co-reactants like propargyl ether, cyanate, epoxy etc were explored for their impact on the cure characteristics of phthalonitrile with a view to evolve phthalonitrile based systems with low temperature processability and without compromising thermal stability and mechanical characteristics. These systems are also not exempted from issue of brittleness. The brittleness can be reduced by means of altering the backbone or by blending with reactive or non-reactive toughening agents. The study has also investigated the impact of nanomodification on the cure behaviour and thermal stability of phthalonitrile resins.</p> <p>Keywords : Phthalonitrile polymers, thermoset, phthalocyanine, triazine, isoindoline</p>	
Major publication appeared in: <i>Polymer</i>	
Total no.of pages in the thesis: 247	
Total no. of references cited in the thesis: 260	
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Title: **“FERRITE MODIFIED GLASSY CARBON ELECTRODE FOR THE SELECTIVE DETECTION OF ACETAMINOPHEN”**

Researcher: Divya Jayan

Guide: Dr. Anitha Kumary .V

Subject: Chemistry

The two terms ‘Nanoscience and Nanotechnology’ has been synonyms with material science now-a-days. Nanomaterials exhibit significant physical, chemical and electronic properties which differentiate them from the bulk. Among the nanomaterials, nano metal oxides have received considerable attention because of their potential applications in areas such as semiconductors, catalytic materials, ceramics, electrochemical sensors and biosensors. The use of nanoparticles as sensors having significant catalytic properties can bring forth reduction in overpotential and also able to convert irreversible system into reversible one with substantial enhancement in peak currents. The immobilization of metal oxide nanoparticles on the surface of electrodes provide a high conducting surface which helps in the smooth detection of biomolecules. The present work thus describes the synthesis and characterization of cobalt ferrite and nickel doped cobalt ferrite nanoparticles and its application as a novel electrochemical sensor for the detection of one of the most popular drug acetaminophen. Acetaminophen (Paracetamol) is highly effective against fever, cold and pain including muscular ache, head ache, arthritis etc. Glassy carbon electrode modified with ferrite nanoparticles proved to be excellent platform for sensing the biomolecule and the doping of nickel ions on the ferrite nanoparticles improved the performance significantly. Additionally, the sensor showed excellent results for the simultaneous detection of compounds like dopamine, ascorbic acid and acetaminophen. The effects of different interfering compounds like urea, glycine, and glucose were tested and the sensor proved to be highly effective towards the detection of acetaminophen. The developed sensor is thus notable for its selectivity, reproducibility, detection limits at the nanoscale, ease of modification, simplicity and low cost and can be effectively employed to real systems.

Major publication appeared in: Journal of Solid State Electrochemistry,

International Journal of Electrochemical Science

Total no. of pages in the thesis: 207

Total No. of reference cited in the thesis: 308

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Title: “NOVEL AZA-BODIPY DYES AND STUDY OF THEIR PHOTOPHYSICAL, PHOTODYNAMIC AND MOLECULAR RECOGNITION PROPERTIES”

Researcher: Adarsh .N

Guide: Dr. D. Ramaiah

Subject: Chemistry

The aza-BODIPY dyes, an unexplored class of organic molecules, showed *ca.* 100 nm bathochromic shifted absorption in the NIR region, compared to the widely explored BODIPY dyes. We synthesized novel aza-BODIPY dyes having different functional groups and have investigated their properties such as singlet oxygen generation, as sensitizers in photodynamic therapy, photooxygenation as well as molecular recognition applications. We have synthesized a series of novel aza-BODIPY dyes and studied their photophysical properties under different conditions. Interestingly, the triplet excited states as well as singlet oxygen generation efficiencies of these dyes can be successfully tuned from around *ca.* 1% to 86% through proper substitution of heavy atoms such as bromine and iodine atoms. Further, we have investigated the photodynamic therapeutic applications of the formulated nanomicelles *in vitro*, which suggest that these conjugates showed negligible dark toxicity but exhibited high toxicity in light with an IC₅₀ value of 2 μM. In addition to PDT, for the first time, we explored the use of the aza-BODIPY derivatives as catalysts for green photooxygenation reactions. Furthermore, we have synthesized a few functional aza-BODIPY dyes and tuned their photophysical properties and molecular recognition applications such as the detection of nitrite ions and hydrogen sulphide in aqueous medium. In summary, we have synthesized novel aza-BODIPY dyes and tuned their photophysical properties such as NIR absorption, intersystem crossing and singlet oxygen generation efficiency by the judicious functionalization and thereby explored their versatile applications in photodynamic therapy, photooxygenation and molecular recognition.

Major publications appeared in: *Organic Letters, Chemistry-A European Journal, Analytical Chemistry, Organic and Biomolecular Chemistry*; Patent No. (Filed & Accepted): WO2014/115176, 2014

Total no. of pages in the thesis: 196

Total no. of references cited in the thesis: 194

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Title : **“DESIGN, SYNTHESIS AND STUDY OF PHOTOPHYSICAL AND SELF-ASSEMBLING PROPERTIES OF SOME C₃- SYMMETRIC DONOR-ACCEPTOR MOLECULES”**

Researcher: Deepak D. Prabhu

Guide: Dr. Suresh Das

Subject: Organic Chemistry

In recent years there has been a significant interest in developing liquid crystals and low molecular weight organogels based on disc shaped or C₃- symmetric molecules. Because of their shape anisotropy, these molecules usually tend to self-organize into a one dimensional columnar arrangement which imparts them with unique functional properties such as the ability to efficiently conduct charge and energy in a highly anisotropic manner making them useful materials as conducting molecular wires for a variety of applications. In the present thesis we have developed some novel 1, 3, 4-oxadiazole based donor-acceptor C₃- symmetric molecules possessing different alkyl chain lengths and studied their influence on the photophysical and self-assembling properties in solution as well as in the bulk state. We have also developed some C₃-symmetric molecules with increased donor-acceptor strength by introducing thiophene and triphenylamine chromophores. Interestingly we found that these molecules self-assembles in different solvents resulting in the formation of organogels with different optical properties. Detailed photophysical studies in the solution and solid state revealed a difference in the interaction of solvent molecules with the gelator molecules resulting in the preferential formation of particular type of aggregate which in turn resulted in different optical properties in solution and solid state.

Major publication appeared in: J. Phys. Chem. B 2012, 116, 13071 and J. Mater. Chem. C, 2014, 2, 7039

Total number of pages in the thesis: 147

Total number of reference cited in the thesis: 191

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Title: “CARBON-CARBON AND CARBON-HETEROATOM BOND FORMATION VIA TRANSITION METAL CATALYZED DESYMMETRIZATION OF STRAINED DIAZANORBORNENES”

Researcher: jijy .E

Guide: Dr. K. V. Radhakrishnan

Subject: Chemistry

Transition metal catalyzed synthetic transformations play significant role in the construction of carbon-carbon and carbon-heteroatom bonds. Desymmetrization of strained bicyclic alkenes, including oxa-, aza-, and diazanorbornenes/norbornadienes, by employing transition metal catalysts has garnered tremendous attention among synthetic chemists. The unique geometry of the bicyclic systems makes them susceptible towards face selective activation by transition metal complexes. In this way, desymmetrization of diazanorbornenes has paved way for the construction of important carbocycles and heterocycles. The topic of research that embodies my doctoral thesis deals with the transition metal catalyzed transformation of strained diazanorbornenes towards the synthesis of cyclopentenes and cyclopentannulated heterocycles. The strained diazanorbornenes possess different modes of reactivity like electrophilic addition to the double bond, N-N bond cleavage, allylic fragmentation *etc.* Utilizing these reactivity patterns we have described a palladium catalyzed carboannulation of *o*-iodostyrenes with diazabicyclic olefins towards the synthesis of functionalized indanes. Variety of functional groups such as esters, ketone and nitrile as substituents on the iodostyrenes well tolerated the reaction, which explains the synthetic potential of the product for further transformations. Considering the biological importance of spiro[2.4]heptenes we have carried out the palladium catalyzed ring opening of spirotricyclic olefins with soft nucleophiles such as phenols and malonates. The strategy provides a facile route for the synthesis of functionalized spiro[2.4]heptenes under mild reaction conditions. The synthetic utility of the described compounds is emphasized by the preparation of corresponding iodolactone derivatives. Cyclopentannulated chromanone derivatives were synthesized through the direct oxidative coupling of salicylaldehydes with diazabicyclic olefins in presence of Rh/Cu catalyst system. This is the first report on the ring opening-ring closing of bicyclic olefins *via* metal catalyzed oxidative coupling reaction. We have also achieved the desymmetrization of diazabicyclic olefins by C-H bond functionalization of aromatic compounds having no pre-functionalization in an atom-economical way. We developed a Rh(III) catalyzed desymmetrization of strained olefins through C-H activation of *O*-acetyl ketoximes to access biologically important *trans*-difunctionalized cyclopentenes and spiro[2.4]heptenes. In conclusion, we were able to develop strategies to synthesize chromanone fused cyclopentenes, indane fused azabicycles, azatricycles, spiro[2.4]heptenes and functionalized cyclopentenes, with multiple points for further derivatization.

Keywords: Desymmetrization, Diazanorbornenes, palladium, rhodium, cyclopentenes

Major publications appeared in: *Chemical Communications, Tetrahedron Letters, Synthesis (2 Nos).*

Total no. of pages in the thesis: 181

Total no. of references cited in the thesis: 147

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Title: “Removal of selected toxic heavy metals from aqueous solutions by biosorption and phytoremediation”

Researcher: Saumya S. Pillai

Guide: Dr. Mathew Koshy

Subject: Chemistry

The present study is focused on the removal of toxic heavy metals such as Hg(II), Pb(II), Cd(II) and Cr(VI) from aqueous solutions by the method of biosorption and also on the evaluation of the influence of organic manure on phytoremediation of chromium. For the biosorption study, two biosorbents, viz. Xanthated Nano Banana Cellulose (XNBC) and chemically modified Potato Starch (CPS) were prepared. Characterisations of biosorbents were done by using techniques such as Fourier Transform Infrared spectroscopy, X-ray diffraction, Thermo Gravimetry, Scanning Electron Microscopy, Energy Dispersive X-ray Spectroscopy and X-ray Fluorescence analysis. The effect of various parameters such as pH, initial concentration, contact time, amount of biosorbent and agitation time on the extent of biosorption was also studied. From the data, biosorption isotherm studies, kinetic and thermodynamic parameters were evaluated. Desorption study of each metal ion was done by using suitable desorbing agents. Present studies evidently indicate that xanthated nano banana cellulose (XNBC) and chemically modified potato starch (CPS) can be used as competent agents for the successful biosorption of toxic heavy metals such as mercury, lead, cadmium and chromium from aqueous solutions. On comparison, XNBC proved to be a more efficient biosorbent than CPS. Phytoremediation study was conducted by using the ‘miracle plant’, *Vetiveria zizanioides*. It was found to be an effective method for the removal of chromium from soil amended with organic manure.

Keywords: Biosorption, metal ions, Xanthated nano banana cellulose, chemically modified potato starch, phytoremediation, *Vetiveria zizanioides*

Major publications appeared in: 1) *Ecotoxicology and Environmental Safety*, 98 (2013), 352–360 2) *Ecotoxicology and Environmental Safety*, 92 (2013), 199-205
3) *Chemistry and Ecology*, Vol. 29, No. 3 (2012), 270–279

Total No. of pages in the thesis: 167

Total No. of reference cited in the thesis: 421

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Title: **“SYNTHESIS OF CYCLOPHANES AND INVESTIGATION OF THEIR INTERACTIONS WITH BIOMOLECULES AND VOLATILE ORGANIC COMPOUNDS”**

Researcher: Nandajan .P .C

Guide: Dr. D. Ramaiah

Subject: Chemistry

Molecular recognition, fundamental to biological process inspired scientists for the development of areas, ‘host-guest’ and ‘supramolecular’ chemistry. Herein we report the synthesis, photophysical and molecular recognition properties of the selected cyclophanes. We synthesized a few cyclophanes having varied aromatic surface, bridging groups and cavity size and examined their biomolecular recognition properties. With the use of Fluorescence Indicator Displacement (FID) Assay, we could achieve the selective recognition of 5'-GTP and 5'-ATP. These results demonstrate the role of the aromatic surface and bridging groups in the biomolecular recognition properties of the cyclophanes. The investigation on the selected cyclophanes showed that these systems have different photophysical properties under different media. The selected system exhibited monomer emission in methanol and formed intra-molecular excimer in aqueous medium. The contrasting behavior of these systems in solid state were examined by crystal structure analysis and confirmed as the formation of inter-molecular excimer. The utility of these systems as probes for Volatile Organic Compounds (VOCs) were examined and revealed that the cyclophane can selectively detect the methanol vapor even from 1% methanol-ethanol mixture. The proper selection of various Cyclophane-Dye complexes for FID Assay can result in the selective recognition various biomolecules. In this regard, our results demonstrate that by properly changing the cyclophane-dye complexes, it is possible to develop systems that can be utilized to selective recognition of neurotransmitters in the aqueous medium. In summary, we have synthesized a few cyclophanes and investigated their photophysical properties under different conditions and explored their utility as host molecule for the recognition of biomolecules and VOCs.

Major publications appeared in: *Organic Letters*, *RSC Advances*, *Organic and Biomolecular Chemistry*.

Total no. of pages in the thesis: 200

Total no. of references cited in the thesis: 277

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Title: “MAGNETIC, DIELECTRIC AND SPIN-PHONON INTERACTIONS IN SOME RE₂NiMnO₆ (RE=RARE EARTH) DOUBLE PEROVSKITES”

Researcher: Neenu Lekshmi .P | Guide: Dr. Manoj Raama Varma, Dr. C. H Suresh

Subject: Chemistry

The thesis describes a detailed investigation of the structure, magnetic, DC transport, dielectric, magneto-dielectric and spin-phonon interactions in RE₂NiMnO₆ (RE=La, Pr, Nd, Sm, Gd and Tb). One of the main interests for choosing RE₂NiMnO₆ is that the RE ion is known to modify the functional properties of the compound which will provide scope for fundamental research for the development of functional materials. All the synthesized compounds have monoclinic structure and the properties show strong structural correlation. The thermomagnetic analysis confirms competing magnetic interactions in RE₂NiMnO₆ in which the antisite disorder, as a result of partially disordered Ni²⁺/Mn⁴⁺ ions, play a prominent role. Moreover, the presence of heavier RE ions also provide attractive magnetic features. Detailed analysis of DC conductivity and dielectric relaxation in RE₂NiMnO₆ confirms the presence of polarons. The magnetodielectric (MD) studies were done on RE₂NiMnO₆, and the La₂NiMnO₆ shows a colossal MD effect (10%-50%) over a broad range of temperatures (100–280 K). The MD coupling of RE₂NiMnO₆ was found to be reduced on moving from La to Tb. The observed MD effect in RE₂NiMnO₆ signals the influence of spin orientations in the two magnetic sublattices on the spin-lattice coupling. However, from Raman spectroscopy, we clarify that the observed MD effect in RE₂NiMnO₆ is due to the strong coupling between charge and spin degrees of freedom rather than spin-phonon coupling. Thus, the present work offers better understanding of the inherent interactions in RE₂NiMnO₆ which will provide essential knowledge for the intelligent design and synthesis of novel and useful functional materials.

Major publication appeared in: Journal of Materials Chemistry C (RSC)

Total No. of pages in the thesis: 198

Total No. of reference cited in the thesis: 243

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Title: “METAL COMPLEXES OF HETEROCYCLIC SCHIFF BASES”	
Researcher: Nisha .V.P	Guide: Dr. K. Mohanan
Subject: Chemistry	
<p>This work is concerned with the synthesis, spectroscopic characterization, thermal decomposition, XRD, fluorescence studies, antimicrobial, DNA cleavage and corrosion inhibitory activities of some transition and inner transition complexes of three different heterocyclic Schiff bases viz N-(2-thiophenylmethylene)-2-aminobenzoic acid, 2-[N-(2-hydroxy-1-naphthylidene) amino] pyrimidine and N-(2-pyrrolemethylene)-2-aminobenzoic acid. These ligands and their complexes have been characterized through elemental analysis, molar conductance, magnetic moment, UV-Vis., IR, NMR and mass spectral data. On the basis of these studies, suitable structures have been proposed for the ligands and their metal complexes. The study also brings out the relevance and significance of the oxocation complexes by synthesis and characterization of oxovanadium(IV), oxozirconium(IV) and dioxomolybdenum(VI) complexes with the above mentioned three heterocyclic Schiff bases. Some selected lanthanide compounds have been subjected to X-ray diffraction and fluorescence studies. The thermal decomposition studies of iron(III) chloride complexes help to evaluate the kinetic parameters using Coats-Redfern equation. Apart from the kinetic parameters and thermal stability, suitable mechanisms have been proposed for their thermal decomposition. Since these ligands are Schiff bases of heterocyclic derivatives containing <i>N</i>, <i>S</i> and <i>O</i> donors they and their metal complexes have considerable antifungal, antibacterial and the DNA cleavage activities. The corrosion inhibition activities of the three ligands and their metal complexes are analysed. It is found Schiff bases possess higher corrosion inhibition efficiency and act as efficient inhibitors when compared to their metal complexes and also it is observed that the inhibition efficiency of the ligands increases with increase in concentration. The synthesis and characterization of lanthanum(III) complexes N-(2-thiophenylmethylene)-2-aminobenzoic acid), in presence of various counter anions highlight the important aspects of anion coordination. All these results of the investigation are expected to attract the interests of the chemists in the concerned field.</p>	
<p>Keywords: Schiff bases, oxocation complexes, X-ray diffraction, antimicrobial, DNA cleavage, corrosion inhibitory activities</p>	
<p>Major publication appeared in: Journal Indian Chemical Society. Total No of pages in the thesis:306 Total No of reference cited in thesis:313 Email of Researcher:vpnisha@gmail.com</p>	

Title: “Adsorption Performance of Surface Modified Clays for the Removal of Some Organic and Inorganic Pollutants from Aqueous Phase: Kinetic and Equilibrium studies”

Researcher: Ramachandran .M

Guide: Dr. T. S. Anirudhan

Subject: Chemistry

In the modern society, a primary environmental issue is the quality of surface water, sediments, ground water and drinking water. Clays have extensively been used as adsorbents for water purification due to their high cation exchange (CEC), swelling properties, and high surface areas. The natural porous structure offers a great potential for the retention of pollutants on the surface. Naturally occurring clays are ineffective for the adsorption of anionic contaminants, and hydrophobic or non-polar organic pollutants. This is due to the hydrophilic characteristics of their surfaces and charges. In this present study, the effectiveness of surface modification on synthetic bentonite clay was achieved by cation exchange reaction by using HDTMA cations. The organo- bentonite was prepared by adding a quantity of the HDTMA⁺ cations equal to twice the CEC of the Na-bentonite. The surface modified bentonite clay was further modified to polyacrylonitrile-amidoximated composite by in situ intercalation polymerization. The developed adsorbents were characterized using different chemical techniques. Batch adsorption studies were adopted for the removal of TA, HA, 2,4,6-TCP, basic dyes like MB, CV, RB using surfactant modified bentonite clay (organoclay) and inorganic pollutants like Cu(II), Zn(II), Cd(II) ions using amidoximated polyacrylonitrile bentonite. The adsorption techniques includes effect of pH, Ionic strength, effect of surface modification, Adsorption isotherm, adsorption kinetics, competitive adsorption isotherms, Removal of pollutants from simulated wastewater, desorption and regeneration of adsorbent. Thermodynamic and mass transfer analyses were carried out at different temperature and initial concentrations. The adsorption mechanism was explained using various models. The experimental results were analyzed using HYBRID error method and the potential of adsorbents were evaluated. The results obtained shows that developed adsorbents are very effective for removing organic and inorganic pollutants from aqueous phase.

Major publication appeared in: J.colloid and Interface science, Applied clay science & Industrial engineering chemistry Research.

Total number of pages in the thesis: 227

Total number of reference cited in the thesis: 381

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Title: “Development of Vanadium Oxide based Catalyst Incorporated Ni-P Coatings for Hydrogen Evolution Reaction.”

Researcher : Sajith .S

Guide : Dr. S. M. A. Shibli

Subject: Chemistry

Noble metals have been used as ideal electrocatalysts for hydrogen evolution reaction (HER) due to their high catalytic activity, low overpotential, and better electrochemical stability. Current research demand to decrease the overpotentials of electrode reactions and to select inexpensive electrode materials with good electrocatalytic activity for HER. In the present study, geometrical and the electronic factors of the standardized electroless Ni-P coatings on steel coupons were modified by incorporating with V_2O_5 . V_2O_5 possess several unique advantages such as low cost, less toxicity and high energy density. The layered structure of V_2O_5 and its redox properties are important for catalyzing surface reactions. The effect of V_2O_5 incorporation on the morphology and crystalline structure of electroless Ni-P coatings as well as the resulting electro-catalytic activity of the coatings for HER in alkaline solution was systematically investigated. In further part of the study, various mixed oxides of V_2O_5 such as $V_2O_5-Fe_2O_3$, $V_2O_5-TiO_2$, $V_2O_5-CeO_2$ and $V_2O_5-MnO_2$ were synthesized by thermal decomposition method and the synergistic catalytic effect of these mixed oxides in enhancing the electrocatalytic activity of the electroless Ni-P coating were investigated. The highest electrocatalytic activity and greater stability exhibited by $V_2O_5-MnO_2$ mixed oxide incorporated electroless coatings was then correlated with the mechanism of HER. Finally, the feasibility of the $V_2O_5-MnO_2$ mixed oxide incorporated electroless coatings for HER under industrial conditions was also studied. Methods for improving efficiency of the plating bath, minimizing the bath wastage, Greener plating methods and new electrocatalytic composite materials could be developed and explored for HER to fulfill new benefits and property.

Total no. of pages in the thesis : 229

Total no. of reference cited in the thesis : 309

Email of Researcher: sajiththattamala@gmail.com

Title: “Development and evaluation of TiO₂ based catalytic composite incorporated Ni-P coatings for electrochemical hydrogen generation”

Researcher: Sebeelamol .J .N

Guide: Dr. S. M. A. Shibli

Subject: Chemistry

Electrocatalysis is a process of enhancement of electrode kinetics by a suitable material by minimising the over potential. Hydrogen is considered as an ideal energy carrier that can be an alternative to fossil fuel. The high energy consumption of alkaline water electrolyzers' restraints their large scale application at present. Nickel exhibits a high initial electrocatalytic activity towards the HER. But it experiences extensive deactivation as a cathode during water electrolysis. Mixed transition metal oxide and their application have become an important research theme due to their unique, magnetic, electric, optical and catalytic properties which are distinctly different from those of pure bulk oxides.

The catalysts were characterised by different techniques including X-Ray Diffraction method (XRD), Transmission Electron Microscopy (TEM), Scanning Electron Microscope (SEM), Atomic Force Microscopy (AFM), Electrochemical Impedance Spectroscopy (EIS), Tafel techniques, Galvanostatic polarisation and open circuit potential (OCP) measurements. The incorporation of ZrO₂, Fe₂O₃, and CeO₂ generally increased the catalytic efficiency of TiO₂. All the electrodes generally exhibited high electrocatalytic activity, long life, reproducibility and reliability. The efficiency under aggressive conditions was found to be competent to the present reports. The present work explores the possible application of titania (TiO₂) based catalytic electrodes for HER.

Keywords: Electroless coating, electrocatalysis, electrochemical impedance spectroscopy, hydrogen evolution reaction

Major publication appeared in: International Journal of Hydrogen Energy

Total no: of pages in the thesis: 234

Total no of reference cited in the thesis: 307

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Title: **“Anti-inflammatory and anti-arthritic potentials of alginic acid isolated from Marine algae *Sargassum wightii* Greville.”**

Researcher: Saritha Kumari .C .H

Guide: Dr. G. Muraleedhara Kurup

Subject: Biochemistry

Seaweeds are a major group of plants in marine environment. *Sargassum wightii* is one of the important species belonging to the genus *Sargassum* with a wide range of bioactive properties. The *Sargassum* species, a brown warm water macroalgae with variously shaped plastids in each cell, is rich in carotenoids, fatty acids, phycobillins, vitamins, sterols, tocopherols and polysaccharides such as mannitol, cellulose, alginate, fucoidan, fucoxanthine, and laminaran. Marine polysaccharides are a vast resource of untapped potential and are finding more uses in the biotechnological and biopharmaceutical industries. Marine polysaccharides are a vast resource of untapped potential and are finding more uses in the biotechnological and biopharmaceutical industries. Rheumatoid arthritis (RA) is a chronic joint inflammatory disease that affects more than 1% of the general population which is more prevalent among women even in developed countries. Many chemical drugs used to treat rheumatoid arthritis have potentially serious side effects. Recently natural drugs are used, which include plant source and marine sources. So in this work, different marine brown algae were screened for their anti-inflammatory and antioxidant potentials. Dose dependent study of alginic acid from different brown algae was carried out. Alginic acid extracted from *Sargassum wightii* showed maximum anti inflammatory and anti oxidant activity which was used for the study. In summary bioactive potentials of *Sargassum* species collected from Kerala was evaluated and was found to possess good antioxidant capacities along with found to have good antioxidant capacities with anti inflammatory property.

Keywords: *Sargassum wightii*, Arthritis, alginic acid, Anti –inflammatory, Anti –oxidant.

Journals in which major publications appeared in: Inflammopharmacology, International Immunopharmacology, comparative clinical pathology.

Total number of pages in thesis: 151

Total number of reference cited in the thesis:295

Email:sarihatvm2008@gmail.com

Title: “**Synthesis and Characterization of Metal Nanoparticles using *Anacardium Occidentale***”

Researcher: Shenya .D .S

Subject: Chemistry

Guide: Dr. Joseph Mathew

Environmentally benign methods for the synthesis of nanomaterials are highly desirable in nanoscience as it eliminates the use of toxic chemicals. This thesis is an account of the work on the green synthesis and characterization of nanoparticles (NPs) of gold, silver, palladium, platinum and bimetallic nanoparticles of gold and silver using *Anacardium occidentale*. Highly crystalline and spherical NPs of Au, Ag and Pd are prepared using leaf powder while hexagonal Au NPs are obtained using the essential oils present in the leaves of *A.occidentale*. FTIR spectral studies reveal that all these metal NPs are stabilized by different protein chains present in leaf powder. The dependence of quantity of extract, temperature and pH on the size of gold and silver NPs have been investigated. Most of the synthesized NPs show good catalytic activity and enhancement in thermal conductivity. The use of environmentally benign plant material offers benefits of ecofriendliness and these samples are suitable for biomedical and pharmaceutical applications, in addition to the applications as nanocatalysts and nanofluids.

Keywords: *Anacardium occidentale* leaf, biosynthesis, gold nanoparticles, silver nanoparticles, Au-Ag bimetallic nanoparticles, Pd nanoparticles, Pt nanoparticles

Title: “Studies on Metal Aminobenzoates, Nitrobenzoates, Cinnamates and Hippurates”

Researcher: Sunalya M. Roy

Guide: Dr. M. R. Sudarsanakumar

Subject: Chemistry

This work deals with the crystal growth and characterization of metal complexes using different ligands. The crystal growth method used was gel growth method. This growth method is a simple technique through which polymeric metal complexes could be grown. Polymeric metal complexes were also considered as metal-organic frameworks. Metal-organic frameworks are very important in the present scenario owing to their applications in various fields such as gas storage and separation, drug delivery, catalysis, adsorption, luminescence etc. The ligands selected for the present study include 2-aminobenzoic acid, 4-aminobenzoic acid, 3-nitrobenzoic acid, 4-nitrobenzoic acid, cinnamic acid and hippuric acid. The grown metal complexes were characterized using different spectral and thermal techniques. Fluorescent spectral studies were carried out in the case of some complexes. NLO activity studies of metal cinnamates and hippurates were conducted owing to the ligand characteristics. Cadmium cinnamate showed excellent NLO activity. Metal complexes of 4-nitrobenzoic acid and hippuric acid showed antibacterial and antifungal properties. DNA cleavage activity of certain complexes was also investigated.

Major publication appeared in: *Inorganic Chemistry Communications*

Total no. of pages in the thesis: 236

Total no. of reference cited in the thesis: 254

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Stream: Science & Technology
Subject: *Dentistry*

Title- “Efficacy of photodynamic therapy in the management of chronic localized periodontitis in terms of clinical attachment level, fluorescence spectrum and periodontopathogenic bacterial counts - A randomized controlled single blinded clinical trial”

Researcher: Dr. Betsy Joseph	Guide: Dr. Presanthila Janam
Subject: Dentistry	Co-Guide: Dr. N. Subhash

Antimicrobial photodynamic therapy (aPDT) is an evolving treatment modality where light of a particular wavelength is used to excite a specific photosensitizer (PS) that mediates bacterial destruction. In the present research work, efficacy of aPDT in the management of chronic localized periodontitis is investigated in 90 patients for the first time in our population in a single-centred randomized and controlled clinical trial. Clinical parameters, patient- based outcomes and colony forming units of certain periodontopathogens were evaluated for 6 months after treatment. Results show statistically significant improvement and short-term benefits in terms of these parameters in the test group as compared to control group and therefore can be proposed as an adjunct to conventional scaling and root planning in order to improve treatment results of chronic periodontitis. Furthermore, for the first time, 404nm diode laser excited LIAF spectra recorded in situ from dental plaque (0-3 grades of Plaque Index) accumulated on tooth surface was used to evaluate the diagnostic accuracy of discrimination between various grades of plaque from the area under the receiver operating characteristics. It was found that clinically invisible plaque can be identified with good diagnostic accuracy using diagnostic algorithm developed based on fluorescence spectral intensity ratio (F510/F630).The clinical significance of this study is that the technique presented here can be further developed for clinicians to precisely identify minute amounts of plaque without the use of disclosing solutions and for patients in order to assess proper oral hygiene during homecare practices.

Major publication appeared in- Journal of Clinical Periodontology (2014), Journal of Biomedical Optics (2015)

Total number of pages in the thesis- 189

Total number of references in the thesis- 292

Email of the Researcher- jobets121@gmail.com

Title: “An evaluation of three prognostic biomarkers in the risk assessment of Leukoplakia.”

Researcher: Gigi Thomas	Guide: Dr. Ravindran Ankathil
Subject : Dentistry	Co-Guide: Dr. K. Nandakumar

Oral Squamous Cell Carcinoma, OSCC, is a major cause of global morbidity and mortality and is an important public health issue. Majority of squamous cell carcinoma in India arises from the malignant transformation of Oral Premalignant Disorders, OPMD, such as leukoplakia. The current study was designed to investigate the utility of three genomic markers, viz, DNA ploidy, telomerase activity and DNA repair capacity in oral leukoplakia and the findings were correlated with histopathological and clinical outcome. All the leukoplakia patients were followed up for a period of 9.5 years in order to detect the malignant transformation rate. For comparison of data, these three candidate genomic markers were investigated in OSCC patients and normal healthy individuals. There was a statistically significant difference in the distribution of ploidy status, telomerase activity and DNA repair capacity among control, leukoplakia and oral cancer group ($p=0.0001$). Highest aneuploidy status was found in oral cancer (66.3%), followed by leukoplakia (31.4%) and least among control (10.6%). Telomerase activity was detected in 100% of oral cancer group, 59.5% of leukoplakia arm while no subjects in the control arm showed telomerase positivity. Chromosome hypersensitivity to Bleomycin ($p=0.0001$) was more pronounced in oral cancer (66%), followed by leukoplakia (22%). While none of the subjects in the control arm showed hypersensitivity. In the univariate analysis using logistic regression, DNA repair capacity had the highest odds of assessing the malignant transformation risk among leukoplakia patients (OR 57.9, 95% CI 7.2-466.8) followed by DNA ploidy (OR 6.5 95% CI 1.9-22.8). Multivariate analysis using logistic regression analysis showed that DNA repair capacity was the most significant marker for the assessment of malignant transformation risk among leukoplakia patients (OR 52.9, 95% CI 6.56-426.7). The sensitivity and specificity analysis of independent markers and a combination of markers was also analyzed in the study. It was found that DNA repair capacity had the maximum sensitivity (91.7%) and specificity (84.2%) among all three markers when studied independently. When combination of markers was studied, it was found that the combination of DNA repair capacity and Telomerase had highest sensitivity (75%) and specificity (85.8%) when compared with the gold standard of histopathological evaluation. The total number of leukoplakia who underwent malignant transformation during the whole follow up period of 9.5 years was 14 (8%). Genomic markers combined with oral visual examination and histopathologic evaluation may help in more precise identification of OPMD cases who have propensity for malignant transformation. Hence, patients with precancers can be treated based on an individual approach. This may prevent progression of OPMD to malignancies thereby reducing the morbidity and mortality due to OSCC.

Keywords: OSCC, Leukoplakia, Genomic markers, Malignant transformation

Major publications appeared in: Journal of Indian Academy of Oral Medicine and Radiology.

Total number of pages in the thesis: 213

Total number of references cited in the thesis: 405

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Stream: Science & Technology
Subject: *Aquatic Biology and Fisheries*

Title: “ECOTOXICOLOGICAL STUDIES OF KUTTANAD WETLAND WITH SPECIAL REFERENCE TO BIO CONCENTRATION OF PESTICIDES IN *CHANNA STRIATUS* (BLOCH)”

Researcher: Jacob Chandy

Guide: Dr. Laly Jacob

Subject: Aquatic Biology and Fisheries

Wetland is a meeting point of aquatic life, wild life and people. Kuttanad is a large wetland ecosystem in Kerala, comprising of paddy fields, marshes, lakes and rivers. Surface water samples were collected for a period of two years from December 2010 to November 2012. Various physico- chemical and biological parameters like Salinity, Conductivity, Total hardness, TDS, DO, CO₂, Nitrate, Nitrite, Phosphate, Silicate, Calcium, Magnesium, Potassium, Chloride and Total coliform studied showing significant variations between seasons of the year in the rural and urban regions of Kuttanad. Two organophosphate pesticides namely Monocrotophos and Quinalphos, two synthetic pyrethroid pesticides namely Lambda-cyhalothrin and Fenvalerate and Methomyl belonging to carbamate group of pesticides, were selected for the study. Water samples, fish- *Channa striatus* and duck-*Anas platyrhynchos* (reared in the ecosystem) were directly collected during monsoon, pancha (rabi) and virippu (kharif) crop seasons, analysed for the presence of organophosphates and pyrethroid pesticides. Detectable levels of these pesticide residues were found in the aquatic medium of Kuttanad wetland. But the examination of the organs dissected out from *C. striatus* and *A. platyrhynchos*, revealed below detectable levels of the pesticides examined. LC₅₀ studies (96hrs.) were conducted in *C. striatus* for pesticides Lambda Cyhalothrin, Fenvalerate, and Methomyl. In the laboratory *C. striatus* were exposed to sub lethal concentrations of Monocrotophos, Quinalphos, Lambda Cyhalothrin and Fenvalerate for 21 days. Samples of gills, liver and muscles were collected and analysed for the presence of pesticide residues using standard procedures. The results revealed significant concentrations of these pesticide residues in all the samples tested. A field survey revealed an increase in cancer incidence and allergic conditions in the area. The study revealed the poor awareness among people regarding the harmful impacts of pesticides. Lack of proper knowledge about the protocols of pesticide application was also evident among the applicators.

Major Publication appeared in: *Proceedings of the International Conference on the impact of Climate change on food security* held at Bishop Moore College, Mavelikara from March 03rd to 5th 2011 sponsored by UGC, New Delhi and KSCSTE, Thiruvananthapuram.

Total no. of pages in the thesis: 327

Total no. of reference cited in the thesis: 583

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Title: “Hydrography of Kuttanad Wetland Ecosystem with special reference to Organophosphate pesticide pollution”

Researcher: Rajasree .K. M.

Guide: Dr. Laly Jacob

Subject: Aquatic biology and fisheries

Kuttanad, commonly known as the ‘rice bowl of Kerala,’ is located at the southern portion of India’s largest Ramsar site, the Vembanad- Kole Wetland and it is the only part of the world where rice is cultivated below the sea level. One of the major problem facing in Kuttanad is pollution due to various agrochemicals. The current study investigated the hydrography and Organophosphate Pesticide (OP) pollution in Kuttanad Wetland Ecosystem. In the hydrographical studies of Kuttanad –a comparison between Urban and Padasekharam areas were assessed. The physical parameters analyzed were temperature, pH, TDS and conductivity. Chemical parameters studied were salinity, dissolved O₂, dissolved CO₂, total hardness chloride and BOD. Nurients like nitrate-nitrogen, nitrite-nitrogen, phosphate-phosphorous and silicate-silicon and the biological parameter like the total coli form were also analyzed. Meteorological parameters analyzed were rainfall and atmospheric temperature. The results showed that salinity is the most fluctuating parameter in Kuttanad and most of the parameters were high in the Padasekharam areas compared to that of Urban areas. The results of total coliform showed that both Urban and Padasekharam areas were highly contaminated with coliform bacteria. *In situ* OP pesticide analysis of water samples in the Kuttanad Wetland Ecosystem, the presence of monocrotophos and ekalux were detected in both pre-monsoon and post-monsoon seasons. In fish and duck samples they were found to be below detectable levels. *In vivo* bioconcentration studies in *Channa striatus* showed that monocrotophos residues was higher in gills compared to that of flesh and liver at 1 ppm concentration. But ekalux residues highly accumulated in liver compared to that of gills and flesh at 0.025ppm. Along with bioconcentration studies morphological and behavioural changes were also investigated with pesticide intoxicated fishes. The study forwards various recommendations to uplift the deteriorating ecosystem and conserve the biodiversity.

Keywords: *Channa striatus*, hydrography, monocrotophos, ekalux, bioconcentration studies

Major publication appeared in : *Ind J. Multidisciplinary Research*

Total no. of pages in the thesis : 178

Total no. of references cited in the thesis : 351

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Title: “Trophic Modelling and Biodiversity Assessment of Veli-Akkulam Lake, Kerala”

Researcher: Regi .S .R

Guide: Dr. A. Bijukumar

Subject: Aquatic Biology and Fisheries

Aquatic ecosystems play important roles in providing services that directly or indirectly benefit humans. The biotic components of an aquatic ecosystem link each other through trophic interactions forming food chains and food webs. For proper ecosystem management, knowledge of species interrelationships within an ecosystem is a prerequisite. Ecosystem models allow for a better understanding of how species are influenced by each other and by human activities. The study was carried out in the Veli-Akkulam Lake, Kerala, a small coastal lake in the west coast of India, with the objectives of assessing the biodiversity of primary biotic components, constructing a mass-balanced Ecopath model of the lake for understanding its trophic structure and quantifying the trophic interactions taking place, and also to propose practical strategies and action plans for effective conservation and sustainable management of the lake. Significant spatiotemporal variations were observed in the distribution and abundance of all biotic components in the lake. More than half the area of the lake was affected by the uncontrolled spread of the exotic water hyacinth *Eichhornia crassipes*. The pollution, silting, and macrophyte proliferation have led to the deterioration of the general health of the lake ecosystem. The exotic tilapia, *Oreochromis mossambicus* was the most dominant fish species in the lake and this was at the expense of several indigenous species including *Etroplus suratensis*, which has adversely affected the fishery of the lake. Many native fishes and shellfishes, once very common in the lake, were not encountered during the present study. A mass-balanced trophic model of the Veli-Akkulam Lake was constructed using Ecopath software. The study showed that there is a strong bottom-up control in the Veli-Akkulam Lake since an increase in the abundance of phytoplankton and detritus had strong positive impact on most of the other functional groups. In the present condition, the Veli-Akkulam Lake ecosystem is vulnerable and in the verge of extinction due to continuous siltation, pollution and continued debilitation caused by the invasive alien species. Further, the ecological environment of the lake is also deteriorating gradually due to increased developmental activities and encroachment in the watershed area. Strategies for ecosystem-based sustainable management of the lake are proposed, which includes preparation of a comprehensive inventory of all the biotic components of the lake, abating the pollution from different sources, weed removal, construction of permanent breakwaters at Veli and establishment of appropriate institutional structures for lake management.

Keywords: Ecopath, Trophic index, Biodiversity, Conservation, Veli-Akkulam

Major publication appeared in: *Environment and Ecology*

Total no. of pages in the thesis: 354

Total no. of references cited in the thesis: 536

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Title: **“The Nature of Transformation of a River system and its Environs –A Case study of the Neyyar River”**

Researcher: Shibu .A

Guide: Dr. Tresa Radhakrishnan

Subject: Aquatic Biology and Fisheries

Neyyar is an Aar of south-western India located in Trivandrum District. Rivers in Kerala are under greater stress now than ever before, because of anthropogenic interventions such as habitat destruction, pollution through industrial waste and pesticide from agriculture land, over-exploitation of biological and non-biological resources, alterations in river flow and introduction of exotic species, there is no exception in the case of Neyyar. In such a way river after river was transformed for human purposes as the country's economy's demand. So restoration of natural systems to their pristine stage attracts attention world over at the present scenario. The present study is conceived and attempted for the first in its kind for collecting as much information as possible on the hydrographical and sedimentological properties, the biotic communities and productivity to assess how far Neyyar has transformed over a period of 20 years since the first study on these aspects by Nair *et al.* in 1986. The overall result indicates that the river water was alkaline unlike that of the previous study. NO₂-N and NO₃-N were higher and PO₄ and SiO₃-Silicon were lower, during the present investigation. Phytoplankton, though showed species diversity, the species richness and density were much lower than that reported in 1986, similar trend was noted for zooplankton and benthos also. Incidentally, the heavy sand mining in the river might be one of the major reasons for the poor benthic diversity is noted. Though abundance of phytoplankters such as *Melosira*, *Cyclotella* and *Synedra* indicates that the river water is devoid of chemical pollutants, presence of species like *Navicula* and *Nitzschia* indicates deterioration in water quality due to organic contamination. Occurrence of some potent pollution indicators like *Chironomous*, *Tubifex* and other Oligochaetes reveal that the river bed downstream is under pollution threat. Comparison of data between 1986 and the present study clearly suggests that this Aar and its aquatic resources should be preserved, protected and restored from further deterioration and death without any delay.

Keywords: Neyyar, Anthropogenic interventions, Transformation, Restoration, Hydrography, Sedimentology, Biotic communities, Deterioration

Major publication appeared in: ECO-CHRONICLE

Total no. of pages in this thesis: 369

Total No of references cited in the thesis: 609

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Stream: Science & Technology

Subject: *Demography*

Title: “The Role of Family structure on Ageing in Kerala: A Micro simulation Approach”	
Researcher : N. Sasikumar	Guide: Dr. P. Mohanachandran Nair
Subject: Demography	
<p>The demographic change in India particularly in Kerala increases the elderly population. Increasing life expectancy and declining trend of fertility changes the composition of family and the living arrangements of elderly. Life satisfaction of elderly is related to various family factors and their role in providing care. Various factors related to family, health, socio economic and psychological aspects were analysed by using composite index and statistical methods. A symbolic regression model was developed by using Micro Simulation techniques which takes in to account high degree of heterogeneity. A static spatial micro simulation produced a synthetic population by using the known aggregate data. This micro simulation process is done on the basis of genetic algorithm. Analysis of this model shows the significance of various family related factors towards the life satisfaction of elderly.</p>	
<p>Total Number of Pages in the thesis: 210 Total number of references cited in the thesis: 86 Email of Researcher: sasikottoor@gmail.com</p>	

Stream: Science & Technology

Subject: *Environmental Sciences*

Title: “A Study on the Use and Effect of Selected Chemical and Botanical Insecticides in Kerala”	
Researcher: Salini.V.S	Guide: Dr. V. Sobha
Subject: Environmental Sciences	
<p>Influence of Green Revolution and modernization in agriculture increase chemical input in agriculture worldwide. It causes enormous impact on environment and human health. Poor implementation of rules and regulations on pesticide production, import, market and consumption leads to increase pesticide related tragedies largely reported in India like developing countries. Kerala agricultural sector also has going through the same fate. Moreover due to under reporting its actual figure of its status is still unknown. In the present study aimed to figure out the production, import market and consumption status of pesticide for past 50 years in Kerala and document traditional plant protection methods and finally touch with a comparative study of chemical and botanical insecticides on control of coconut pest. The study revealed that synthetic pesticides are the common form of pest control practices in Kerala. Production, import, market and distribution are the most violating sectors. These conditions invite the immediate attention of regulatory authorities. Health survey conducted among the banana farmers revealed that unscientific application of chemical pesticides in Kerala agricultural practices. Documentation of age old farmer’s practices in Kerala exposed that we have a plenty of natural plant and animal origin material for control insect pest. It can be explore as a good alternative against chemical pesticides. Scientific evaluation study of chemical pesticide carbofuran and plant material tobacco leaf powder on third instar larvae of coconut pest, <i>Oryctes rhinoceros</i> suggest that although carbofuran showed a sudden impacts on insect pest, biochemical, haematological, histopathological and cytopathological studies revealed both have detrimental impact on larval safe life. Therefore chemical pesticide carbofuran can be successfully replaced by plant material tobacco leaf powder to control coconut pest.</p> <p><i>Keywords: pesticides, production, import, market, consumption, plant material, scientific evaluation, Oryctes rhinoceros, control</i></p>	
Major publication appeared in: <i>Journal of eco toxicology and Environmental Monitoring</i>	
Total Number of pages in the thesis: 357	
Total number of reference cited in the thesis: 336	
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Title: “An Investigation on the Efficacy of Soil bacteria for the Metabolism and Degradation of Organophosphorus pesticides”

Researcher: Bindhya .R

Guide: Dr. V. Salom Gnana Thanga

Subject: Environmental Sciences

Pesticides played an indispensable role in increasing agricultural productivity, but widespread and extensive use of synthetic pesticides in agriculture has resulted in their accumulation in soil affecting soil microorganisms and thus ultimately influence soil fertility and plant growth. At the same time, certain microorganisms have found to evolve degradative traits as a result of continuous or repeated exposure to pesticides and utilizing them as a sole source of energy and nutrition in moderate concentrations. In view of heavy pesticide usage on agriculture, the present study was undertaken to investigate the efficiency of soil bacteria for the degradation of organophosphorus pesticides. In the first part of the study the extent of effect of different concentrations of three commercial grade organophosphorus insecticides monocrotophos (36%SL), quinalphos(25%EC), and chlorpyrifos (20% EC) on soil microflora were studied under laboratory conditions. A significant main effect was observed in soil microbial activities due to higher concentrations of insecticides and also incubation period. In the second part of the study, attempts have been made to screen organophosphorus pesticide degrading bacterial strains. Several bacterial strains were isolated from the pesticide enriched soil samples, and from that five potential strains were purified and subjected to biochemical characterization and identification upto generic level. The four strains were identified as *Bacillus* sp.1, *Bacillus* sp.2, *Micrococcus* sp and *Rhodococcus* sp and the 5th strain was subjected to taxonomic characterization and identified as *Ochrobactrum thiofenivorans*. DNA and protein profile of the strains were also studied. The utilization of pesticides as sole nutrient sources and the strains extent of tolerance towards the pesticides were also studied. Pesticide residue analysis was also done for chlorpyrifos which is moderately persistent in nature, in liquid media inoculated with bacterial strains. *Micrococcus* sp. and *O thiofenivorans* strains were found to be more effective in degrading high concentrations of pesticides. *O thiofenivorans* exhibited a complete mineralization of 250 ppm of chlorpyrifos in liquid media. The experimental outcomes of the study indicates that higher concentrations of insecticides do have influence on soil microflora but at the same time native soil bacteria are capable of effectively degrading organophosphorus pesticides hence suggests bioremediation as a viable option for degradation of pesticides in soil.

Keywords: Monocrotophos, Quinalphos, Chlorpyrifos, *Bacillus*, *Micrococcus*, *Rhodococcus*, *Ochrobactrum thiofenivorans*, Biodegradation, Bioremediation, Organophosphorus pesticides

Major publication appeared in : Journal of Biotechnology

Total no.of pages in the thesis: 168

Total No.of references cited in the thesis:173

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Stream: Science & Technology

Subject: *Geology*

Title : "Landscape alteration and urban hydrogeology of parts of Thrissur district, Kerala, India"

Researcher: Anet Panakkal

Guide : Dr. R. B. Binoj Kumar

Subject: Geology

Urban growth has amplified the exploitation of natural resources such as groundwater and has distorted land use/land cover pattern. Groundwater systems in urban areas are impacted radically, and this impact can have imperative consequences. Land use and land cover is an imperative module to recognize urban growth status; it shows present as well as past conditions of any area. Land use/land cover change has become a central component in current strategies for managing natural resource and monitoring environmental changes. The study area occupies both Thrissur Corporation and parts of four nearby villages. It is one of the fastest developing cities in the state. Large scale developmental activities are going on in and around the Thrissur corporation at the expense of landscape and this created great strain to the water environment. In view of the above, the present study of Thrissur Corporation and its suburbs have been chosen for a comprehensive investigation. The total area of study is 132 sq km. The study area falls within the geographic coordinates N 10°26'24" - 10°35'16" and E 76°8' 50" - 76°18' 36". The study area is geologically composed of Precambrian crystalline rocks. The main objectives of the present investigations include evaluation of spatial and temporal changes in land use / land cover in the area spreading over thirty years, assessment of the impact of urbanization on the water resources of the area and to relate sediment and water characteristics with ongoing landscape alteration and urbanization. The present work includes studies on topography, drainage, climate, soil, geology of the area, land use classifications, soil texture, soil infiltration studies, and detection of organic carbon, iron and trace metals in sediments. The hydrogeology is dealt in detail which wraps hydrometeorology, behavior of groundwater system, depth to water table below ground level, depth up to the water table above mean sea level and spatial and temporal fluctuations in water table. The groundwater quality of the area for both pre and post monsoon seasons were determined. Quality check was done by screening pH, electrical conductivity, salinity, total hardness, total dissolved solids and major cations and anions in water. The suitability of the groundwater for domestic and irrigation are evaluated. Land use/land cover alteration in the area over 30 years and in addition landscape alteration was also endeavored. Study also includes urban related factors such as bacteriological quality studies of the groundwater by examining total coliform, fecal coliform and *E-coli*. Right at the moment the city dwellers are mostly do face water quality deterioration owing to microbial contamination of drinking water sources, and this makes the attempt meaningful. Then the data obtained out of the sediment studies helped to abridge pollution assessment by calculating the enrichment and contamination factors. Groundwater quality distinction as linked to different land use patterns was also tried out. Productive procedures to improve water stress due to urbanization were also pinpointed.

Major publication appeared in: Nature environment and Pollution technology Journal

Total number of pages in the thesis: 224

Total number of references cited in the thesis: 216

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Title: “Evolution of the lower crust in the Kerala Khondalite Belt (KKB), southern India: petrological and geochemical constraints and insights into a new arc-accretion model”	
Researcher: C. Sreejith	Guide: Dr. G.R. Ravindra Kumar
Subject: Geology	
<p>The Kerala Khondalite Belt (KKB), located at the southern tip of India, is an important lower crustal segment of the southern Indian Granulite Terrain (SGT). KKB has been the subject of several detailed studies for understanding lower crustal processes and its position in the Gondwana assembly. In spite of these detailed studies and prominent position of KKB in the SGT and with the Gondwana coalition, origin and tectonic evolution of the rock association and their entire relationships were not well constrained. Thus, the research aimed to address these fundamental issues and attempted to characterise the pre-metamorphic history of KKB rocks, within the broad objective of accomplishing a secular evolutionary model for granulite-facies lower crust. The overall approach followed in constraining petrology and geochemistry has helped in understanding the evolution of major rock types of KKB. The study, with extensive petrological, mineral chemical and geochemical data from the entire part of the KKB presented hitherto unknown evidence for intracrustal melting and magmatic petrogenesis of major rock units of the KKB in a major deviation to early held view of supracrustal origin of this terrain. The study documented and deciphered the nature of continental geodynamics as magmatic-arc accretion. The tectonic model has been substantiated with the help of mineral chemical and phase relation modelling and suggested rheological reequilibration of the lower crust in KKB due to pervasive melting and granite genesis, leading to rapid exhumation of the terrain.</p>	
<p>Major publications appeared in 1) Journal of Geodynamics Journal of the Geological Society of India</p> <p>Total no. of pages in the thesis: 141</p> <p>Total no. of references cited in the thesis: 302</p> <p>E-mail of the researcher: sreejithedapal@gmail.com</p>	

Title : “Hydrogeological And Associated Geoenvironmental Studies Of Kazhakuttam Block, Thiruvananthapuram District, Kerala State, India”	
Researcher: Divya .M .P	Guide : Dr. R.B. Binoj Kumar
Subject: Geology	
<p>The present study was conducted in Kazhakuttam Block which symbolizes an assortment of both rural and urban environments. The total extension of the study area is 138 km². The study area is in a rapid phase of development. Thus a new landuse system is getting implemented here, which in turn exerts greater stress to the water environment. Fast developmental activities and subsequent disturbance of natural recharging sites and high population demands extraction of more groundwater. Hence attempted the hydrogeology and associated geo-environmental studies. The study helped to augment the groundwater system in this area. As part of the study, groundwater system of the area has been studied by measuring groundwater level in four different seasons from May 2009 to May 2010 including post monsoon and pre monsoon season and observed the groundwater fluctuation. Aquifer properties have been studied by conducting pumping test, soil properties has been studied by analyzing spatial variation of soil texture and by conducting soil infiltration test studies in different litho units. Groundwater quality zonation map of Kazhakuttam Block has been prepared. The analytical result shows that the groundwater samples show an acidic trend in lateritic and clayey aquifers. Low pH can be regulated by appropriate water treatment. South western part of the coastal aquifers shows elevated pollution levels during post monsoon season. Bacterial contamination of the groundwater and surface water also studied by analyzing post monsoon water samples. Bacteriological contamination due to improper design of latrine pits in urban area is observed. Status of saline and brackish water from Arabian Sea and Kadhinamkulam Lake has been evaluated by using GALDIT model. Based on the GALDIT scores the coastal aquifers are under the threat of salt water intrusion. By using various parameters groundwater potential zones and natural recharging sites of Kazhakuttam Block has been identified and suggested that this area should be protected at any cost from further declination of groundwater table. For that identified landslide probable areas and delineated suitable sites for artificial researching and possible areas for various site specific artificial recharging methods. This study recommended to the local self government bodies to strictly prohibit clay mining and landscape modification. It is essential to do periodic monitoring of both quantity and quality of groundwater in this area.</p>	
<p>Major publication appeared in: Journal of Geologic society of India (Springer), International journal of earth science and engineering Total number of pages in the thesis: 383 Total number of references cited in the thesis: 137 Email of researcher: divyamp2008@gmail.com</p>	

Title: **“Hydrogeological Studies of Achankovil River Basin, Southern Kerala, India.”**

Researcher: Manu .M .S

Guide: Dr. S. Anirudhan

Subject: Geology

The Achankovil River originating from the Western Ghat hill ranges is the ninth largest river of Kerala having basin area of 1340 sq.km. Three important hydrogeological facies viz., Weathered Crystalline Rocks (WCR) + fractured rocks, Laterite (LAT) + highly weathered rocks and Alluvium (ALVM) + Tertiary sediments are identified at high land, mid land and low land regions respectively. A close relation between the genetic history of the joints and fractures present in the area with the development of the drainage network which is evident from trend of stream courses of different order. Based on Thornthwaite’s climatic classification, the river basin falls in wet type climate with erratic high rainfall and high humidity. Shallow aquifers viz., WCR, LAT and ALVM, in addition to deeper aquifers viz., fractured rocks and Tertiary sedimentary deposit are the major phreatic aquifers in the Achankovil River Basin (ARB). There is general increase of transmissivity, storativity, specific capacity and optimum yield and a decrease in time for full recovery from east to west, i.e., from WCR to ALVM, in the river basin. The groundwater potential map of the ARB shows small patches of prospective zones in laterite and alluvium and for bore wells, a small part in the high land region as well. Hydro chemical analysis of the ARB showed that the ground water is potable. Statistical analysis of ground water indicates that total dissolved solids have a close relation with the different hydro geological facies existing in the river basin. Silicate weathering dominates in the study area. The ARB, in terms of its physiographic units with its aquifer types was found to be of ‘safe’ category based on the calculation of stage of development of the river basin. Thus the research work presents integrated hydrogeological studies of the ARB. **Key words:** ARB, WCR, LAT, ALVM, drainage network, aquifer parameters, hydro chemical analysis.

Major publication appeared in: *Journal Geological Society of India.*

Total no. of pages in the thesis: 229

Total No. of reference cited in the thesis: 341

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Stream: Science & Technology

Subject: *Mathematics*

Title: “A Study on N -Policy $M/E_k/1/\square$ Queueing Systems with Multiple Exponential Vacations”	
Researcher: Jayalekshmi .G	Guide: Dr. Mary George
Subject : Mathematics	
<p>Queueing Theory is a branch of Operations Research which deals with the mathematical study of waiting lines. The N-policy $M/E_k /1/\square$ queueing systems with exponential vacations are very much useful in modelling communication networks and designing local area networks which turns the server on when the number of customers in the system reaches a particular number N ($N \geq 1$) and turns the server off when there are no customers in the system. This research has presented an operative method for solving problems in queueing models, both in crisp and in fuzzy situations. Fuzzy problems are of utmost importance in an increasing variety of practical fields because real world applications inevitably involve some degree of uncertainty or imprecision. Fuzzy set theory has been demonstrated to be an appropriate means for modeling uncertainty. Hence, queueing models with fuzzy parameters are much more realistic than the crisp queueing networks. In this work four different queueing systems, namely, $G/M(n)/1/K$, $M(n)/G/1/K$, $M/M/1/\square$, $M/E_k /1/\square\square$ are studied and the performance measures are extended to fuzzy environment in hope of its wide range of applications. The system equations for the N-policy, $G/M(n)/1/K$ queues with multiple exponential vacation and $M(n)/G/1/K$ queues with multiple arbitrary vacations were analysed in crisp and the system performance measures were calculated. The algorithm for numerically computing the stationary queue length distribution was developed and its programme code was made with MATLAB, which could handle fuzzy as well as crisp data. The membership functions of the system performance measures for the N-policy $FM/FM/1/\square$ queueing system in which arrival rate and the service rate were all fuzzy numbers, determined using a mathematical nonlinear programming approach. Since the modeling flexibility is higher for Erlangian family of probability distributions when compared to exponential type next we dealt with N-policy controllable Erlang type-k queues with infinite capacity in a fuzzy environment. Hence performance measures of a fuzzy N-policy controllable $M/E_k /1/\square\square\square$ queueing system with vacation using parametric mixed integer nonlinear programming approach is determined. In this work our final and one important objective was to investigate the optimal operating policy of the controllable $M/E_k /1/\square\square$ queueing system using parametric nonlinear programming approach. The objective was also fulfilled. An illustration of the approach was given by making use of Yager’s ranking index method.</p>	
Keywords: Queueing systems, Vacation, N -policy, Fuzzy set theory, Membership function, Erlang service, parametric mixed integer nonlinear programming	
Major Publication appeared in: Bulletin of Kerala Mathematics Association	
Total no: of pages in the thesis: 185	
Total no: of reference cited in the thesis: 57	
Email of Researcher: laksjaya80@gmail.com	

Title : “A STUDY ON SEMIRINGS OF MATRICES OVER LATTICES”	
Researcher : Prakash .G. N	Guide : Dr. A. R. Rajan
Subject : Mathematics	
<p>The study carried out relates to semiring $M_n(D)$ of $n \times n$ matrices with entries from a distributive lattice D mainly using semigroup theoretic tools. Semirings are much studied algebraically and several properties relating to ideals, regularity, dempots etc. are the major aspects considered. Here we have a characterization for the set of all $n \times n$ matrices $M_n(L)$ over a lattice L to become a semiring. We show that $M_n(D)$ is idempotent generated and is k regular. Also we give some sufficient conditions for a matrix to be k-idempotent. We characterize k-idempotents in $M_2(D)$. We have also initiated a linear algebraic study of the semiring of matrices. In this context the concept of d-subspace is introduced and is related to linear independence and invertibility relations. Also we give a sufficient condition for the consistency of a system of linear equations. We have obtained several useful characterisations of Green's relations and regular elements which are significant in the study of this object. Here we prove that two matrices $A, B \in M_n(D)$ are $L(R)$-equivalent if and only if their corresponding column(row) sums are equal and also D-related if and only if $\sum(A) = \sum(B)$ where $\sum(A)$ is the sum of all elements of A. Finally, we discuss special cases of Matrix semirings. First we study the semiring $M_n(B)$, where B is the Boolean lattice $\{0, 1\}$. We characterize the idempotents in $M_n(B)$ and describe the $L(R)$-classes using these idempotents. Also we describe the concept of weight of an $L(R)$-class. We relate the invertibility of matrices in $M_n(B)$ with weight function. Another special case considered is the distributive lattice $D = (\mathbb{N}; \max; \min)$ of positive integers, which has no maximum. Here we consider the matrix semiring $(M_n(\mathbb{N}); +; \cdot)$. We show that the k-idempotents and Green's relations in $M_n(D)$ have descriptions similar to that of distributive lattice with 0 and 1.</p> <p>Keywords: Semirings, idempotent matrices, k-idempotent matrices, d-subspace, Green's equivalences.</p>	
<p>Major publication appeared in : Algebra and its Applications Recent Developments, Narosa Publishing House, 2011. Total Number of Pages in the thesis : 139 Total No. of reference cited in the thesis : 33 Email of the Researcher : prakashgn1976@gmail.com</p>	

Title : “NORMED LINEAR SPACES ASSOCIATED WITH GRAPHS.”	
Researcher: Sriprabha .K .S	Guide : Dr. G. Suresh Singh
Subject : Mathematics	
<p>The connection between several concepts in graph theory and different areas like measurability in graphs, neighbourhood concepts in graphs and also the vector space concepts of a graph were mentioned by many researchers .In this thesis ,we try to bring out the new concept of norm of a graph in two ways; one, on the collection of spanning sub graphs of a graph and the other is on the collection of spanning sub graphs of a graph forming a vector space .This study also consists of a detailed report in properties of normed graphs .Also it covers different matrices of the normed graphs ,spectra's, connection between eigenvalues and Weiner index of a normed graph .This research is a detailed study of another concept known as graph normed space.</p>	
<p>Keywords :Graph norm. Normed graph, Relative normed graph, Graph normed space.</p>	
<p>Major publication appeared in :Bulletin of Kerala Mathematical Association. Total no. of pages in the thesis : 131 Total no. of references cited in the thesis: 21 E-mail of Researcher : sriprabhasivakarunyam@gmail.com</p>	

Stream: Science & Technology

Subject: *Medicine*

Title: “Selected molecular markers as indicators of Clinical profile, Tumour characteristics and Treatment outcome in Squamous Cell Carcinoma of the Larynx”

Researcher: Dr. Elizabeth Mathew Iype

Guide: Dr. B. Rajan

Subject: Medicine

Molecular markers of cancer larynx may predict aggressiveness of cancer and have the potential to allow decision making on responsiveness of the therapeutic modality. This may significantly improve treatment of laryngeal cancer. Objectives of the present study were to study the expression of select molecular markers p53, Bcl-2 (Apoptotic markers), EGFR, Ki67, Cyclin D1 (Proliferation markers) and Cox-2 (Inflammatory marker) in laryngeal cancer so as to form a hypothesis that a particular group of markers will be useful in determining the prognosis of this cancer. Samples from 72 patients with laryngeal cancer who underwent laryngectomy were taken and analyzed for the above said markers and correlated with the clinicopathological factors and the overall and disease free survival. From this study, biomarkers were found to be most useful in predicting aggressive tumor and poor prognosis. Proliferation markers EGFR, Cyclin D1 and Ki 67, individually and collectively were predictive of extracapsular spread and perineural spread of tumour. If they are detected preoperatively in biopsy specimens, has important implications in planning aggressive management. Node negative patients having intense expression of Cyclin D1 or Ki 67 has bad prognosis. May indicate need for a neck dissection or irradiation in node negative neck. The significant expression of Cox-2 was highly predictive of Node positivity. Its assessment will be useful in predicting the occult nodal metastasis and will indicate the need for neck treatment. In older patients and in cases with T4 stage the presence of P53 / Bcl-2 should be determined for prognostication. Markers of aggressiveness were identified as p53, Bcl-2 Cox-2. Markers of invasiveness were EGFR, Cyclin D1 and Ki 67. Markers predicting survival were p53, BCl-2, Cyclin D1 and Ki 67.

Key words:Larynx cancer, Survival, Apoptotic markers, Proliferation marker, Inflammatory marker, p53, Bcl-2, EGFR, Ki67, Cyclin D, Cox-2.

Major publication : Sent for publication in International Journal of Cancer.

Total no. of pages in the thesis: 283.

Total no. of references : 277

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Title: “Course and determinants of outcome of conduct disorder among children and adolescents in a tertiary level pediatric care set up – a follow up study”

Researcher: Dr. Jayaprakash .R

Guide: Dr. Rajamohanam

Subject: Medicine

Conduct disorder (CD) is characterized by a repetitive and persistent pattern of dissocial, aggressive, or defiant conduct with an enduring pattern of 6 months or longer. It is a heterogeneous disorder with wide variations in the range of symptomatology, severity, age of onset, sub types, prevalence and type of co morbidity, functional impairment, response to intervention and outcome. Usually they are labeled as ‘problem child’ in family, school, peer group and social atmosphere and may get rejected. Up to 40% of rejected aggressive children are shown to be at the highest risk to develop antisocial behavior in adolescence. There is no study on CD in Indian setting. The researcher studied the psychosocial and clinical profile, course and outcome and the risk factors which determined poor outcome of CD among children and adolescents. It was a hospital based follow up study with 300 consecutive children in age group 6-18 years who attended Behavioural Paediatrics Unit OP and satisfied ICD-10 DCR guidelines for CD, was collected, intervened with psychosocial and pharmacological measures and followed up for one year. There was significant male dominance (4:1). Clinically significant improvement was observed among 64.51% of study population, which is better than western setting. Determinants of poor outcome of CD identified by logistic regression were single parent family, alcoholism, domestic violence and related psychopathologies, initial symptom severity, and severe type of symptoms, comorbidity and duration of CD. It has many implications at research, academic, clinical and policy level. CD is amenable to intervention in Indian setting, if identified earlier.

Keywords: Behavioral Pediatrics Unit (BPU); conduct disorder (CD); childhood and adolescent onset type of CD; Abnormal psychosocial situation; symptom severity; functional impairment and determinants of poor outcome.

Major publication: Appeared in *Indian Journal Psychiatry*. 2014: 56 (4): 330-6.

Total number pages in thesis: 323

Total number of reference cited: 391

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Stream: Science & Technology

Subject: *Nursing*

Title: “Study of the structure and strategies of teaching & learning process of graduate nursing education in Kerala.”	
Researcher: Salma .S	Guide: Dr. Jolly Jose
Subject: Nursing	
<p>The objectives of the study are 1. To assess the fulfillment of INC requirements for the conduct of Bsc nursing programme. 2. To identify the strength and weakness of syllabus. 3.To compare the INC syllabus and the syllabi of selected foreign countries. 4. Suggest modifications in the graduate nursing education programme. The sample consists of six nursing education institution, 48class room teaching, 48 clinical area, 60 nurse educators, 600 nursing students and 4 syllabi (INC syllabus and 3 syllabi from selected foreign countries). The findings of the study revealed that, No institutions have 100% fulfillment of INC requirements. There is significant difference in the overall scores obtained for Govt. and non-Govt. Institutions (P value <0.005). Govt. institutions obtained higher score than non-Govt. institutions. Only 12% of the classes in Government institutions and 8.33% of the classes in Non-Government institutions scored between 31 and 45 and are placed in good category and the rest in average category. Observation of the clinical area and clinical supervision revealed that there is need for improvement in teacher student ratio, clinical supervision time, teacher student interaction, improvement in supplies, equipment’s and involvement of head and staff nurses in the clinical supervision of students. Apart from the strength there are few weaknesses in the INC syllabus. It obtained higher scores than the syllabi of selected foreign countries.</p>	
<p>Keywords: Structure and strategies, teaching learning process, graduate nursing education.</p>	
<p>Major publication appeared in: Kerala Nursing Forum Total number of pages in the Thesis: 248 Total number of reference cited in the Thesis: 131 Email of the Researcher: salmapmk@yahoo.co.in</p>	

Title: **“Prevalence of anaemia among adolescent girls and the outcome of nutrition education Programme”**

Researcher : Swapna Jose

Guide : Dr. K. E. Elizabeth

Subject : Nursing

Anaemia is a world wide public health problem, most commonly due to wide spread nutritional deficiencies. With the highest adolescent population in India, the real challenge for the nation is to provide nutrition, health and education for them. This study was carried out to assess the prevalence of anaemia among adolescent girls and the outcome of nutrition education programme. 1000 adolescent girls were screened for anaemia using WHO haemoglobin color scale and prevalence of anaemia was found to be 57.8%. The study revealed that the adolescent anaemia is significantly associated with age, place of domicile, socio-economic status, family size, BMI, knowledge regarding anaemia and dietary pattern. The percentage of RDA met for the consumption of foods was found to be low. Nutrition education was provided to the experimental group of adolescent girls and the results compared with control group to assess the outcome of nutrition education. The intervention model developed was a nutrition education programme which had an audio visual presentation CD, developed by the researcher and an education session. The programme consisted of causes, types, signs & symptoms, prevention of anaemia, dietary diversification and importance of nutrition in rectifying anaemia. There was significant improvement in knowledge, dietary pattern and haemoglobin level in experimental group compared to the control group. The study focuses on prevalence of anaemia , causes and proposes a model for effective intervention.

Key words- prevalence, anaemia, adolescent girls, nutrition education.

Major publication appeared in : *Paediatric Companion, Nightingale Nursing Times*

Total no. of pages in the thesis: 233

Total No of references cited in the thesis : 209

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Stream: Science & Technology

Subject: *Physical Education*

Title: “AN ANALYSIS OF PERSONALITY AND EMOTIONAL COMPETENCE OF ATHLETES”

Researcher : Charles A. Joseph

Guide : Dr. Shailaja Mohan

Subject : Physical Education

The study is related with personality and emotional competence which is essential to assess individual personality of athletes and their competent ability. The main objective of the study is to measure the emotional competence and personality of athletes belonging to Track & Field, Volleyball, Football and Basketball and to compare emotional competence and personality of athletes belonging to various age groups (junior, youth and senior) in Track & Field, Volleyball, Football and Basketball. The questionnaires used for the study was Eysencks’s Personality Questionnaire Revised (EPQ-R) by Eysenck H. J and Eysenck S. B. G (1975) and Emotional Competence by Sharma H C and Bharadwaj R (1995). 960 male athletes were selected from Junior (16-18), Youth (19-21), Senior (+22) from Track & Field, Volleyball, Football and Basket ball with a minimum of 150 subjects in each sports. The athletes with at least District level competition were selected. Descriptive statistics such as mean, standard deviation and comparative statistics such as one way analysis of variance has been used. Coefficient of correlation was applied to measure the degree of interrelationship in various sub factors of EPQ-R and Emotional Competence Scale. In all the statistical tests, the level of significance was chosen to be 1% or 5% and if the calculated P-value (Probability of Type I Error calculated from the sample, in statistical terminology) is less than 0.01 or 0.05, there exists statistically significant mean difference between the groups. All the statistical analyses were carried out with the help of Statistical Package for Social Sciences (SPSS 19.0 version) for WINDOWS. The result shows that there exist a significant difference in the Personality and Emotional competence factors of various sports and age groups. For the total sample in various sports, the dominant personality factor is Extraversion followed by Neuroticism and Psychoticism. And in Emotional competence for the total sample in various sports 57.6% of athletes belongs to average competence, 22.3% belongs to competent level and 20.1% of athletes belongs to Incompetent level. The study indicates that emotional competency and personality will help the athletes to know their psychological ability and to perform at their level best.

Key words: Personality, Emotional competence, Extraversion, Neuroticism, Psychoticism.

Major Publication appeared in: m R N A

Total No. of pages in the thesis: 184

Total No of reference cited in the thesis: 101

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Title: “ISOLATED AND COMBINED EFFECT OF THERABAND RESISTANCE EXERCISE AND MEDICINE BALL EXERCISE ON SELECTED PHYSICAL FITNESS, PHYSIOLOGICAL, PSYCHOLOGICAL AND BIOCHEMICAL VARIABLES OF SCHOOL BOYS”

Researcher: Deepak .S .S

Guide: Dr. K. K. Venu

Subject: Physical Education

The purpose of the study was to find the effect of isolated and combined effect of Theraband resistance exercise and Medicine ball exercise on selected physical fitness, physiological, psychological and bio chemical variables of school boys. To facilitate the study 80 boys from Army Public School, Trivandrum District were randomly selected as subjects and their age was between 14 and 15 years. They were assigned into four groups of which one group served as Theraband Resistance exercise groups, second group served as Medicine Ball exercise group, third group served as combined Theraband Resistance exercise and Medicine Ball exercise group and the fourth group served as control group. The study was formulated as a true random group design, consisting of a pre test, mid test and post test. The subjects (n=80) were randomly assigned to four equal groups of twenty each. The groups were assigned as Experimental Groups I, II, III and control group respectively. Pre tests were conducted for all the subjects on selected physical fitness, physiological, psychological and biochemical variables such as Abdominal strength, Shoulder strength, Leg explosive strength, Resting pulse rate, Breath Holding Time, Systolic Blood pressure, Anxiety, Aggression, Stress, Plasma content, RBC and haemoglobin content. The experimental groups participated in their respective theraband practices, medicine ball practice and combined theraband exercises and medicine ball practices for a period of eight weeks. The midtest tests and post tests were conducted on the above said dependent variables after a period of theraband resistance practice, medicine ball practice and combined theraband resistance and medicine ball practices. The training programme was scheduled at 6.30 to 7.30 a.m. on 3 to 4 days in a week. Various tests were conducted to find out Abdominal strength, Shoulder strength, Leg explosive strength, Resting pulse rate, Breath Holding Time, Systolic Blood pressure, Anxiety, Aggression, Stress. Blood sample was collected for RBC count, Plasma content and haemoglobin test. To find out the difference between the pre test, mid test and post test, repeated measures ANOVA was used. Whenever it found significant, the Newman kuels post-hoc test was administer. Analysis of covariance (ANCOVA) was applied and whenever the adjusted post-test means were found significant, the scheffe’s post-hoc test was administer to find out the paired means difference. To test the obtained results on variables, level of significance 0.05 was chosen and considered as sufficient for the study. The result reveals that the combined group (Theraband resistance exercise and Medicine ball exercise) have shown increased level of abdominal strength, shoulder strength, leg explosive strength, blood pressure (systolic), breath holding time, hemoglobin content, RBC and plasma level and decreased level in anxiety, aggression, stress level and resting pulse rate than the Theraband resistance exercise, Medicine ball exercise and control group

Keywords: Theraband, Medicine ball, Abdominal strength, Shoulder strength, Leg explosive strength, Resting pulse rate, Breath Holding Time, Blood pressure, Anxiety, Aggression, Stress, Plasma content, RBC and haemoglobin content.

Major Publication appeared in: Gurujyothi Research & Reflections (ISSN 0976-0865)

Total No. of pages in the thesis: 203

Total No of references cited in the thesis: 85

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Title: “EFFECT OF AEROBIC EXERCISE PROGRAMME ON BLOOD GLUCOSE, HEALTH RELATED PHYSICAL FITNESS AND QUALITY OF LIFE OF TYPE II DIABETIC PATIENTS”	
Researcher: Jacob George	Guide: Dr. Usha Sujith Nair
Subject: Physical Education	
<p>The purpose of the study was to determine the Effect of Aerobic Exercise Programme on Blood Glucose, Health Related Physical Fitness and Quality of Life of Type II Diabetic Patients. The variables selected were Fasting Blood Sugar, Post Prandial Blood Sugar (Blood Glucose), Flexibility, Strength, Endurance, Body Fat (Health Related Physical Fitness) and Quality of Life in total and its four sub domains that is : Physical, Psychological, Social and Environmental. The objectives of the study are the following (a) To determine the effect of aerobic exercise programme on fasting blood sugar and postprandial blood sugar in Type-2 diabetic patients. (b) To investigate the effect of aerobic exercise on health related physical fitness components in Type-2 diabetic patients and (c) To find out the effect of aerobic exercise on the quality of life in Type-2 diabetic patients. Descriptive statistics were used to find the mean and standard deviation. ANCOVA was used for the comparison among different stages in the experimental and control groups. Scheffe’s post hoc pair-wise comparisons in different stages of control and experimental groups were done to find any significant stage wise difference. In the case of experimental group who underwent training programme, significant improvement were seen in all the selected variables that is : Fasting Blood Sugar, Post Prandial Blood Sugar , Flexibility, Strength, Endurance, Body Fat and Quality of Life in total and its four sub domains that is : Physical, Psychological, Social and Environmental following the training programme. When compared stage wise, significant differences were seen among all the variables. While in the case of the control group no changes were seen in any of the variables during the training period. The results of the study suggest that twelve weeks of aerobic exercise programme would result in decreasing the Blood Glucose level, improve the status of Health Related Physical Fitness and Quality of Life of Type II Diabetic Patients.</p>	
Total no. of pages in the Thesis: 171	
Total no. of references cited in the Thesis: 177	
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Stream: Science & Technology

Subject: *Physics*

Title: “Investigation of the Atmospheric Boundary Layer Characteristics over the Tropics through Numerical Weather Prediction Models.”	
Researcher : Anurose. T .J	Guide : Dr. Damu Bala Subrahmanyam
Subject : Physics	
<p>The physical processes in any numerical weather prediction (NWP) model determine the amount of energy that reaches the Earth’s surface, the evolution of atmospheric boundary layer (ABL), formation of clouds, convection and precipitation, the influence of soil and orography on the atmosphere and are dealt through parametrization schemes. As the global model grid resolutions are consistently getting improved, the correct representation of turbulent diffusion and surface characteristics in the parametrization of ABL has attained special attention in the atmospheric modelling community. The choice of boundary layer parametrization can have a large impact on the diurnal cycle of meteorological fields such as temperature, wind speed and mixing height, dispersion of pollutants and therefore affect the usefulness of short- to medium-range weather forecasts and climate simulations in different ways. Despite a considerable progress in the prediction of weather conditions, the errors and uncertainties associated with the ABL parametrization schemes in the NWP model simulations remain one of the primary sources of inaccuracies, especially for the tropics where small-scale cumulus convection dominate. The work addresses the challenges and issues related to ABL parametrization schemes by making use of two NWP models, namely; the High-resolution Regional Model (HRM) and the COnsortium for Small-Scale Modeling (COSMO) in conjunction with the experimental observations over coastal and oceanic environments. The research work leads to the refinement of a parametrization scheme based on thermal roughness length, which shows improvements in the surface energy budget estimation and have significant impacts in the simulation of meteorological parameters over the heterogeneous coastal environment. The study also addresses the complexities involved in the diurnal evolution of ABL over a heterogeneous coastal environment in comparison with a homogeneous marine conditions.</p>	
Major Publications appeared in : Boundary Layer Meteorology (Springer Journal) Total number of pages in the thesis : 162 Total number of reference cited in the thesis : 149 Email of Researcher : anurostj@gmail.com	

Title: “Organic Dye – PVA Nanocomposites for Optoelectronic Applications”	
Researcher: Beenakumari .C	Guide: Dr. C. I. Muneera
Subject: Physics	
<p>Growth of Optoelectronics as a science and widespread commercialization of its technology have been offering tremendous opportunities for the design and synthesis of new optical materials. Nonlinear optical (NLO) materials play an ever-increasing role in laser applications and have a great impact on information technology, defense, industries, and, of late, life sciences and medical diagnostics. The interaction of intense light beams with optical materials has opened up a new era for optical communication, where many well-known radio-frequency techniques have been transferred to the domain of optical frequencies, offering greater speed and efficiency. Optical telecommunications and public networking, signal processing, optical computing and information storage etc. require high-speed optical-electrical data interconversion, which in turn drives a vast need for advanced, extremely efficient device components such as optical waveguides, switches, optical limiters, light emitting devices and detectors. Nonlinear optical techniques hold great promise, and have real and significant applications in Photonic Devices, Quantum Imaging, Quantum Computing/Communications, Optical Switching, Buffers and Routers. NLO materials possessing large third order nonlinearities, ultrafast response time, high damage threshold, easy processing and handling, flexibility in design and structural modification etc. are the required properties for such device applications. However, the lack of high-quality photonic materials is often the chief limitation in implementing these ideas.</p>	
Key Words: Optical limiting, Dye-polymer nanocomposites, Z-scan	
Total no. of pages in the thesis: 326	
Total no. of reference cited in the thesis: 367	
Email of Researcher: techoff.phy@gmail.com	

Title: “Vibrational Spectroscopic studies of a few monometallic iodates and bromates.”	
Researcher: Kochuthresia .T .C	Guide: Dr. M. Junaid Bushiri
Subject: Physics	
<p>The present work mainly deals with structural studies of a few bromates and iodates using vibrational spectroscopy. The crystal structural studies of thorium bromate hydrate and Barium bromate is confirmed by Raman and FTIR studies. The structural difference of α & β forms of Indium iodate are investigated. Octahedral coordination of Iodine with Oxygen atoms is detected in the 3d- transition metal iodates. Twinning of crystals are also detected in these materials, and are found to be useful to fabricate 2nd harmonic and 3rd harmonic sources. Effect of Lanthenide Contraction is observed in the Lanthnide Iodates which were brought under investigation. Electronic Raman transitions were observed in both Dysprosium and Neodymium iodates. The appearance of fluorescent transition along with Raman bands in the present study indicates strong coordination of Dysprosium and Neodymium ions, with surrounding Oxygen atoms. Highly intense Raman bands in Neodinium iodates are attributed to rarely observed Raman enhancement.</p> <p>Keywords: Raman, FTIR, metal iodates, IO₆ octahedron, Raman enhancement.</p>	
Major publication appeared in: Journal of Applied Spectroscopy	
Total no.of pages in the thesis:161	
Total no.of reference cited in the thesis:190	
Email of Researcher:kochuthresiatc@gmail.com	

Title: **“Green Synthesis and applications of Au, Ag, Au-Ag, Pd and SnO₂ nanoparticles”**

Researcher: Meena Kumari .M

Guide: Dr. Daizy Philip

Subject: Physics

Green routes for the synthesis of metal and semiconductor nanoparticles are of increasing interest due to the global concern related to environmental pollution. They find potential use in diverse fields which contribute to the well-being of human society namely biomedical, environmental and engineering fields. The thesis deals with the synthesis of Au, Ag, Au-Ag, Pd and SnO₂ nanoparticles using certain biocompatible materials. An environmentally benign bottom up approach for the synthesis of gold and silver nanoparticles using edible coconut oil and pomegranate fruit juice is reported for the first time. Pomegranate fruit juice is also used for the formation of Au-Ag bimetallic nanoparticles as well as SnO₂ nanoparticles. Palladium nanoparticles have also been synthesized by a one-step reduction and capping method using tannic acid, a green reagent. The nanoparticles have been characterized by UV-visible spectroscopy, TEM and XRD. The interaction of capping molecules with metal nanoparticles is manifested using FTIR. The stable and crystalline nanoparticles obtained using different environmentally benign reducing agents are used as potential catalysts in the degradation reactions of certain pollutants. They show remarkable size dependent catalytic activity and the reduction kinetics for all the reactions follow pseudo-first order. Enhancement in thermal conductivity of the base fluid (water) in the presence of metal nanoparticles and that of base fluid, ethylene glycol, using SnO₂ nanoparticles presents them as good nanofluid suspensions. The radical scavenging activity of different assays exhibited by the nanoparticles promise them as useful materials in biomedical field. A better comparison needs a more thorough authentication of the synthetic routes of the samples which remain a future perspective of the work. The antibacterial activity of the SnO₂ nanoparticles proposes them as good bactericides if fed in proper concentrations which also points to the future scope.

Major publication appeared in: Spectrochimica Acta, PartA and Powder technology

Total no.of pages in the thesis: 120

Total no. of reference cited in the thesis: 301

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Title : “FUNCTIONAL COMPOSITES FOR ELECTROMAGNETIC INTERFERENCE SHIELDING APPLICATIONS”

Researcher : Nina Joseph

Guide : Dr. M. T. Sebastian

Subject : Physics

The research deals with the detailed investigation on the synthesis and characterization of poly (vinylidene fluoride) (PVDF) and polyaniline based electromagnetic interference (EMI) shielding materials in the frequency range of 8.2-18 GHz. PVDF composites with various fillers were developed for electrostatic discharge (ESD) and EMI shielding applications. Low shielding materials (< 20 dB) for ESD applications were obtained by adding fillers like barium titanate, silicon carbide and carbon black into PVDF polymer matrix. The PVDF based high shielding composites (> 20 dB) were obtained by the incorporation of fillers like carbonyl iron, graphite flakes and graphene nanoplatelets. The work also includes the synthesis of polyaniline nanofibers as well as polyaniline nanofiber-graphite composite based EMI shielding materials. They have been synthesized by simple chemical polymerization method without any structure directing agents and organic solvents. Absorbing ink as well conducting cotton and nylon fabrics with good EMI shielding properties were also developed based on synthesized polyaniline nanofibers and its composite. The effect of various parameters such as shielding thickness, filler particle size, presence of conducting filler and conducting layer on the EMI shielding response were investigated on the developed PVDF based composites. It was found that a fundamental understanding of these parameters is very important to achieve high performance EMI shielding materials.

Major publications appeared in: *Journal of Material Chemistry C*, *RSC Advances*, *Materials Letters* and *Materials Research Bulletin*.

Total number of pages in the thesis: 178

Total number of reference cited in the thesis: 233

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Title: **“Synthesis and Characterization of Certain Lanthanide based Microwave and Optical Ceramics”**

Researcher: Remya .G .R

Guide: Dr. Annamma John

Subject: Physics

Lanthanide based ceramic compounds play an important role in microwave and optoelectronic applications. Ceramic materials used as dielectric resonators in the microwave communication systems have become indispensable components in the modern world. In the present thesis, the structure and microwave dielectric properties of composites of lanthanide based titanium tantalates and niobates and the effect of doping on the structures and properties are investigated. The applicability of nano perovskite structured rare earth based aluminates for optoelectronic applications are also investigated. The characterization techniques used in the present work are XRD, SEM, TEM, Microwave and Radiofrequency measurements, UV-Vis and PL spectroscopy and FT Raman and FTIR spectroscopy. The dielectric and optical properties of $x\text{SmTiTaO}_6(1-x)\text{YTiNbO}_6$ ($x=1, 0.8, 0.6, 0.55, 0.5, 0.45, 0.4, 0.2$ and 0) and ZnO and Eu_2O_3 doped $\text{Pr}_{0.22}\text{Y}_{0.78}\text{TiTaO}_6$ and $\text{Nd}_{0.23}\text{Y}_{0.77}\text{TiTaO}_6$ composites are studied. The compositions $0.8\text{SmTiTaO}_6.0.2\text{YTiNbO}_6$ and $0.6\text{SmTiTaO}_6.0.4\text{YTiNbO}_6$ and 0.5 and 1.0 wt% of Eu_2O_3 and 0.5 wt% of ZnO doped $\text{Pr}_{0.22}\text{Y}_{0.78}\text{TiTaO}_6$ and $\text{Nd}_{0.23}\text{Y}_{0.77}\text{TiTaO}_6$ compositions are found to be excellent materials for fabrication of microwave devices. These materials also show high absorption in UV region, hence are suitable for optoelectronic applications also. The structural and optical properties of nanocrystalline REAlO_3 ($\text{RE} = \text{Ce}, \text{Pr}, \text{Sm}, \text{Gd}$ and Y) are investigated. Among them Sm, Gd and Y aluminates are found to be excellent materials in the field of optoelectronic applications.

Keywords: Ceramics, Dielectrics, Microwave, Optical, Nano

Major publication appeared in: Journal of Materials Science: Materials in Electronics

Total no. of pages in the thesis: 138

Total no. of reference cited in the thesis: 265

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Title: “SYNTHESIS AND CHARACTERISATION OF NANO STRUCTURED MOLYBDENUM AND TUNGSTEN BASED CERAMIC MATERIALS FOR OPTICAL AND ELECTRICAL APPLICATIONS”

Researcher: Vidya .S

Guide: Dr. Jijimon K. Thomas

Subject: Physics

The major objective of the present work was the synthesis of molybdenum and tungsten based nano ceramics and to investigate its suitability for various optical and electrical applications through a modified combustion technique. Simple oxides of molybdenum (MoO_3) and tungsten (WO_3), scheelite compounds AMoO_4 and AWO_4 and nano ceramics based on two composition $\text{A}_{0.5}\text{B}_{0.5}\text{MO}_4$ and $\text{AMo}_{0.5}\text{W}_{0.5}\text{O}_4$ ($\text{A}=\text{B}=\text{Ba, Sr, Ca}$ and $\text{M}=\text{Mo, W}$) were prepared. The structural characterization confirmed that the samples preserved its tetragonal scheelite structure while the optical and dielectric properties varied with change of composition. The experimental results obtained in this work also demonstrate the application of these materials as UV filters, anti-reflection coatings, transparent conducting oxide films for window layers on solar cells, scintillators, detectors, and sensors. As all the samples were sintered at temperatures below 900°C without any sintering aid with good dielectric properties, these materials are ideal candidate for low-temperature co-fired ceramic(LTCC) applications and especially as substrate materials. The main advantage of these materials is that they are glass-polymer free pure ceramic materials. Generally used LTCC materials such as glass composites and polymer composites have the shortcomings of high value of dielectric loss, large thermal mismatch, high sintering temperature etc. A pure ceramic material with good dielectric property can overcome all these difficulties. Thus MoO_3 , WO_3 , AMoO_4 , AWO_4 , $\text{A}_{0.5}\text{B}_{0.5}\text{MO}_4$, $\text{AMo}_{0.5}\text{W}_{0.5}\text{O}_4$ and $\text{A}_{0.5}\text{B}_{0.5}\text{MO}_4$ ($\text{A}=\text{B}=\text{Ba, Sr, Ca}$ and $\text{M}=\text{Mo, W}$) are excellent class of materials for LTCC substrate applications.

Major publication appeared in: Journal of Materials Science: Materials in Electronics, Journal of Electronic Materials, Advances in Condensed Matter Physics, Physica Status Solidi A, Journal of Alloys and Compounds, Journal of Raman Spectroscopy, Materials Research Bulletin (Total 20 International Publications)

Total no. of pages in thesis: 219

Total no. of reference cited in the thesis: 405

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Stream: Science & Technology

Subject: *Psychology*

Title: “Effect of Psychological Empowerment in Career Aspiration and Managerial Efficacy among Management Students”

Researcher: Asha Peter

Guide: Dr. S. Raju

Subject : Psychology

Psychological empowerment was considered to be a cognitive state characterized by a sense of perceived control, perceptions of competence, and internalization of the goals and objectives of the organization. The present study concentrates on psychological empowerment and its influence on career aspiration and managerial efficacy among management students. The study helps to evaluate the effect of training programmes, based on Time management skills, assertive communication skills, and decision making and problem solving on the study variables among the management students. This is an intervention program on a sample of 120 management students from different Colleges in Kerala, categorized into three experimental groups and one control group. Each group has 30 MBA students. Quasi experimental design was used for the present study. The tools used for the present study were: Psychological Empowerment Scale, Career Aspiration Inventory, Managerial Efficacy Scale, and Personal Data Schedule. The data were collected by administering the tools individually to the MBA Students from different colleges in Kerala. **Major Findings:** The major findings of the investigation are given below.

1. There were significant effect of training programme namely time management skills among management students for the variables psychological empowerment, career aspiration and managerial efficacy.
2. There were significant effect of training programme namely assertive communication skills among management students for the variables psychological empowerment career aspiration and managerial efficacy.
3. There were significant effect of training programme namely decision making skill and problem solving on management students for the variables psychological empowerment, career aspiration and managerial efficacy.
4. There is significant correlation between the study variables among the management students.

Implications of the Study: Some of the implications of the study are given below: The findings of the study are useful to improve the psychological empowerment, career aspiration, and managerial efficacy for the MBA students. Empowerment is multi-dimensional processes, it occurs within sociological, psychological, economic, and other dimensions. Psychological empowerment is connected with the time management skills, assertive communication skills, and decision making and problem solving skills. Empowerment can help the companies to keep their best people by giving them better training, more responsibility, and a greater role in determining their firm’s destiny. So the psychological empowerment training programmes can be effectively used in the management students to improve their quality of education in the business field.

Keywords: Psychological Empowerment, Career aspiration, Managerial Efficacy ,Time Management, Assertive Communication Skill, Decision Making and Problem Solving skill

Major Publications: Published Paper on Career Aspiration among Management students (2013) Golden Research Thoughts International Recognition research Journal, India. Published paper on Effect of De-addiction Treatment on Anxiety, Depression, Stress and Self Efficacy of Alcohol Dependents (2013) The Psyche space International Recognition research journal, India

Total no. of pages : 280

Total no. of references cited in the thesis : 108

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Title: “AESTHETIC ETHICS, PERSONALITY AND ADJUSTMENT OF SCHEDULED TRIBES IN SOUTH KERALA A PSYCHOSOCIAL STUDY”

Researcher : Kabani .P.S

Guide: Dr. S. Jayakumari

Subject : Psychology

Kerala society is a complex social system with different castes, classes, creeds and tribes. The tribes are the most neglected and underdeveloped groups. *Adivasi* is an umbrella term for a heterogeneous set of ethnic and tribal groups claimed to be the aboriginal population of India. The present study attempts to investigate whether there is any significant difference in Aesthetic Ethics, Personality and Adjustment of different scheduled tribes in South Kerala. The total sample consisted of 500 subjects; 350 scheduled tribes and 150 villagers. STs in Inner Forest 75, STs in Outer Forest 100, STs settled in Villages 100, STs settled in Towns and Cities 75 and Villagers (Other than tribes) 150. The age range of subjects was 18-60 years, in which both the gender groups are included. The procedure included administration of the tools to different STs in South Kerala individually after giving instructions and assuring confidence. The results shows that STs in inner forest have high morality, aesthetic judgment, aesthetic appreciation, taste and ideal of beauty, body language and total aesthetic ethics compared to STs in outer forest, STs settled in villages, STs settled in towns and cities and villagers (other than tribes). Inertia is high among STs in outer forest and high level of activation is seen among STs settled in towns and cities. Stability is high among STs in inner forest. STs in inner forest have satisfactory family adjustment, health adjustment, social adjustment, emotional adjustment and over all adjustment. It is expected that the present study will give a clear insight into the aesthetic ethics, personality and adjustment of scheduled tribes of South Kerala.

Keywords: Aesthetic Ethics, Personality, Adjustment, South Kerala 'Scheduled Tribes

Major publication appeared in :Indian Psychological Review, Journal of

Community Guidance and Research

Total no. of pages in the thesis:242

Total no. of reference cited in thesis:188

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Title: “Psycho-social Factors related to Complications in Pregnancy and Labour in Primigravidae.”

Researcher: Nitya K. Prasad

Guide: Dr. Immanuel Thomas

Subject: Psychology

Pregnancy and labour are both normal and natural affairs in all the species in the world. Clinical observations by Gynaecologists and Obstetricians have indicated that normal conception and subsequent labour in ‘homosapiens’ might end up in biological complications due to the interplay of psychological factors like fear and anxiety, negative expectations, unhealthy attitudes and insufficient information of the ‘would be mothers’ towards pregnancy and labour. The present research was conducted to understand the role of psycho-social factors in the incidence of pregnancy related problems and complications that occur in the first pregnancy and labour in women. The study measured whether pregnancy related problems were significantly related to: Psycho-social variables (e.g., age, education, occupation, socioeconomic status, etc.); Attitudinal and personality variables (e.g., attitude towards pregnancy, Type A behavior, anxiety, etc.); and complaints reported during the 3 trimesters of pregnancy. The sample for the study consisted of 155 primigravidae (first time mothers) in their first trimester between the age group of 19-35 years obtained from 3 private hospitals in Trivandrum. The participants were met individually by the researcher in the clinical setting during their visits to the gynaecologists and the test materials were administered to them during different phases of their pregnancy and labour. The most important predictors of pregnancy related problems prior to delivery were found to be state anxiety, depression, and pregnancy related apprehensions and fears. In the case of problems during labour, the single most important predictor was found to be trait anxiety. With regard to problems during post-delivery period, the important predictors were found to be certain socio-demographic variables (viz., number of siblings, age of respondents, and perceived lack of social support), in addition to trait anxiety and problems reported during the trimesters of pregnancy.

Keywords: Psycho-social Factors, Pregnancy, Labour, Primigravidae.

Major publication appeared in: the psychespace

Total no. of pages in the thesis: 219

Total no. of reference cited in the thesis: 256

Email of Researcher: nityakprasad@gmail.com

Title: “DIABETES MELLITUS IN RELATION TO LIFE STYLE AND STRESS - AN ANALYTICAL STUDY.”

Researcher: Raji .O.S

Guide: Dr. Asha Balagangadharan

Subject: Psychology

Health is the overall state of physical, mental, and social well being and not just the absence of disease. Lifestyle of an individual can lead to many kinds of diseases which lead to ill health. **Life style diseases** emerge as a silent killer in our nation. It is predicted that by 2020, lifestyle diseases will be causing 7 out of 10 deaths in developing countries. The increasing emphasis on the interaction between psychological factors and development of lifestyle diseases is attracting considerable attention. Life style disease especially **diabetes** is increasing in Kerala. Kerala has a prevalence of diabetes as high as 20% – double the national average of 8%. The prevalence is seen as 17% in urban, 10% in the midland, 7% in the highland, and 4% in the coastal regions. The study attempts to find out the difference if any with regard to the psychological factors such as the personality and stress tolerance of the type 2 and non diabetic individuals. The study also analyzes the effect of certain discrete Socio-demographic variables in the type 2 diabetic and non diabetic individuals. .. **MAJOR HYPOTHESES** There will be significant difference between type 2 diabetic patients and normals with regard to their personality pattern. There will be significant difference between type 2 diabetic patients and normals with regard to their stress tolerance level. The five factors of personality will have significant correlation with the level of stress tolerance of type 2 diabetic patients and normals. There will be significant difference between type 2 diabetic patients and normals with regard to their life style. There will be significant difference between type 2 diabetic patients and normals with regard to their socio demographic variables. **SAMPLE:** The sample of the present study comprises of a group of 100 type 2 diabetic (50 males and 50 females) patients and a group of 100 (50 males and 50 females) non-diabetic individuals. The patient groups were selected using purposive sampling method from government and private hospitals in Thiruvananthapuram and the group of non-diabetic individuals were selected from the general population. **TOOLS:** The tools used for the present study were Personal Information Schedule, Five Factor Personality Inventory and Stress Tolerance Scale. **STATISTICAL TECHNIQUES:** The major statistical techniques used for analyzing the data are t-test, one way ANOVA, and Pearson Product-Moment Method of Correlation, Duncan test. **MAJOR FINDINGS OF THE STUDY:** Significant difference was observed between the type 2 diabetic patients and the non-diabetic individuals with regard to their personality pattern. Significant difference was observed with regard to the lifestyle. Significant difference was not found between the type 2 diabetic patients and the non-diabetic individuals with regard to their stress tolerance level. Certain socio-demographic variables have significant effect on the stress tolerance level of the type 2 diabetic patients and the non-diabetic individuals. **IMPLICATIONS OF THE STUDY:** The study records the effect of the psycho social factors in the incidence of type 2 diabetic individuals called life style disease. It also emphasis the role of psychological factors in the incidence and prognosis of diabetes. When the relevance of the present study in this context is considered, it can be said that all the findings of the present investigation can be of much help for those working with diabetic patients; the family member who live with the patients, and others directly or indirectly related to the welfare of diabetic patients.

Keywords : Diabetes mellitus, Life style, Stress, Personality

Major Publication appeared in: Psychespace

Total no. of pages in the thesis: 279

Total no. of reference cited in the thesis: 44

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Title: “Perceived parental attitude in relation to personality of adolescents”	
Researcher: Renjini .T	Guide: Dr. Rita Krishnan
Subject: Psychology	
<p>The research is a exploration of the existing parenting practices among parents of adolescents in Kerala. The study had two parts. First a study of the existing practices in parenting in adolescents was examined. The sample of the study was college students of the age group 17-19 studying in arts and science colleges inThiruvananthapuram district. 129 students their sibling and their parents were taken as sample. The aim was to study parenting and its perception within a family. For this parenting was studied in three dimensions viz acceptance, psychological control and firm control.Then the factors related to healthy personality and self esteem of adolescents were identified. The data collected was analysed using SPSS .The following tests were done t-test.anova, correlation and step wise multiple regression Some of the major findings are Adolescents value acceptance by parents. There is difference in parental perception between parents and adolescents and this is more so in the acceptance dimension. The importance of father’s role in parenting was established. Environmental mastery autonomy and stability are the factors most necessary for healthy personality. Acceptance by both parents has positive influence on healthy personality and self esteem of adolescents</p>	
<p>Major publication appeared in Psyche space Total no of pages 189 Total no of references 124 Email id trenjini@yahoo.com</p>	

Stream: Science & Technology

Subject: *Statistics*

Title: “Study of Some Estimation Problems Using Order Statistics”	
Researcher: Priya .R .S	Guide: Dr. P. Yageen Thomas
Subject: Statistics	
<p>This research work concentrate the estimation problems based on order statistics. In this work first we introduce a new estimation technique for estimating the scale parameter of a symmetric distribution using sum of symmetrised spacings. Also we have derived certain conditions which ascertain the non-negativity of the best linear unbiased estimator (BLUE) and best linear invariant estimator (BLIE) of the scale parameter. We extend the above type of simplification on the BLUE and BLIE of the common scale parameter using the theory of order statistics of independent and non-identically distributed (inid) random variables. A method of estimation namely estimation by U-statistics of the location and scale parameters based on order statistics as kernels has been developed and to estimate the parameters of Type III generalised logistic distribution and those of symmetric beta-Cauchy distribution. Ranked set sampling (RSS) is a recently developed method of estimating the parameters of a parent distribution when observational economy consideration is required to be carried out. The problem of estimating the common location and scale parameters of several distributions under economy consideration is not seen attempted in the available literature so far. So we demonstrated this problem and illustrated the results developed in this direction in our research work.</p>	
Key words: Best linear invariant estimator, Ranked set sampling, Spacings, U-statistics	
<p>Major publications appeared in: Communications in Statistics-Theory and Methods; IAPQR Transactions; Aligarh Journal of statistics Total no. of pages in the thesis: 175 Total no. of reference cited:114 Email of researcher: rspriyathoppil@gmail.com</p>	

Stream: Science & Technology

Subject: Zoology

Title: “Role of serotonin and hydrogen sulfide in neuronal ion transport during stress acclimation of climbing perch, *Anabas testudineus* Bloch”.

Researcher : Anupriya Samuel

Guide : Prof. M. C. Subhash Peter

Subject : Zoology

Fishes are constantly exposed to stressful conditions in the aquatic medium and they respond to stressors by evoking a varied pattern of stress response. The activation of the neuroendocrine system that brings out biochemical and physiological modifications ultimately favors the fish to acclimate to the hostile environment. [Brain](#), thus plays a critical role in the body’s perception and subsequently in stress response. Serotonin (5-HT), a neurotransmitter that plays an important role in the regulation of biological rhythms has been implicated in stress adaptation in fish. On the other hand, hydrogen sulfide (H₂S), a novel endogenous gaseous bioactive substance, has recently been implicated in the regulation of cardiovascular and neuronal functions though its physiological role remains less understood in fish. Despite the extensive studies on the neuroendocrine responses to stress, the role of serotonin and hydrogen sulfide in brain mitochondrial ion transport is not yet well studied in fish particularly during stress response. In the present study, the effects of tryptophan (TRP), the serotonin precursor in brain ion transport during stress conditions was examined in the climbing perch, *Anabas testudineus* Bloch. Short-term *in vivo* and *in situ* actions of 5-HT were studied in the test model targeting the ion transporters like Na⁺, K⁺ -ATPase, Mg²⁺ -ATPase, Ca²⁺ -ATPase, and H⁺ -ATPase. The action of *in vivo* H₂S on ion regulation was also studied in this fish. The analyses of data indicate that serotonin and its precursor TRP can modify the magnitude of post-stress acclimation as evident in the pattern of tested physiological indices in various regions of the brain. This suggests that serotonin can act as a stress modifier as it regulates neuronal ion transport as part of stress response. Likewise, the data also point to the involvement of H₂S in neuronal stress response in fish as it also regulates neuronal ion transport in the test species.

Keywords: Tryptophan, Serotonin, Hydrogen sulfide, ATPases, Brain, Neuronal ion transport, Stress, fish.

Major publication appeared in :Journal of Endocrinology and Reproduction 18 (2014)

Total No of pages in the thesis: 227

Total No of references cited in the thesis: 481

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Title: “Studies on the immunomodulatory potentials of certain phytonutrients on *Macrobrachium rosenbergii*”

Researcher: Jasmine Anand

Guide: Dr. A. Akhila Thomas

Subject: Zoology

The present study was undertaken to study the expression profile of AMPs and immune related genes in prawn reared on herbal diets with immunomodulatory efficacy when challenged with *Vibrio harveyi*. To analyze the molecular mode of action of these herbal enrichments in terms of immunomodulatory potency in prawn, medicinal herbs like *Tinospora cordifolia*, *Withania somnifera*, and *Ocimum sanctum* were selected. *Macrobrachium rosenbergii* (25-30)gms were reared for one month on the medicinal herb diet, subsequently challenged with *Vibrio harveyi* to evaluate whether the phytonutrients in these plants can alter the gene expressions at molecular level. The tissue level expressions (gill, gut, hemolymph, hepatopancreas, muscle) were monitored after 6 hrs. of bacterial challenge. The expression levels of immune genes were determined by quantitative real-time PCR in 5 tissue samples of treated and normal prawns. Of the 3 plants analyzed *Tinospora cordifolia* and *Ocimum sanctum* showed the maximum fold change of expression in muscle and hemolymph with respect to control. In growth studies (PL 30, two months treatment) all the three plants showed a highly positive result. Thus in the present study, molecular data and growth studies clearly implicates the cumulative role of these phytonutrients as immunomodulators and growth promoters. Thus incorporating these medicinal herbs in *Macrobrachium rosenbergii* culture gives as an eco-friendly, cost effective, sustainable aquaculture practice and a promising health care prospect at molecular level.

Keywords:; Relative gene expression; Immunomodulators; Real Time PCR; *Macrobrachium rosenbergii*

Major publication appeared in: Ecoscan , Aquaculture

Total number of pages in the thesis: 304

Total number of references cited in the thesis: 291

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Title: **“BISPHENOL A AS AN ENDOCRINE DISRUPTOR: STUDY ON INTERMEDIARY METABOLISM, MITOCHONDRIAL METABOLISM AND OXIDATIVE STRESS RESPONSE IN A FRESHWATER TELEOST, ANABAS TESTUDINEUS”**

Researcher: Gireesh Kumar .K

Guide: Dr. Francis Sunny

Subject: Zoology

Bisphenol A (BPA), an industrial chemical, is used to manufacture polycarbonate and numerous plastic articles including feeding bottles, is considered as a potent estrogenic endocrine disruptor. BPA is acutely toxic to aquatic organisms and is considered hazardous to the aquatic environment. The present study was mainly focused on the impact of BPA on some aspects of intermediary metabolism, hepatic mitochondrial metabolism and oxidative stress in a freshwater teleost, *Anabas testudineus*. Laboratory acclimatized fish were exposed to sub lethal doses of 2.5, 5.0 and 7.5 mg/l of BPA for 15, 30 and 45 days in the laboratory, using appropriate methodology with standard protocols. The current study revealed that the effect of BPA on selected aspects of reproductive endpoints such as increase in serum estradiol, decrease in serum testosterone and increase in serum vitellogenin in male fish that affected the T4 and sex steroid biosynthetic pathway in male fish. Changes in the levels of both sex hormones might result an interruption of steroid regulated cellular and physiological process to produce changes in fish intermediary metabolism. The study also revealed that the delicate balance among the mitochondrial enzymes is disturbed by BPA exposure, which may lead to changes in the mitochondrial metabolism. Alterations in the mitochondrial antioxidant enzymes activity, up regulation of SOD gene expression and amelioration in lipid peroxidation products following BPA exposure revealed that the fish experienced oxidative stress. This study also gives a perspective on the utilization of *A. testudineus* as an experimental model to study the biomarkers of exposure to BPA. Moreover, fish can provide an early warning on effects of endocrine disruption that may later become apparent in other wildlife species and ultimately in humans.

Keywords: Bisphenol A, *Anabas testudineus*, Intermediary metabolism, Mitochondrial metabolism, Oxidative stress

Major publication appeared in: journal of Aquatic Biology and Fisheries

Total no. of pages in the thesis: 239

Total no. of reference cited in the thesis: 743

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Title: **“Role of serotonin, tryptophan and α-tocopherol in ion transport during stress response in mice”**

Researcher: Manish .K

Guide: Prof. M. C. Subhash Peter

Subject: Zoology

The stress response is a vitally important normal response of all living organisms. The transport of ions across the membranes of cells and organelles is a prerequisite for many of life's processes. The response of ion transporters to serotonin, a neurotransmitter and the effects of tryptophan, a precursor of serotonin (5-HT) and α-tocopherol, were tested in mice to understand how these factors influence the ion transport in mice during stress response. The activity pattern of ion transporters like Na⁺/K⁺ ATPase, H⁺ ATPase, Ca²⁺ ATPase and Mg²⁺ ATPase were measured in mice tissues after stress induction or supplementation with tryptophan or α-tocopherol. The mitochondrial and cytosolic responses to these treatments showed prominent modifications suggesting an important role of 5-HT in these ion transporters. A tissue-specific response was observed after this treatment in the test model. Short-term L-tryptophan treatment and 5-HT perfusion showed substantial modifications in the ion transporter activity in both mitochondrial and cytosolic transporters. Supplementation of α-tocopherol rich-diet appeared to mitigate the chronic restraint stress due to metabolic disturbance and alteration in ion transporter response in mice. A protective role of α-tocopherol and 5-HT in ion transport during restraint stress was found in test species. Thus α-tocopherol supplementation appears to be beneficial in improving the restraint stress-induced physiological implications on the performance of ion transporters in mammals.

Keywords: Stress, Serotonin, α-tocopherol, Ion transporters, Mammals, Supplementation.

Major publication appeared in: *Research Journal of Pharmaceutical, Biological and Chemical Sciences*

Total number of pages in the thesis: 224

Total number of references cited in the thesis: 468

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Title: “ROLE OF PROLACTIN IN ION-TRANSPORT DURING STRESS ACCLIMATION OF THE AIR-BREATHING FISH *Anabas testudineus* BLOCH”

Researcher: Mini .V .S

Guide: Prof. M. C. Subhash Peter

Subject: Zoology

Co-Guide: Dr. Valsa Jacob

Prolactin (PRL), an adenohipophysial hormone that acts as a regulator of multiple biological functions, plays an important role in osmoregulation and ion transport in freshwater teleost fishes. Prolactin is a polypeptide hormone that is synthesized and secreted from specialized cells of the anterior pituitary gland, the lactotrophs. In the present study, the role of PRL in the osmotic homeostasis was tested in an air-breathing fish, *Anabas testudineus* kept either in freshwater and in dilute seawater. The role of PRL in stress response was also tested. Consequently, the long-term *in vivo* and short-term *in situ* PRL actions on ion transport were studied in the test species. *In vitro* (dose-dependent) PRL on ion transporter activity in intact and bromocriptine-treated (PRL antagonist) perch were also studied. The specific activities of Na⁺, K⁺, H⁺, Mg²⁺ and Ca²⁺-dependent ATPases in the gills, kidney, intestine and liver were quantified along with plasma metabolites including glucose, lactate and urea. The results indicate that PRL exerts dose-responsive differential actions on monovalent and divalent cation pump activities and PRL can regulate ion transporter activities in fish and can promote osmotic competencies in the test species. The data also support the hypothesis that ambient salinity and net confinement can modify the action of PRL so that the fish to fine-tune their ion transport during environmental challenges. Overall, the data indicate that PRL regulates cellular ion homeostasis in this air-breathing fish.

Keywords: Prolactin, *Anabas testudineus* Bloch, ATPases, Bromocriptine

Title: “ECOBIOLOGICAL ASPECTS OF AN ESTUARINE FISH- <i>LIZA PARSIA</i>”	
Researcher : Razeena Karim .L	Guide : Dr. Sherly Williams .E
Subject : Zoology	
<p>Ashtamudi estuary, the second largest wetland in Kerala lies in the Kollam district, characterized by highly diversified fish fauna. Objectives of the study include the analysis of water quality of Ashtamudi lake with special reference to various pollutants, to study the morphometric characteristics and length weight relationship of <i>Liza parsia</i>, to study the reproductive biology of fish which includes GSI, fecundity, ova diameter, Sex ratio, stage at first maturity etc, to analyze the biochemical composition (Protein, lipid, carbohydrate, moisture and ash content) and heavy metals in the tissues (Liver, Muscle and Ovary) of fish. Results of water quality analysis revealed that site 2 and 3 found to be more polluted than site 1. Results of the body parameters of the fish related to total length showed that the 'b' value in studied fish indicated negative allometric growth pattern in three sites. The growth rate is found to be more in females than in males. Monthly Gonado Somatic Index, fecundity and ova diameter studies of fishes from three sites were carried out and it was found that the species spawns year round with a peak breeding period extent from September to February. From the histopathological point of view, examination of ovary and testis showed degenerative, collapsing and necrotic changes. Results of Biochemical analysis showed that Moisture, Protein and Carbohydrate were found to be higher in site 1 followed by site 3 and site 2 where as lipid were found to be higher in site 2. Heavy metal analysis showed that fishes from all the three sites are found to have accumulated heavy metals in their tissues and comparatively lesser values are shown by site 1 and site 3 and site 2 indicate the heavy metal load in the Ashtamudi lake as a whole. It was further supported by the SEM studies. Thus the study throws light on the influence of pollutants of water as well as the well being and reproductive potentiality of fish <i>L.parsia</i>.</p>	
<p>Keywords : Ashtamudi lake, <i>Liza parsia</i>, Pollution, Heavy metal, Gonado Somatic Index, Fecundity, SEM</p>	
<p>Major Publication- Nature Environment and Pollution technology Total no. of pages in the thesis: 297 Total no of references sited in the thesis :578 Email of Researcher: razeenashibili@rediffmail.com</p>	

Title: **“Impact of sewage of Parvathyputhenar in a freshwater fish, *Anabas testudineus*”**

Researcher: Soorya .S .R

Guide: Dr. Francis Sunny

Subject: Zoology

Sewage water was collected from Parvathyputhenar, a highly polluted river in the heart of Thiruvananthapuram city to study the impact of sewage on different parameters in the experimental animal *Anabas testudineus* exposed to sewage. When the fish was exposed to sewage for time periods, the fish experienced oxidative stress, which was determined by assaying the antioxidant enzymes and lipid peroxidation products in the liver, brain and kidney. Alterations in the antioxidant enzymes activity and amelioration in lipid peroxidation products following sewage exposure clearly revealed that the fish experienced oxidative stress. Intraperitoneal treatment of Vitamin-E was useful to decrease the toxicity by quenching oxidative stress imposed by sewage. To study about neurotoxicity of sewage, the effect of sewage on brain acetylcholinesterase activity was studied and the possible protective effect of Vit-E on acetylcholinesterase was also analysed. Acetylcholinesterase activity was found to be significantly decreased upon sewage treatment but it was enhanced three fold on Vit-E treatment. Neurotoxicity conferred by sewage was ameliorated by Vit-E treatment. The reproductive potential of the animal was determined by assaying steroidogenic enzyme, 17 beta hydroxy steroid dehydrogenase (17- β HSD) activity in ovary. 17- β HSD activity was found to be decreasing significantly from control value on sewage exposure. Histopathological studies of liver, kidney and brain revealed extensive damages in the treated samples and these changes were alleviated by Vit-E treatment thus confirming its protective role. Histopathology of the ovary also confirms the damage caused on the reproductive system by sewage. GC-MS of estrogenic BPA in sewage water was done to confirm and quantify the presence of the estrogenic compound in sewage water. An alarming concentration of 1.075092 mg/L of BPA was present in the sewage water. The biochemical and histopathological alterations found can be attributed to the cumulative effect of Endocrine disrupting chemicals present in the sewage.

Key words: Parvathyputhenar, Sewage, Antioxidant enzymes, Lipidperoxidation products, Oxidative stress, Acetylcholinesterase, 17 β HSD, Vitamin-E, Endocrine disrupting chemicals

Major publication appeared in : Journal of aquatic biology and fisheries

Total No of pages in thesis: 188

Total No of references cited in the thesis: 502

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Title: “Habitat Dependant variations in brain of fresh water teleosts”	
Researcher: Sreekala .S	Guide: Dr. Sherly .P.S
Subject: Zoology	
<p>Teleosts comprise a huge and diverse radiation and there is considerable variation in brain structure across teleosts. Ecological and social factors have an important role in evolution of shape of the brain. Mechanism of habitat preferences is very complicated and the stimuli for feeding were perceived by senses like smell, taste, sight and lateral line system. Structural variations in the command head quarter of the body (brain) probably be used to predict potential niches better than any other structure of an organism (Kotrschal & Junger, 1988). Habitat is an ecological parameter, play important role in evolution of brain. According to Niewenhuys et al., (1998), an animal’s life style is reflected in the organization of its central nervous system. The main objectives of the study were to analyze morphology and histology of forebrain, midbrain and hind brain regions in fishes like <i>Aplocheilus lineatus</i>, <i>Ophiocephalus striatus</i> and <i>Heteropneustus fossilis</i> with reference to habitat, statistical studies correlating the habitat and the brain morphology in these fishes and effect of organophosphate and carbamate pesticides on Acetyl choline esterase [Ache] activity in different tissues [brain, gill, liver, muscle and kidney] in two fishes, , <i>Ophiocephalus striatus</i> and <i>Heteropneustus fossilis</i>. Results of the ANCOVA relating habitat, brain length is compared with olfactory lobe, olfactory bulb, olfactory tract, cerebral hemisphere, optic lobes, cerebellum, medulla oblongata indicates growth rate differs widely between species and the Acetylcholine esterase activity was measured as described by Ellman et al.,(1961) revealed that the effect of sevin and methyl parathion, showed significant decline in AchE levels of brain, muscle, gill, kidney and liver tissues of , <i>Ophiocephalus striatus</i> and <i>Heteropneustus fossilis</i>.</p> <p>Key words: Teleosts,Habitat, <i>Aplocheilus lineatus</i>,<i>Ophiocephalus striatus</i> , <i>Heteropneustus fossilis</i> ,Acetyl choline esterase, Pesticides.</p> <p>Major publications appeared in: International journals like <i>Indian Journal of Science and Technology</i>, <i>Ecoscan</i> , <i>Proceedings of the 98th Indian Science Congress and in 21ST Swadeshi Science Congress</i>.</p> <p>Total no. of pages in the thesis :193 Total no. of references cited in the thesis: 340 Email of Researcher : sreekalas.suresh@gmail.com</p>	

Title: ***“The Role of Brachyuran Crabs in Structure, Composition and Recruitment of Mangrove Forests in Kerala”***

Researcher: V. P. Praveen

Guides: Prof. Mathew M. Oommen

Subject: Zoology

Co-Guide: Dr. T. S. Nayar

The work was undertaken at Kunhimangalam (Kannur district), Mangalavanam and Puthuvypu (Ernakulum district) in Kerala, India with the following objectives: (i) assess the structure and composition of mangrove species in relation to brachyuran crabs (ii) study spatial and temporal distribution of mangrove seedlings in relation to crabs (iii) study crab herbivory in relation to seedling demography (iv) assess the influence of crab population on mangrove structure (v) assess the role of crab community in the health of mangrove ecosystem and (vi) based on the above, attempt to evolve strategies for conservation of mangroves. *Sesarmops intermedius* is the major predator of mangrove seedlings. *Parasesarma plicatum* feeds mainly on decomposed leaves. Hence, experiments were carried out with *S. intermedius* using the seedlings of *Avicennia officinalis*, *Aegiceras corniculatum*, *Excoecaria agallocha* and *Rhizophora mucronata*. This was done to know the species and age preferences of seedlings exhibited by the crab. Ten crab species were identified from the study areas. *Sesarmops intermedius* and *Parasesarma plicatum* were the dominant herbivores among them. Kunhimangalam showed the highest crab density (9.83 m^{-2}) followed by Mangalavanam (5.77 m^{-2}) and Puthuvypu (5.43 m^{-2}). Crabs exhibited spatial and temporal variations with the highest density in monsoon. There were 12 species of mangroves in the study areas. *Aegiceras corniculatum*, *Avicennia officinalis*, *Excoecaria agallocha* and *Rhizophora mucronata* were the dominant species. The propagule production was estimated at 18829 number day⁻¹ hectare⁻¹. Monsoon was the peak period of propagule production. Seedling density showed spatial and temporal variations. The highest density was observed during monsoon. Crab species richness was directly proportional to plant species richness in all the study areas. Period of the highest seedling density coincided with the period of the highest crab density. However, sapling density did not show any spatial or temporal variation. Series of controlled predation experiments revealed that *S. intermedius* preferred seedlings of *E. agallocha* to that of other species and evidently preferred to 20 day old seedlings. Morphological factors like height, weight and stem diameter and, chemical factors like fibre, latex and nitrogen contents of seedlings cumulatively favoured predation preference. To know the impact of seedling predation on forest structure and composition, three study sites (S₁, S₂, S₃) with varying densities of *Sesarmops intermedius* were selected at Kunhimangalam. Predation preference of the crab was correlated with the rate of seedling predation, crab density, sapling density, tree density and species composition in these sites. It was found that the sapling densities at S₁, S₂ and S₃ were not in concurrence with the existed species composition. This showed the impact of preferential predation of *S. intermedius*. It is inferred that if the crab density, predation preference and sapling density remain constant, the species composition at S₁ and S₂ may change from *Avicennia officinalis* and *Excoecaria agallocha* dominant stand to a *Rhizophora mucronata* dominant stand in future as there will not be a reservoir of *A. officinalis* and *E. agallocha* saplings. The present forest at S₃ is dominated by *E. agallocha*. It may change to a forest dominated by *R. mucronata*. The results also show that the crab density in mangrove ecosystem regulates the seedling density when crab density is at $3.33 \pm 0.97 \text{ m}^{-2}$ and when it exceeds $8.89 \pm 0.87 \text{ m}^{-2}$, it may harm the ecosystem as there may not be any seedlings left for recruitment. The study has brought out valid conclusions which hold the potential to evolve strategies not only for conservation of mangrove ecosystems but also for the afforestation and reclamation programmes of mangrove forests in general. Moreover, the results strongly support the view that the crab community can possibly perform the role of a keystone species in mangrove ecosystems.

Key words: seedling recruitment, *Sesarmops intermedius*, Kunhimangalam, Forest structure, feeding preference

Major publication: Journal of Bombay Natural History Society

Total number of pages in the thesis: 200

Total number of reference cited in the thesis: 276

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Title: **“Biology of *Oecophylla smaragdina* (Fabricius) with special reference to formic acid profile and ethno entomological practices.”**

Researcher: Vidhu .V.V

Guide: Dr. D. A. Evans

Subject: Zoology

Polymorphic colony of social insect *O.smaragdina* possessed 3 types of apterous sterile workers such as typical worker, major worker and minor worker, winged females (Queens) and winged males (Drones). We could identify an intermediate category of workers or typical workers which showed marked difference from other workers morphologically biochemically and genetically. The colony structure showed sharp fluctuations in relation to climatic conditions and the abundance of all the different types of individuals were observed during May to October which corresponds to South-West and North-East monsoon in Kerala. Typical workers are the most abundant workers in all seasons (65%) followed by major workers (25%) and minor workers (10%).The content of major defensive compound FA showed circannual and circadian rhythm within the three worker castes. The highest amount of FA was seen during May to July and in between 12 pm to 2 pm in 24 hour cycle. The content of FA showed fluctuations in relation to aggression and altruism. Continuous biting and altruism are accompanied by 50% loss of body weight, complete loss of FA, hyperproteinemia, accumulation of ACh and cessation of Transaminase activity. The enzyme systems responsible for FA secretion such as HD, GND-FDH were not seen in larvae of these ants and hence they have no traces of FA in their body. Activity of Transaminases such as AsAT and AlAT showed very high activity in adult worker ants which was 10 times higher than that of the activity in larvae and pupae. The enzyme LAP was very active in larvae which was about 14 times higher than that of the activity in adult workers. The enzyme Cathepsin D has a significant role in pupation. Usefulness of *O.smaragdina* as a food supplement to tribal communities was validated through the presence of exceedingly high content of all the essential amino acids and vitamins such as Thiamine, Riboflavin, Niacin, Ascorbic acid, Tocopherols and Retinols with very low content of lipids. Existence of pharmacologically very active compounds with anti arthritic and anti microbial activity in the abdominal glands of this ant species benefits the traditional healer’s formula of making medicated oils with effective remedy against rheumatism and skin infections.

Key words: *Oecophylla smaragdina* (Fab.), Typical workers, Formic acid, hnoentomological values.

Major publication appeared in : New Horizons in Insect Science (Springer India 2015)

Total no.of pages in the thesis: 178

Total no.of references sited :179

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Stream: Science & Technology

Subject: *Geography*

Title : “LAND DEGRADATION IN HIGH LANDS: A STUDY IN IDUKKI DISTRICT OF KERALA”

Researcher: Anil Kumar .J

Guide: Dr. R. Anilkumar

Subject: Geography

When the man approached land for various uses with the intention to generate income have initiated the decline of productivity of land. Since productivity is a major factor in the economy, the search of virgin land mainly the forest areas were transformed to agricultural plantations, estates with varied intensities. The study has brought out the magnitude of land use / land cover changes in the study area. The cause of the major changes in land use was the rapid growth of population by way of migration from nearby taluks as well as from adjacent states. Degradation of portions of land in the Idukki district could be delineated through the study. About 14% of the forest have been degraded due to the deforestation occurred between 1973-2011. Another 14% of the area was degraded due to the destruction of the virgin land for the development of infrastructure and for mixed crops in the district. Degradation is progressing in the other 12% of the area due to unscrupulous activities of man in connection with the expanse of agricultural land in the form of plantations, mining activities and tourism. The degree of vulnerability of the land has been derived based on slope, drainage density, vegetation cover, population density and literacy.

Key words: land use, land degradation, vulnerability, regeneration

Total number of pages: 205

Total number of reference cited in the thesis: 91

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Title: “LAND SYSTEM ANALYSIS OF KABANI RIVER BASIN, WAYANAD DISTRICT, KERALA”

Researcher: Vandana .M

Guide: Dr. Srikumar Chattopadhyay

Subject: Geography

This study stresses that a sustainable land management plan can be devised through detailed scientific analysis of land system units within the frame work of a river basin. The research findings emerged from this study are listed here. Denudational process dominates the land systems in this basin. The flat bottomed wide valleys bear imprints of past climate change. Soil profile indicates presence of loose materials 3 to 4 m below the ground level, a manifestation of tropical alternate dry and wet condition. Present day rainfall shows declining trend. Seven land systems units, namely, Flood plain, valley fill and alluvial basin (F1), Low rolling terrain (D1), Moderately undulating terrain (D2), Highly undulating terrain (D3), Isolated hills (D4), Scarp slope (D5), and Hummocky terrain (H1) characterize the study area. Each of these units are ecologically unique and differs in their production potential. Slopes are graded with wide spatial variations in erosion and transportation as emerged from hypsometric analysis. Plateau landscape is not uniform with graded condition in the central area and youthful topography along the plateau margin. Anthropogenic influence is clearly evident in valleys and hill slope configuration. Landslide, soil erosion, water shortage, flash flood, change in natural vegetation cover and shifting from food crop to cash crop are major problems. Land management plans worked out for each land system units provide a guideline for landuse planning. Watersheds have also been prioritized for interventions. The data generated through this study may be useful for land resource management for Wayanad district and the methodology used here may have larger implications.

Key words: Land system, Land management plan, Landuse planning

Major Publication appeared in: Transaction & Journal of Geo-Marine sciences

Total Number of pages in the thesis: 200

Total number of references: 188

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Stream: Science & Technology

Subject: *Futures Studies*

Title: “HIV/AIDS Pandemic Modeling in a developing context”	
Researcher: Dr. Prasanna Kumar Manuel	Guide: Dr. V. Nanda Mohan
Subject: Futures Studies	
<p>Simple epidemiological models of the HIV epidemic in India were developed to study the trajectory of the epidemic, to estimate the incidence of new infections and to look into the implications of various preventive interventions. The HIV prevalence data of various risk groups over time were used to identify the growth pattern of the epidemic by fitting exponential and logistic curves. The ‘Modes of Transmission’ model, developed by UNAIDS was adapted for use in India to estimate the incidence of new infections as well as their distribution in 2009. System Dynamics, a mathematical deterministic simulation method was used to develop simple models for the study of HIV transmission in the high risk groups of Injecting Drug Users, Men having Sex with Men and Female Sex Workers and their clients, the core populations driving the epidemic in India.</p> <p>Results: The exponential and logistic curve fitting showed that at the national level, except among MSM, the epidemic is showing a downward trend, whereas no such inference could be drawn from the Kerala data, probably because of insufficiency of data. The MOT models for India, Andhra Pradesh, Manipur, Maharashtra and Kerala have revealed that the epidemic has shifted markedly from high risk populations and their partners to groups with low risk sexual behaviour, (married men and women) requiring new strategies to address them. The variation in the epidemic in various regions were shown to be related to the varying extent of risk behaviour and adoption of preventive responses. 20% of new infections in the country might be due to male homosexual behaviour. 25% of new infections in Andhra Pradesh are generated by the clients of FSWs and their partners. The model may not apply in Kerala, where migration is the overriding factor. The system dynamics models showed that the HIV prevalence among injecting drug users and male homosexuals are likely to increase whereas, among female sex workers and their clients, the present level of interventions is sufficient to control the epidemic. A highlight of this study is the geographical distribution of the HIV burden in Kerala which established the true density of HIV infections taluk-wise and showed a strong cross border influence. The strong correlation shown by the HIV burden at the taluk level to the outmigration rates also indicate the dominant influence of migration on the HIV epidemic in Kerala.</p>	
Key words: HIV epidemic; HIV model; MOT model; system dynamic model	
Total Number of pages in the thesis: 331	
Total number of references cited: 180	
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Stream: Science & Technology
Subject: *Biotechnology*

Title: “Microbial Inoculants in Elephant Foot Yam (*Amorphophallus paeoniifolius* (Dennst.) Nicolson) with Special Emphasis on Potassium Solubilizers”

Researcher: Anjanadevi .I .P

Guide: Dr. R. S. Misra

Subject: Biotechnology

Co-Guide: Dr. Susan John

It is known that, use of microorganisms having the ability to deliver or make available mineral nutrients for plant uptake and suppress diseases are significantly regarded as superior to all other means of promoting nutrient and disease management as it is safe to human health, ecofriendly as well as profitable. Hence, the present research work principally aimed at exploiting the microbial diversity of the hot spots of India for both nutrient management and disease control. In this study, bacteria, fungi and actinobacteria were isolated from different places of India and assessed their ability for N fixing, P and K solubilizing activities. More than twenty potent isolates were identified through biochemical and molecular methods. Their 16S genes have been submitted in the NCBI-GenBank and most potent strains have been submitted in NCIM, Pune. The characteristic potential of each of the most efficient N fixing, P and K solubilizing bacteria for ability to produce various growth regulators, resistance to diverse physiological conditions and maintenance of a compatible liaison with each other were explored. The possibility of using cassava flesh as one of the cheapest and easily available raw material for media preparation for the mass cultivation of these strains in a short span of time was also explored. For making effective bioformulations, talc followed by saw dust and cassava thippy was found as the best carrier material. Preservative function of cassava seed oil by observing the viable population during long time of storage was also observed. Moreover, this study gave special thrust on potassium solubilizers. Characterization of K solubilization in detail including analysis of K release from feldspar by bacteria and actinobacteria through FTIR, SEM, XRD, XRF and GC-MS, investigation of genes involved in K solubilization through cDNA RAPD and SSH PCR cDNA subtraction, development of rock powder bioformulation for K solubilizers were carried out. The efficacy of the potent N fixer, P and K solubilizers both individually and in combination were evaluated for three consecutive years by providing biocontrol method of disease management in the growth and productivity of one of the most important tuber crops viz. elephant foot yam (EFY) under field condition. Field experiment clearly demonstrated the chances to substitute chemical fertilizers to the tune of 50% (N), 100% (P) and 33% (K) with potent NFB, PSB and KSB respectively when used independently and 50% of NPK fertilizers when applied in combination with these bioinoculants. Based on this, a farmer level recommendation was also formulated for agro advisory services.

Keywords: N fixers, P & K solubilization, Bioinoculants, rock powder bioformulation, SSH, elephant foot yam

Major publication appeared in: Journal of Basic Microbiology

Total no. of pages in the thesis: 308

Total no. of reference cited in the thesis: 441

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Title: “Microbial reduction of perchlorate: Optimization of environmental variables and analysis of microbial communities involved.”	
Researcher: Anupama .V.N	Guide: Dr. Krishnakumar .B
Subject: Biotechnology	
<p>Perchlorate (rocket fuel) (ClO₄⁻) is an emerging environmental contaminant, used mainly in the strategic sector as solid propellant in rockets/missiles and other industries like crackers, match-box, electroplating, etc. Even at ppb level, ClO₄⁻ is known to interfere with the functioning of human thyroid gland leading to hypothyroidism and related physiological disorders. Therefore our interest was to monitor perchlorate contamination drinking water in Kerala and microbial detoxification of this persistent pollutant. Our study revealed high level perchlorate contamination of ground water in Ernakulam and Trivandrum Dists., particularly around space R&D unit units (VSSC/ISRO) where perchlorate is handled in bulk. With the objective of decontaminating perchlorate, we have developed a heterotrophic mixed microbial system and optimized degradation conditions in batch cultures. We validated the developed ClO₄⁻ reducing consortium lab scale fed-batch type bioreactor. Treatment study of real effluent from VSSC rocket propellant plant and ISRO APEP was done. The community structure of bacteria, archaea and protozoa in the bioreactor plays a crucial role and hence their analysis was done through molecular/metagenomics approaches. The kinetics of one of the respiratory enzymes Chlorite dismutase involved in perchlorate reduction was also studied in detail in this research work. We have also isolated and characterized a halophilic and wide pH tolerant perchlorate reducing <i>Serratia marcescens</i> sp that will find application for treating perchlorate containing high strength effluents.</p>	
<p>Major publications appeared in- (1) J. Environ. Health Sci. & Eng., (2) Microbiol. Res. (3) Environ. Tech., (4) FEMS Microbiol. Lett. (5) Water Sci. Technol.: Water Supply (6) 23rd Kerala Science Congress Best paper. Patent filed; <u>0277NF2013</u> Total number of pages in the thesis: 215 Total number of references cited in the thesis: 381 Email of the researcher; anupilla@gmail.com</p>	

Title: “Functional analysis of Smurf2 ubiquitin regulatory factor 2 (Smurf2), a HECT E3 ubiquitin ligase, in breast cancer.”

Researcher: Diana David

Guide: Dr. S. Asha Nair

Subject: Biotechnology

Smurf2 is a member of the HECT family of E3 ubiquitin ligases that play important roles in determining the competence of cells to respond to TGF- β /BMP signaling pathway. However, besides TGF- β /BMP pathway, Smurf2 regulates a repertoire of other signaling pathways ranging from planar cell polarity during embryonic development to cell proliferation, migration, differentiation and senescence. Expression of Smurf2 is found to be dysregulated in many cancers including breast cancer. The purpose of the present study is to examine the effect of Smurf2 knockdown on the tumorigenic potential of human breast cancer cells emphasizing more on proliferative signaling pathway. The multi-functional scaffolding protein, Connector enhancer of kinase suppressor of ras 2 (CNKSR2), plays a key role in regulating cellular proliferation and differentiation through multiple receptor tyrosine kinase pathways. In the present study, we demonstrate a novel direct interaction of CNKSR2 with the E3 ubiquitin ligase, Smad ubiquitin regulatory factor 2 (Smurf2) by immunoprecipitation, immunofluorescence studies, and surface plasmon resonance (SPR) analysis, and that the interaction occurs in a ligase-independent manner. CNKSR2 protein levels were significantly increased upon forced overexpression of Smurf2, indicating the role of Smurf2 in regulating the stability of CNKSR2. Conversely, Smurf2 knockdown resulted in a marked decrease in the expression of CNKSR2 by facilitating enhanced polyubiquitination and degradation and thereby reduced the proliferative and clonogenic potential of MDA-MB-231 breast cancer cells. Tissue microarray data from 84 patients with various stages of mammary carcinoma, including normal, usual hyperplasia, fibrocystic changes, fibroadenoma, carcinoma-in-situ, and invasive ductal carcinoma showed a statistically significant association with Smurf2 and CNKSR2 expression, which is also well correlated with the ER, PR, and HER2 status of the breast tissue samples. A comparatively high expression of Smurf2 and CNKSR2 was observed when the expression of ER and PR was low, and HER2 was high. Consistently, both Smurf2 and CNKSR2 showed an integrated expression in MCF10 breast progression model cell lines. Altogether, our findings reveal that Smurf2 is an important, novel regulator of CNKSR2 and suggest that Smurf2-CNKSR2 interaction may serve as a common strategy to control proliferation of human breast cancer cells by modulating CNKSR2 protein stability.

Keywords: Smurf2, CNKSR2, Ubiquitination, Proliferation, Breast cancer

Major publication appeared in: *Cell Division*

Total no. of pages in the Thesis: 191

Total no. of references cited in the Thesis: 138

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Title: **“Molecular Evaluation of Anticancer Properties of the Active Principle/s from *Wrightia tinctoria*”**

Researcher: Jayesh Antony

Guide: Dr. Ruby John Anto

Subject: Biotechnology

Several drugs currently used in chemotherapy were isolated from plant species or derived from a natural prototype. The present study utilised an indigenous medicinal plant, *Wrightia tinctoria* which was selected due to its various pharmacological and medicinal properties, especially the different beneficial properties related to skin. Extraction and bioactivity-guided fractionation of the leaves of this plant leads to the isolation and identification of a very potential anti-melanoma compound, tryptanthrin. Human malignant melanoma is a highly metastatic cancer that is markedly resistant to conventional therapy, which necessitates the development of new drugs for successfully therapy of this deadly disease. The attempt to find out the mechanism of cell death induced by tryptanthrin revealed that this compound induced apoptosis and G2/M phase cell cycle arrest in the melanoma cells. The study also proved that the anticancer potential displayed by tryptanthrin is through the down-regulation of various transcription factors and survival signals that are over-expressed in melanoma. The pharmacological safety of the compound was also confirmed by using both *in vitro* and *in vivo* assays. Tryptanthrin also possesses significant antitumor property in xenograft model of melanoma and inhibiting metastasis and angiogenesis in experimental animals. Taken together, this study is the first one regarding the anticancer property of *Wrightia tinctoria* and is the first detailed report of extraction and purification of tryptanthrin from this plant. It is also the first study reporting the efficacy of tryptanthrin towards malignant melanoma as assessed by both *in vitro* assays and *in vivo* tumour models. Moreover, this is the first study conducted for the toxicological evaluation of the compound and reporting the antimetastatic potential of the compound.

Major publication appeared in: Scientific Reports

Total no.of pages in the thesis: 245

Total no of references cited in the thesis: 423

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Title: “Molecular Analysis of Mutualistic Interaction between *Centella asiatica* and *Piriformospora indica* and its Effects on Secondary Metabolite Production”

Researcher: Jisha .S

Guide: Dr. S. Manjula

Subject: Biotechnology

Centella asiatica (Indian pennywort) has wide application in Indian and Chinese traditional medicines with documented evidence for wound healing and neuroprotective and anti-aging potential. Asiaticoside, a trisaccharide triterpene, is the most medicinally active compound in the plant. β -Amyrin synthase and squalene synthase have been identified as the two key genes in the triterpenoid pathway which regulate the production of asiaticoside in *C. asiatica*. The paper reports salient findings of our study utilizing the growth-promoting endophytic fungus *Piriformospora indica* to successfully colonize roots of *C. asiatica* *in vitro* cultures for investigating the effect of the mutualistic association on asiaticoside production. Co-cultivation of *P. indica* resulted in the rapid enhancement of root and shoot biomass of host plant, which was visible after 7 days of culture and continued up to 45 days. *P. indica* co-cultivation also favored the synthesis of asiaticosides, as evidenced by HPLC analysis which indicated about twofold increase (0.53% (w/w) in leaves and 0.23% (w/w) in whole plant) over control (0.33% (w/w) in leaves and 0.14% (w/w) in whole plant). Real-time PCR results confirmed the strong upregulation of squalene synthase and β -amyrin synthase transcripts in *P. indica*-challenged plants compared with the control. The effect of *P. indica* colonization was analysed in *C. asiatica* plants maintained *in vitro* at varying P levels in the growth medium. At a P concentration of 125 μ M (10 % of normal) and 62.5 μ M (5 % of normal), significant stimulation of plant growth (maximum at 125 μ M P) and asiaticoside production were observed in colonized plants, which also induced an overproduction of auxin (IAA) and cytokinins (t-ZR). Induction of asiaticoside production in *P. indica* colonized plants under low P conditions coincided with a significant up regulation of asiaticoside pathway gene transcripts. Presence of low P in the media also failed to generate any stress response in the plant in the presence of *P. indica*, which was confirmed by the classical stress indicators like antioxidant capacity assay and H₂O₂ assay. The stimulatory effects of *P. indica* whole cultures on *C. asiatica* growth and asiaticoside production were retained by *P. indica* Cell Wall Extract (CWE). The overall CWE treated plants appears bigger and healthier in comparison to the untreated wild plants, even though the effect was not as pronounced as that observed on cocultivation with *P. indica* whole cultures. Field evaluation studies were conducted for all experiments. Our data demonstrate the potential use of *P. indica* as a means to enhance plant secondary metabolite production in planta.

Major publication appeared in : Mycorrhiza, Vijnana Kairali, Indian Journal of Medical research

Total no. of pages in the thesis: 186

Total no. of reference cited in the thesis: 215

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Title: “DNA fingerprinting and discrimination of the traditional medicinal rice ‘Njavara’ from other traditional rice strains”

Researcher: Mariet Jose

Guide: Dr. George Thomas

Subject: Biotechnology

Njavara (*Oryza sativa* L. landrace Njavara), a rice landrace in Kerala, described in the ancient Sanskrit Ayurveda treatises as *Shashtika*, is both medicinal and nutritive, and is used in Ayurveda treatments and health food preparations over centuries. However, little is known about the genetic relationship between Njavara and other cultivars. The study was undertaken to circumscribe Njavara from other traditional rice cultivars in Kerala and to position Njavara in the global rice gene pool. The genetic relationships between 210 Njavara genotypes and 331 other rice cultivars, amounting to a total of 541 samples, were examined using 60 microsatellite markers. All the loci tested were polymorphic and generated a total of 934 alleles. In UPGMA cluster analysis of allelic data using Powermarker, the 541 samples analyzed were clearly resolved into five distinct clusters corresponding to Njavara, *aus*, *aromatic*, *indica* and *japonica*. Of the 210 Njavara individuals, only 175 individuals were clustered together, while the remaining 35 individuals were clustered with *indica*, and are probably misidentifications. The 175 Njavara individuals were separated into four distinct groups ($F_{st} = 0.54$), mostly in accordance with their glume colour and geographic affinity. To gain a deep understanding of the phylogenetic affinity, 8 representative Njavara accessions were analyzed with 112 samples including 29 *aus* and 47 *O. rufipogon* Griff, the progenitor of cultivated rice using 20 nuclear sequence tagged sites (STS). The Njavara accessions, *aus* cultivars and certain accessions of *O. rufipogon*, especially from north India, were clustered together, while the *O. rufipogon* from Kerala was clustered distantly from this cluster. Thus the study circumscribed and positioned Njavara in the global rice gene pool. Njavara is not endemic to Kerala as believed over centuries, but belongs to *aus* sub-group, which probably was introduced into Kerala, concomitant with the spread of Ayurveda. The genetic analyses also helped to purify Njavara from morphologically close *indica* cultivars.

Keywords: Njavara, rice gene pool, SSR, cluster analysis, STS, phylogenetic affinity

Major publication appeared in: Annals of Applied Biology

Total number of pages in the thesis: 241

Total number of references cited in the thesis: 365

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Title: “Evaluation of molecular defects in polycystic ovary syndrome”	
Researcher : Dr. Meera Krishna .B	Guide : Dr. Malini Laloraya
Subject: Biotechnology	
<p>PCOS is the most common endocrinopathy among adolescent women and is the leading cause of anovulatory infertility. The pathophysiology of PCOS remains poorly understood, and treatment largely empirical. Therefore identification of the complex regulatory networks under any disease condition is imperative to understand its pathology. To unveil the cellular mechanisms involved in PCOS pathogenesis we adopted an approach integrating genomic, proteomic as well as epigenetic platforms. The miRNA expression profiling identified 30 differentially expressed miRNAs in peripheral blood of PCOS patients. Gene expression microarray identified 1092 significantly differently expressed genes (DEGs). Protein expression profiling in peripheral blood mononuclear cells (PBMC) of PCOS women revealed 43 differential proteins. The functional bioinformatic approaches revealed that the differential expressed miRNAs/mRNAs/proteins were involved in endocrine pathways, circadian rhythm, phosphatidylinositol signaling system, regulation of actin cytoskeleton, MAPK signaling pathway, inflammatory response, platelet activation, and autoimmunity pathways. A combined cytoscape plug-in network of the differentially expressed molecules in PCOS suggested the involvement of novel immune/autoimmune networks, cytoskeletal, oxidative stress and angiogenic pathways. In the backdrop of our network results which revealed a differential immune network, we endeavored to explore the autoimmune mechanisms in PCOS. Through FACS analysis during the follicular phase, we discovered a reduction of Tregs in peripheral blood of PCOS v/s control women. rIL2 stimulation experiments indicated towards a delayed IL2 responsiveness in PCOS patients compared to control women. Thus our study implicates an autoimmune aetiology in PCOS pathogenesis. The second major pathway coming from our integrative network was oxidative stress mechanisms which made us focus on the oxidative redox mechanism. Oxidative stress is mainly mediated by reactive oxygen and reactive nitrogen species. The level of NO and H₂O₂ in plasma of PCOS women were found to be significantly reduced in PCOS v/s control women. The reduction in NO can be attributed to the reduction in transcripts of genes important in NO biosynthesis. The aberrant autoimmune and oxidative mechanisms in PCOS can serve as the ‘cues of induction’ of recurrent miscarriages, pregnancy-induced hypertension, and preeclampsia in PCOS women. We underline their potentiality as predictive markers for pregnancy complications and metabolic anomalies in PCOS.</p>	
Major Publication appeared in <i>Journal of clinical endocrinology and metabolism</i>	
Total no. of pages in the thesis:191	
Total no. of references cited in the thesis: 292	
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Title: **“Development and Evaluation of effective inhalable drug delivery system for the treatment of pulmonary tuberculosis”**

Researcher: Mithun V. Varghese

Guide: Dr. G. S. Vinod Kumar

Subject: Biotechnology

Tuberculosis (TB) is one of the deadliest diseases and causes around 2 million deaths (globally) every year. Through aerosol mode, the pathogen (*Mycobacterium tuberculosis*) transmits to healthy individuals. So, the sole port for the entry of pathogen is lung and starts as pulmonary tuberculosis (around 80% of total reports). At this point conventional oral therapy is less efficient and calls for further development in treatment of TB. In many instances, due to lung remodelling and necrotic lesions, the drug reaching the target will be at sub-therapeutic concentration. This results in relapse of the disease and often leads to drug resistance. Delivery systems which can cargo a high pay load of drug to the target or to the vicinity of pathogen will be a method of choice for treating pulmonary tuberculosis. In this thesis, we are putting forward two platform technologies for developing inhalable system against T.B. Anti-TB drug was made into inhalable particles using newly synthesized lipopolymer. The polymer as well as the inhalable system was characterized using suitable *in-vitro* and *in-vivo* methods. In the second approach, we converted the drug alone into inhalable size range by applying cryo-crystal engineering. Later the system was evaluated for physico-chemical properties and also assessed the efficiency to deliver drug to human lung by validated *in-vitro* method. Since we have adopted quality by design approaches (QbD) for developing these technologies, chances for translating to product level is high.

Major Publications appeared in: *Acta Biomaterialia*, *RSC Advances* and *International Journal of Nanomedicine*.

Total number of pages in thesis: 157

Total number of references cited in thesis 276

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Title: “Isolation, Evaluation and Characterization of biocontrol agent for the control of collar rot of *Amorphophallus*”

Researcher: Neetha Soma John

Guide: Dr. R. S. Misra

Subject: Biotechnology

Amorphophallus paeoniifolius (Dennst.) Nicolson commonly called as elephant foot yam (EFY) is widely cultivated for its edible tubers. Among the various field diseases, the collar rot disease is the most destructive caused by *Sclerotium rolfsii* causing a yield loss of 20 - 100%, remains a challenge in terms of management. The use of microbial biocontrol agents offers a promising alternative to chemical pesticide. With this view, the aim of this research work was formulated to identify an efficient biocontrol agent for the control of collar rot of *Amorphophallus*, caused by *S. rolfsii*. In the present study, prescreening by dual culture of a total of 1232 microbial isolates collected revealed that most of the *Trichoderma* strains could inhibit *S. rolfsii*. So 10 representative isolates of *Trichoderma* spp. showing variable inhibition *in vitro* were selected for morphological, molecular and biochemical characterization. Strains with the best *in vitro* antagonistic capacity were *Trichoderma harzianum* (Tr9) and *Trichoderma asperellum* (Tr10). Pot trials when conducted with Tr9 and Tr10 showed a comparative success of Tr9 in managing collar rot disease of elephant foot yam. Field trial revealed that the potential of Tr9 to control collar rot was on par with the control by chemical fungicide, bavistin. Mycoparasitism, metabolite production profile and induction of defense compounds in *Amorphophallus* by this potent isolate was evaluated and validated. Genes differentially expressed in Tr9 on interaction with *S.rolfsii* was analyzed by cDNA RAPD and subtractive hybridization. In general, these genes are involved in mycoparasitism of the pathogen to degrade its cell wall, to metabolize its constituents, but also to provide the energy needed for an induced synthesis and eventually to compete with the metabolic rate of *S.rolfsii*. Further, the expression of some mycoparasitic genes during pre-contact, contact, and after contact phase with *S.rolfsii* was monitored by. Thus, the study led to selection of a reliable biocontrol agent that could offer collar rot disease control on par with the chemical fungicide with a clear understanding of the biocontrol process of *T. harzianum* against the collar rot pathogen of elephant foot yam.

Keywords: Elephant foot yam, *Trichoderma harzianum*, *Sclerotium rolfsii*, biocontrol, characterization

Major publication appeared in: Biological Control

Total no.of pages in the thesis:189

Total No.of references cited in the thesis: 303

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Title : “POLY (L) LACTIDE : SYNTHESIS AND BIODEGRADATION”	
Researcher : Nimisha R. Nair	Guide: Dr. K. Madhavan Nampoothiri
Subject : Biotechnology	
<p>The public's growing awareness for a cleaner environment has raised a lot of expectations from biopolymers as an alternative to replace petroleum-based plastics. The objective of this study was to develop a biodegradable plastic from the starch entrapped in jackfruit seed powder, a potential low cost starchy agro residual substrate. A single step conversion of the entrapped starch present in the jackfruit seed powder to L-lactic acid is demonstrated employing newly isolated amyolytic Lactic acid bacteria, <i>Streptococcus equinus</i>, a homofermentative lactic acid producer. The presence of lactic acid in fermentation broth as well as in the purified sample was confirmed by HPLC and purified lactic acid was used for synthesis of polylactic acid by direct condensation polymerization method. Finally, a consortium of four potent PLA degrading microbes (<i>Penicillium chrysogenum</i>, <i>Cladosporium sphaerospermum</i>, <i>Serratia marsescens</i>, <i>Rodotorulla mucileginosa</i>) was formulated and also conducted composting studies for PLA degradation. As the use of PLA is expected to increase in the future, the information obtained from this study will be very useful in the evaluation of the degradability of PLA as well. Attempts were made for blending PLA with other polymers to improve its thermal properties and biodegradability and also synthesized PLA-curcumin nanoparticles without losing the antimicrobial properties of curcumin.</p>	
Keywords: Biopolymer, Lactic acid, PLA, jackfruit seed powder, biodegradation.	
<p>Major Publication appeared in: <i>Bioresouce technology, Indian Journal of Microbiology, Biotechnology Letters.</i> Total no: of pages in the thesis: 226 Total no: of references cited in the thesis: 323 Email of the researcher: nimishanair63@gmail.com</p>	

Title : “DELINEATION OF GENES ASSOCIATED WITH REMODELING OF EXTRACELLULAR MATRIX AND ENDOTHELIAL DYSFUNCTION IN INTRACRANIAL ANEURYSM”

Researcher : Sanish Sathyan

Guide: Dr. Moinak Banerjee

Subject: Biotechnology

Subarachnoid Haemorrhage (SAH) accounts for 15% of strokes, but occurs at a fairly young age. Intracranial aneurysm (IA) accounts for 85% of SAH. In general population, 2-3% of individuals are likely to harbour IA and the aggregate worldwide incidence of aneurysmal SAH (aSAH) is 10.5 cases per 100,000 person-years. Familial occurrence and identical location for aneurysm formation in twins have been reported. A case-control study design was used to search for the selected genetic polymorphisms with IA. The study populations consisted of 225 radiologically confirmed aneurysmal cases and 250 ethnically and age matched controls from Dravidian Malayalam speaking population of Kerala. The objective of this study was to decipher the roles of genes involved in extracellular matrix (ECM) remodelling, endothelial dysfunction and immune response in conjunction with environmental risk factors involved in pathogenesis of IA. We could observe significant association with *COL1A2*, *MMP2* and *VCAN* of ECM remodelling genes and *TNF* gene of inflammatory pathway. Gene's involved in endothelial dysfunction was not associated with IA. GWAS hotspot 9p21 region harbouring lncRNA *ANRIL* was found to be associated with IA in this population. We also report associated genotype dependent expression of lncRNA *ANRIL*. This is the first study of its kind from Indian subcontinent shedding light on the genetics of IA. Our study strongly provides evidence for population specific indicators for risk factors in IA. We demonstrate that genetic factors in conjunction with environmental risk factors play crucial role in the pathogenesis of IA in South Indian population.

Major Publication appeared in: Journal of Neuroinflammation, Molecular Biology Report, Metagene

Total no of Pages in Thesis: 263

Total Number of reference cited in the thesis: 506

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Title: “Clinical Relevance Of Cytogenetics And Molecular Studies In Patients With Acute Myeloid Leukemia”	
Researcher: Santhi .S	Guide: Dr. S. Hariharan
Subject: Biotechnology	
<p>Acute myeloid leukemia (AML), the most common leukemia in adult is a disease with marked heterogeneity in both response to therapy and survival. The pathogenesis of AML involves an array of molecular alterations that disrupt almost every facet of cell transformation. Chromosomal studies and molecular mutations are an important prognostic indicator for predicting outcome of AML as this is associated with prognosis and therapy. In addition to mutations, polymorphism of certain genes especially detoxification enzymes coding genes and DNA repair genes causes inter individual differences which contribute to leukemia. The current study attempts to investigate the Chromosomal abnormalities, molecular genetic alterations and polymorphisms associated with certain target genes and to determine the influence of variant genotypes, in AML susceptibility risk, survival status and prognostic significance in AML patients. The study was performed in Peripheral blood and / or bone marrow samples of 284 clinicopathologically confirmed AML patients, after getting informed consent. Cytogenetic analysis has identified various non-random chromosomal aberrations. Recurrent translocations were detected in 20%, normal karyotype 54%, numerical, other structural abnormalities & complex karyotype in 18%, karyotype failure in 8% of cases. FLT3, N-RAS and CEBPA mutation were detected in 24.3% (67/276), 8% (21/264) and 18% (45/248). c- KIT was detected in 1.6% of cases. The combined RTK mutation showed predominance in the normal karyotype. CEBPA mutation and polymorphism were observed to be equivalent. Survival analysis showed a distinct survival pattern for the different cytogenetic groups. Molecular analysis revealed a more effective prognostication, showing a decreased survival pattern for the FLT3 and N-RAS mutated cases. CEBPA mutation contributes to a better prognosis. The predominance of these mutations in normal karyotype itself shows the importance of a broad application of molecular assays in AML. Polymorphism studies showed association of xenobiotic metabolizing enzymes and DNA repair genes with the onset of the disease. This shows the multiple pathways involved in the pathogenesis of AML. The enormous molecular heterogeneity of the disease makes it a prime importance to study these markers and to evaluate their interaction and their precise prognostic value that allow the definition of patient subgroups (favorable risk, standard risk and unfavorable risk) that help in the clinical management of AML.</p>	
<p>Major publication appeared in : Annals of Saudi medicine, Asian Pacific Journal of Cancer Prevention, Middle East Journal of Cancer. Total no.of pages in the thesis: 327 Total no.of reference cited in the thesis: 392 Email of Researcher: sarojamsanthi@gmail.com</p>	

Title: “ INTERSECTION OF GENETICS AND EPIGENETICS IN SCHIZOPHRENIA ”	
Researcher: Saradalekshmi .K .R	Guide: Dr. Moinak Banerjee
Subject: Biotechnology	
<p>Gene Environment interaction forms the basis of etiology of all complex disorders. Epigenetic modifications mediate this gene environment interaction. Among various epigenetic interactions DNA methylation is the most studied epigenetic mechanism. Aberrations in DNA methylation at whole genome and at gene specific levels have been implicated in Schizophrenia. Reproducibility of observations from methylation studies is questionable as DNA methylation is a dynamic process that is influenced by various factors including diet, age, prenatal nutrition etc. Furthermore, it has been found that there are population specific differences in methylation levels. This study is the first of its kind to have analysed the role of variants in various genes involved in the maintenance and regulation of DNA methylation and its association with Schizophrenia. The results from this study indicates that genetic variants in DNA methyltransferases, particularly <i>DNMT1</i> and the variants in folate pathway like <i>MTR</i>, <i>MTRR</i> and <i>SHMT</i> were significantly associated with an increased risk of developing Schizophrenia. We also report an association of these variants with individual symptoms of Schizophrenia. Our study supports the epigenetic origin of Schizophrenia and our observations might be crucial in addressing and understanding the genetic control of methylation level differences from ethnic viewpoint. Further we suggest that while addressing the alterations in methylation events contributing to Complex disorders, it is important to evaluate the underlying genetic variants in methyltransferases and methionine cycle to understand the reasons for differential methylation.</p>	
<p>Major Publication appeared in: PLOS ONE</p> <p>Total No. of pages in the thesis: 241</p> <p>Total No. of References cited in the thesis: 391</p> <p>Email of the Researcher: lekshmisarada@gmail.com</p>	

Title: “Characterization of Fodrin as a Gamma-Tubulin Associated Protein”	
Researcher: Shashikala .S	Guide: Dr. Suparna Sengupta
Subject: Biotechnology	
<p>Thesis summary: γ-tubulin, the newer member of the tubulin superfamily, is known to mediate microtubule nucleation from the centrosome of eukaryotic cells with the aid of some other proteins. It is present in both cytoplasm and centrosome. The major amount of γ-tubulin is believed to be located in the centrosome before the onset of mitotic division. Before centrosome maturation prior to mitosis, gamma tubulin concentration increases dramatically in the centrosome, the mechanism of which is not known. However, a considerable amount has been found in the cytoplasm in the form of a complex whose function is not well known. Microtubules are most abundant in brain tissues and brain microtubules have been extensively used in many in vitro studies. Thus, it is relevant to use brain tissue to characterize cytoplasmic γ-tubulin complex. Here we show that cytoplasmic γ-tubulin, in brain tissues exists as a ring complex as in other tissues. Interestingly, along with the common members of the γ-TuRC reported from several tissues and species, the purified brain cytoplasmic complex contains some high molecular weight proteins including α and β non-erythroid spectrin/fodrin which are not found in other tissues. Immunohistochemical studies of brain tissue sections also show the co-localization of γ-tubulin and non-erythroid spectrin/fodrin. The major role of erythroid spectrin is to help in the membrane organisation and integrity. However, fodrin or non-erythroid spectrin has a distinct pattern of localisation in brain cells and evidently some special functions over its erythroid counterpart. Further in this study, we show that fodrin and γ-tubulin associate together in both the cytoplasm and centrosomes in all brain cells except differentiated neurons and astrocytes. Immunoprecipitation studies in purified centrosomes from brain tissue and brain cell lines confirm that fodrin and γ-tubulin interact with each other in centrosomes. Fodrin dissociates from centrosome just after the onset of mitosis, when the concentration of γ-tubulin attains a maximum at centrosomes. Further it is observed that the interaction between fodrin and γ-tubulin in the centrosome is dependent on actin as depolymerisation of microfilaments stops fodrin localization. Image analysis revealed that γ-tubulin concentration also decreased drastically in the centrosome under this condition. This indicates towards a role of fodrin as a regulatory transporter of γ-tubulin to the centrosomes for normal progression of mitosis.</p>	
<p>Major publications appeared in:</p> <ol style="list-style-type: none"> 1) PLOS One. 2013 Oct1; 8(10), Impact Factor: 4.0 2) Journal of Cellular Biochemistry.2010 Aug 15; 110(6):1334-41. Impact Factor: 3.1 <p>Total No of Pages in Thesis: 155 Total No of references in Thesis: 360 Email of the Researcher: shashikala.sasidhran@gmail.com</p>	

Title: “Biochemical and Molecular Investigation of Haemagglutinin-Neuraminidase Envelope Glycoprotein Involved in Newcastle Disease of Chicken”

Researcher: Tincy K. Thomas

Guide: Dr. A. Jayakumaran Nair

Subject: Biotechnology

Poultry industry in our country suffers from a number of constraints which result in heavy losses and corresponding low levels of productivity. Overcoming these constraints could substantially increase productivity which would contribute to the economy of the country. One of the principal constraints to increasing poultry production is Newcastle Disease (ND). This acute viral disease can typically kill up to 80 percent of unprotected poultry in rural areas and is found throughout the developing world. We have characterized one of the glycoprotein of the causative agent of this disease, Newcastle Disease virus, which play main role in its infection as well as pathogenicity. Newcastle disease virus is an infectious ailment of poultry that manifests itself in severe respiratory and nervous conditions which is about 100 – 200 nm in diameter and is classified as avian paramyxovirus type 1. The study included the propagation of Newcastle disease virus (NDV) and its further characterization using different methods. The infection of the virus in Chick Embryo Fibroblast cells and further analysis was done on its infection. The virulence variation in the strains was studied using plaque assay method. The biochemical characterization of the protein was done using different methods of studying the neuraminidase activity. The polyclonal antibodies were raised against NDV K for the detection and characterization of NDV and further analysis in expression studies. The gene of hemagglutinin neuraminidase protein was cloned and expressed and was proved to use as a vaccine antigen.

Key words: Newcastle Disease Virus, Hemagglutinin Neuraminidase protein, poultry, polyclonal antibodies

Total No.of pages of the thesis: 270

Total No of references cited in the thesis: 280

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Title : “Isolation, Characterization and Therapeutic Interventions of Breast Cancer Stem Cells from *BRCA1*-defective breast cancer”

Researcher : Veena Somasundaram

Guide : Dr. Priya Srinivas

Subject : Biotechnology

BRCA1 is a multifaceted protein that is a cardinal transcription factor, DNA-damage repair protein and regulator of normal mammary gland differentiation. BRCA1-defect/mutation predisposes 70-80% carriers to early onset, aggressive breast and/ or ovarian cancers. The BRCA1-defect could also arise from a functional deficiency of BRCA1 due to hyper-methylation of its promoter and this accounts for 30-40% cases outside hereditary cancer. The treatment regimen employed for these cancers involves prophylactic mastectomy and oophorectomy, followed by radiation therapy as well as chemotherapy by the use of platinated drugs; mostly DNA intercalators. However, there exists a serious problem of relapse and therapy resistance, which recent studies have attributed to Cancer Stem Cells (CSCs). This work explores the features of CSCs from BRCA-defective breast cancer lines and studies how they differ from other BCSCs and how they can be targeted. This study has made the novel finding that mammospheres derived from *BRCA1*-defective cancer cells predominantly express stem cell markers in comparison to the Epithelial- Mesenchymal Transition markers expressed by BCSCs from *BRCA1*-competent cancer cells. Additionally, this study finds ALDH1 positivity to be the best marker for the identification and isolation of BCSCs from BRCA1-defective breast cancer cell lines and also that the CD44⁺/24^{-low} profile does not faithfully represent BCSCs. BRCA1 status is a determinant of the percentage occurrence of the epithelial-like (ALDH1⁺) or mesenchymal-like (CD44⁺/24^{-low}) BCSCs within breast cancer cell lines because the reconstitution of a full length, wild type BRCA1 in HCC1937 breast cancer cells (5382insC mutation in BRCA1) makes them more mesenchymal. Plumbagin, a naturally occurring naphthaquinone could successfully target basal-like BCSCs, wherein the BCSCs derived from the cells possessing a reconstituted BRCA1, show an enrichment of ALDH1⁺ cells upon PB treatment while the BRCA1-defective HCC1937 cell lines show a robust downregulation of ALDH1 positivity after treatment with PB. An increased membrane localization of the drug efflux pump ABCG2 observed in spheres derived from HCC1937/wt BRCA1 cells treated with PB could be responsible for the treatment related enrichment of CSCs (ALDH1⁺). A diffuse cytoplasmic expression of ABCG2 (indicative of non-functional protein) is observed in the spheres derived from HCC1937 that are susceptible to PB treatment as evidenced by reduction in ALDH1⁺ cells. This study also interestingly found that ability of plumbagin to target CSCs as evidenced by reduction in cells expressing stem cell, EMT and mesenchymal markers in ovarian cancer xenografts is not restricted by functional BRCA1.

Total no. of pages in the thesis : 140

Total no. of references cited in the thesis : 180

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Title: “Role of avirulence gene products and biocontrol agents for the management of leaf blight disease in taro caused by *Phytophthora colocasiae*”

Researcher: Vishnu S. Nath

Guide: Dr. Vinayaka Hegde

Subject: Biotechnology

Co-guide: Dr. M. L. Jeeva

Taro (*Colocasia esculenta* (L.) Schott) is a major root crop of the family Araceae with wide distribution in the tropics. The taro plant is a rich source of carbohydrates, proteins, minerals and vitamins and has medicinal properties to reduce tuberculosis, ulcers, pulmonary congestion and fungal infection. Leaf blight caused by *Phytophthora colocasiae*, a hemi-biotrophic oomycete plant pathogen, is the most destructive disease of taro causing yield loss of up to 50%. The current study attempts to develop durable and environment friendly strategies to manage leaf blight disease using a polyphasic approach. To know more on the pathogen, phenotypic and genotypic diversities in the *P. colocasiae* isolates obtained from major taro growing regions of India were analyzed. Results revealed considerable phenotypic and genotypic diversity and the isolates could be classified into nine morphological groups. A conventional and real-time PCR assay was developed and standardized from regions of the RAS-related protein (*Ypt1*), G protein alpha-subunit (*GPA1*) and phospho-ribosylanthranilate isomerase (*TRP1*) genes for early, sensitive and specific detection of *P. colocasiae*. Eighteen *Trichoderma* strains isolated from soils of different regions of India were characterized using a combination of phenotypic and molecular approaches for their biocontrol potential against *P. colocasiae*. The most potent strain overall (TR7) identified as *T. harzianum* could be used as a promising candidate for biological control of taro leaf blight. A cDNA library enriched for upregulated *P. colocasiae* genes during infection on taro were generated using suppression subtractive hybridization (SSH) approach. Sequence analysis of these genes classified them into various biological, molecular and cellular processes. Reverse transcriptase quantitative PCR (RT-qPCR) assay of selected *P. colocasiae* genes showed an increased expression of these genes during the infection process. The information generated in this study would be a stepping stone for future works in this field and also aid in developing an appropriate control strategy for managing taro leaf blight disease.

Keywords: Phenotypic characterization, Molecular diversity, PCR detection, Differential gene expression, Biological control

Major publications appeared in: FEMS Microbiology Letters, European Journal of Plant Pathology, Physiological and Molecular Plant Pathology, Annals of Microbiology, 3Biotech

Total no. of pages in the thesis: 291

Total no. of reference cited in the thesis: 346

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Stream: Science & Technology

Subject: *Organic Chemistry*

Title : “DESIGN, SYNTHESIS AND STUDY OF PHOTOPHYSICAL AND SELF-ASSEMBLING PROPERTIES OF SOME C₃- SYMMETRIC DONOR-ACCEPTOR MOLECULES”

Researcher: Deepak D. Prabhu

Guide: Dr. Suresh Das

Subject: Organic Chemistry

In recent years there has been a significant interest in developing liquid crystals and low molecular weight organogels based on disc shaped or C₃- symmetric molecules. Because of their shape anisotropy, these molecules usually tend to self-organize into a one dimensional columnar arrangement which imparts them with unique functional properties such as the ability to efficiently conduct charge and energy in a highly anisotropic manner making them useful materials as conducting molecular wires for a variety of applications. In the present thesis we have developed some novel 1, 3, 4-oxadiazole based donor-acceptor C₃- symmetric molecules possessing different alkyl chain lengths and studied their influence on the photophysical and self-assembling properties in solution as well as in the bulk state. We have also developed some C₃-symmetric molecules with increased donor-acceptor strength by introducing thiophene and triphenylamine chromophores. Interestingly we found that these molecules self-assembles in different solvents resulting in the formation of organogels with different optical properties. Detailed photophysical studies in the solution and solid state revealed a difference in the interaction of solvent molecules with the gelator molecules resulting in the preferential formation of particular type of aggregate which in turn resulted in different optical properties in solution and solid state

Major publication appeared in: J. Phys. Chem. B 2012, 116, 13071 and J. Mater. Chem. C, 2014, 2, 7039

Total number of pages in the thesis: 147

Total number of reference cited in the thesis: 191

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Stream: Science & Technology

Subject: *Engineering*

Title : “INDUCTION MACHINE AS A GENERAL PURPOSE PRIME MOVER BY CHARACTERESTICS’ CONTROL”	
Researcher: Dr. Nisha .G .K	Guide: Dr. Z. V. Lakaparampil
Subject: Electrical Engineering	Co-Guide: Dr. S. Ushakumari
<p>Synopsis: Propulsion system used in applications like electric vehicle, rolling stock and industrial floor material movement etc., requires high torque at low speeds for starting and climbing and nearly constant power at high speeds. The characteristic for propulsion is achieved in DC series motor through construction and applying variable DC voltage. Traditionally induction motors are designed for grid applications. Recent development of solid state power switching devices and the evolution of programmable high speed digital controllers enabled them to find a prominent place in variable speed applications where torque-speed characteristics can be nearly DC series machine like. Modification in design has to be carried out to change the behavior of Induction motor along with a suitable controller to suit propulsion requirements. The objective of this research is to investigate the characteristic control of induction motor for a propulsion drive system. In order to reach this objective, first a simulation model for Space Vector Modulated Voltage Source Inverter is developed which is highly flexible due to its instant capability to control voltage magnitude and angle in sub-cycle, can also operate over a wide range of frequency. The fundamental operation of induction motor based on Field-Oriented Controller is addressed. FOC is the commonly preferred high-performance induction motor drive system which has the benefits such as wide range of speed control, precise speed regulation and fast dynamic response. Motor model is designed for Model Reference Adaptive System using Sliding Mode Controller, which has the advantage of disturbance rejection, insensitivity to parameter variations, reduced order modeling of plant dynamics and avoiding re-tuning gains compared to traditional PI controllers, for sensorless operation. By adopting MRAS-SMC, the rotor speed and rotor fluxes are estimated simultaneously. Mathematical models for FOC induction motor with and without sensors are developed and the performance of drive systems are validated up to base speed region. Field Weakening algorithm is introduced in the above model to extend the operation from base speed region to FW region. The desired characteristics for a propulsion system can be easily obtained by field weakening control of the motor by which the motor speed can be increased above the rated speed. The performance of the developed drive systems with and without sensor using MRAS-SMC speed estimator are validated within base speed and in FW regions in which the speed is increased up to four times the rated speed. The torque-speed responses are analyzed in the four-quadrant operation, which is desirable for propulsion application. The design modification of induction motor is carried out to get the desired characteristics by changing the magnetizing current. For higher magnetizing current, the FW region can be extended further, which is more desirable for propulsion applications. Simulations are carried out for different magnetizing current by varying design parameters of the induction motor and torque-speed characteristics are observed. It is resolute from the simulation results that developed induction motor drive model can confer torque-speed characteristics ideal like a DC series machine for propulsion applications.</p>	
Keywords: Field-Oriented Controller, Model Reference Adaptive System, Sliding Mode Controller, Field Weakening	
Major publications appeared	
<ol style="list-style-type: none"> 1. <i>Transactions on Engineering Technologies (Springer publication)</i> 2. <i>International Review of Modeling and Simulations</i> 3. <i>IAENG International Journal of Computer Science</i> 4. <i>International journal of Advanced Electrical Engineering</i> 5. <i>International Conference on Advances in Engineering and Technology (ICAET'2014), Singapore.</i> 6. <i>7th World Congress on Engineering (WCE'2013), Imperial College, London.</i> 7. <i>IEEE International Conference on Control Communication and Computing (ICCC'2013).</i> 8. <i>International conference on Advance Engineering Technology(ICAET'13), Mysore.</i> 9. <i>IEEE International conference on Green Technology (ICGT'12), Thiruvananthapuram.</i> 10. <i>IEEE International conference on Power, Control and Embedded Systems (ICPES'12), Allahabad.</i> 11. <i>Lecture Notes in Engineering and Computer Science: Proceedings of the International Multi-conference of Engineers and Computer Scientists 2012, (IMECS 2012), Hong Kong.</i> 12. <i>International conference on Emerging Technology, Trends on Advanced Engineering Research, Kollam</i> 	
Total number of pages in Thesis: 187	
Total number of Reference cited in the Thesis: 167	
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Title: “PREVENTING DENIAL OF SLEEP ATTACK IN SENSOR NETWORK”	
Researcher: Dr. Manju .V.C	Guide: Dr. M. Sasikumar
Subject : ECE	
<p>Wireless technology has been the boon to the sensor networks. It has advanced significantly to a powerful and secured tool for almost all areas. Wireless sensor network is a self-configured, infrastructure less wireless network consisting of a large number of sensor nodes equipped with specialized sensors that can monitor various physical attributes such as temperature, pressure, vibration and sound. WSN relies on hardware simplicity to make sensor field deployments both affordable and long lasting without any maintenance support. Security and energy efficiency is the most important concerns in wireless sensor networks (WSNs) design. With commercial and heavy scale involvement the wireless sensor network grew more application specific and efficient. The sensor nodes are deployed in remote locations with a definite power source for the reception and transmission of data. The nodes form a path among themselves to channel the data from sender to receiver. The process of sensing data, authenticating it and forwarding to the next node is basic algorithm of every sensor node. The wireless sensor networks are susceptible to the power losses and many adversities due to their wireless nature. Also, they are affected by the various types of attacks that focus to steal the data from the network. Various security mechanisms are applied to mitigate these attacks. The sensor nodes working on a limited power source are required to conserve energy to operate for a longer period. Once the battery is exhausted the node becomes useless. With the advancement in techniques the attacks on the sensor nodes not only now focuses to steal the data but they are more intended to disrupt the communication by engaging the nodes of a given network. These attacks directly affects the sleep time of node and results in high battery consumption at node end. This type of attack is termed as “Denial of Sleep” attack.</p> <p>The “Denial-of-Sleep” attack affects not only the physical layer but also the data link layer of the node. The attack is the combination of jamming attack: that keeps the receiver of sensor busy in receiving bogus signal at the expanse of battery, replay attack: the attacker senses the previous traffic and re-transmits into the network (the signals can reach the destination if no security mechanism is applied) and link layer attacks. In this thesis we focus our concentration on the classification of the Denial-of-Sleep attacks as the jamming, link layer and the replay attack. We discuss their structure and their approach of attack in the network. Finally we modify some of the previous methods and propose a new novel method “Anti Sleep Energy Efficient Algorithm” (ASEEA) for the mitigation of these attacks. We present the proposed solution on the MATLAB and the NS2 platforms to test the simulation parameters. Finally we present the comparison of the received results with the previous algorithms studied in literature review and followed by the conclusion of our work.</p> <p>Keywords : Wireless Sensor Networks, Wireless, Denial of Sleep, Media Access Control</p>	
<p>Major Publication appeared in: CSI Journal of computing Total no of pages in the thesis: 202 Total no of reference cited in the thesis: 129 Email of Researcher: manju_tvm@yahoo.com</p>	

Title: “Study & Analysis of Satellite Images for the Extraction of Structural Features”	
Researcher: Lizy Abraham	Guide: Dr. M. Sasikumar
Subject: Electronics & Communication Engineering	
<p>A number of methods have been developed for feature extraction from high resolution satellite imagery available in spatial and spectral domains. Most existing methods are based on knowledge base, which is not derived automatically. But since these rules are developed by an observer, the methods are not well suited for all types of images. Some existing methods are based on spatial images and some other methods are based on spectral images. A comparative study is not yet done to justify which one is better for efficient and accurate detection of each structural feature. The type of satellite images provided by different imaging sensors varies widely depending on spatial and spectral resolutions which make the process of feature extraction more complicated. In this work, various techniques have been proposed for the automatic extraction of shadows, clouds, roads, buildings and bridges using different types of satellite images. For all feature extraction problems discussed in the thesis, algorithms developed using spatial images as well as spectral images are analyzed and from the results inferred we have come to the conclusion that which one is better for efficient and accurate detection of each structural feature. The results of the proposed work are also compared with existing techniques. The authors have made an effort to combine these algorithms to find a generalized procedure for the structural feature extraction process.</p>	
<p>Keywords: Multispectral, Panchromatic, Automatic, Vegetation, Water, Roads, Buildings, Bridges, Clouds, Shadows, Feature Extraction.</p>	
<p>Major Publication appeared in: IETE Journal of Technical Review, LAP LAMBERT Academic Publishing</p>	
<p>Total no. of pages in the thesis: 170</p>	
<p>Total no. of references cited in the thesis: 208</p>	
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Title: “Development of Advanced Finite Elements for Aerospace Applications”	
Researcher: R. Marimuthu	Guide: Dr. B. N. Rao
Subject: Mechanical Engineering	
<p>Increasing interest in design and development of high performance space flight vehicles at a reasonably low cost has brought the attention to the advances in materials, advanced high performance structural design concepts utilizing maximum potential of material, development of rigorous analysis techniques, manufacturing techniques and new concepts in propulsion systems. Some interesting studies are made in this thesis on one of the above challenging tasks related to the development of advanced finite elements for aerospace applications. Hybrid-stress-displacement elements as well as a family of Herrmann elements are developed for structural integrity analysis of solid propellant rocket motors. Following the concepts of the fluid-structure interactions an efficient finite element is developed useful for studying the dynamic characteristics of liquid tankages in a typical launch vehicle. A special 20-node brick element having three-translations and three-inter-laminar stresses as degrees of freedom is developed for accurate evaluation of inter-laminar stresses in composite structures. A 20-node brick element having three-translations and a potential as degrees of freedom is developed to model structures with active devices, sensors and actuators. A piezoelectric bimorph beam is analyzed for the specified voltage across the thickness and the finite element results are compared with existing test results. All these advanced finite elements are tested by solving several problems prior to their implementation in the in-house developed FEAST (Finite Element Analysis of Structures) software package.</p>	
<ol style="list-style-type: none"> 1. R. Marimuthu, B. Nageswara Rao, “Development of efficient Herrmann finite elements for structural integrity analysis of solid rocket motor propellant grains” , International Journal of Pressure Vessels and Piping, Vol.111-112, PP 131-145(2013) 2. R. Marimuthu, B. Nageswara Rao, “An efficient finite element technique to study the free vibration characteristics of liquid tankages”, Meccanica, DOI 10.1007/s11012-014-0086-8 (December 2014). 3. R. Marimuthu, B. Nageswara Rao, “Interlaminar stresses of cross-ply laminate subjected to axial and transverse loading by mixed finite element method”, Canadian Journal of Basic and Applied Sciences, Vol.2, No.3, pp.64-75 (2014). 	
Total No of Publications: 14	
Total No of Pages: 122	
Total No of References: 92	

Title : “Fault Detection and Diagnosis of Three Phase Induction Motor Drive using Fuzzy Logic”

Researcher : Mini .V .P

Guide: Dr. S. Ushakumari

Subject : Electrical and Electronics Engineering

In this research, an attempt is made to detect and diagnosis faults effectively in a voltage source inverter fed three phase induction motor drive system. Faults in a voltage source inverter fed three phase induction motor are mainly divided into two categories viz. converter faults and machine faults. The fault detection techniques are classified into three groups viz. model based fault detection, knowledge based fault detection and signal based fault detection. Extensive literature survey has been carried out to understand various types of induction motor drive system faults and available detection techniques. It is observed that the model based fault detection techniques are usually applied to detect various types of induction motor faults. In these available method, quantitative mathematical model of specified system is required, which is time consuming. In this thesis, knowledge based fault detection technique, the qualitative model of the specified system is used for detection instead of quantitative model. Fault detection technique using fuzzy logic algorithm fall under the knowledge based fault detection technique, fuzzy logic based fault detection techniques are used in the present work for detection of various faults in induction motor drives as added advantages of fuzzy logic could be utilized. MAXWELL-2D software is used to develop the three phase squirrel cage induction motor based on motor design specifications. The work carried out in this thesis for detection and diagnosis of fault using fuzzy logic algorithm is applicable to any industry for their particular applications. Observations, conclusions and recommendations for further improvement are also explained in this thesis.

Major publication : AMSE International Journal 2012 & 2014, IEEE International Conference Russia 2010, Kerala 2011 and Allahabad 2012

Total No. of pages in the thesis : 248

Total no. references cited in the thesis: 145

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Title: “Development of Criteria for Evaluation and Selection of Materials for Structural Repair of Reinforced Concrete elements”

Researcher: Radhakrishnan .R (Kottappurathu)

Guide: Dr.V. Syam Prakash

Subject: Civil Engineering

The selection of materials for repair of Concrete structures is currently being done by engineers, mainly based on the data, pertaining to engineering properties, provided by the manufacturers. This information on performance of repair materials is based on testing done in western countries for their climatic conditions. The performance of these materials may not be adequate in a different climate. Moreover the claims by manufacturers on the performance of repair materials in many cases were observed to be non realistic and the information provided were incomplete. Also there are numerous materials of different brands available in the market, making the selection a difficult task. Therefore the quality assurance of a repair material is to be done based on performance evaluation by tests that are appropriate to tropical climatic conditions. The present study consists of a field survey to assess the repair needs and has developed a test method called Modified Bond Wrench test, as well as performance criteria, as applicable to tropical climate. This test can be successfully used for testing substrate-to-repair bond strength, thereby evaluating the performance of repair materials . Acceptable correlations have been obtained between: (i) beam flexure test results and Modified bond wrench test results and (ii) splitting cylinder test results and Modified Bond wrench results. Testing of various polymer based materials showed that concrete repairing using epoxy bonding agent and SBR modified concrete gave the highest performance in bond durability under tropical climate. The other tests developed are for repair-to-steel bond strength, durability in thermal cycles and marine conditions.

Keywords: Concrete repair, performance evaluation, substrate-to-repair bond, durability, bond strength

Major publication appeared in: Indian Concrete Journal and International Journal of Advancements in Research and Technology

Total Number of pages in the thesis: 168

Total number of reference cited in the thesis: 107

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Title: “Performance Enhancement of Power System Stabilizer through Biologically Inspired Optimization Techniques”

Researcher: Sheeba .R

Guide: Dr. M. Jayaraju

Subject: Electrical Engineering

Power Systems are large, complex systems covering vast areas such as national/international grids. It consists of many processes whose operations need to be coordinated and have complex modes of instability. Automatic voltage regulators (AVRs) help to improve the steady-state stability of power systems. But with the creation of large, interconnected power systems, another concern was the transfer of large amounts of power across extremely long transmission lines. The addition of a supplementary controller in the control loop, such as the introduction of power system stabilizers (PSS) to the AVRs on the generators, provides the means to reduce the inhibiting effects of low frequency oscillations. The conventional power system stabilizers work well at the particular network configuration and steady state conditions for which they were designed. Once conditions change the performance degrades. The conventional power system stabilizer such as lead-lag, proportional integral (PI) power system stabilizer, proportional integral derivative (PID) power system stabilizer operates at a certain point. So the disadvantage of this type of stabilizer is that they cannot operate under different disturbances with different operating conditions. The above mentioned problem can be overcome by PSS design based on biologically inspired optimization techniques/soft computing techniques. The modelling and analysis of Static Var Compensators (SVC) for small signal stability enhancement is also included in this work. An ample assessment of the effects of the PSS and SVC based control when applied independently and also in a coordinated application platform has been carried out. The recent biologically inspired optimization algorithms such as Genetic Algorithm(GA), Particle Swarm Optimization (PSO), Ant Colony Optimization (ACO) and Bees Algorithm are employed to search the optimal parameters of PSS and SVC.

Major publications appeared in

1. Electric Power Components and Systems, Taylor and Francis, accepted for publication in online on June 2014.
2. IJARET, Volume 4, Issue 5, pp. 24-34, July – August 2013.
3. International Review on Modelling and Simulation (IREMOS), October 2012.

Total number of pages in the thesis: 241

Total no. of reference cited in the thesis:124

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Title: “Study on the abundance and distribution of heavy metals in an aquatic system”

Researcher: Swarnalatha .K

Guide: Dr. J. Letha

Subject: Engineering

Co-Guide: Dr. Ayoob .S

This study was concentrated on the distribution, enrichment and risk analysis of heavy metals in Akkulam Veli Lake, an urban shallow lake in Thiruvananthapuram, the capital city of Kerala. Heavy metal concentrations (Cr, Co, Ni, Cu, Zn, Pb, Fe, Mn, As, Cd and Hg) in the lake sediments and water are determined. The concentrations of heavy metals observed is compared with standard Sediment Quality Guidelines (SQG) and it is found that the sediments are ‘Heavily polluted’ by Cr, Ni and Pb; ‘Moderately polluted’ by Cu and Zn and ‘Non polluted’ by As. For delineating the natural concentrations of heavy metals from those of anthropogenic activities, the concentration of metals determined should be compared with an unpolluted reference material (normaliser). A simple statistical method (correlation analysis in two steps) is devised in the present study for identifying the appropriate normaliser for this lake system. It is found that Silicon (Si) is the most suitable normaliser, which is a major outcome of this study and its potential could be explored for similar investigations. Heavy metal flux into the lake is estimated using the rate of sedimentation observed by using sediment traps. Risk assessment studies are limited in number. Models adapted from the US Environmental Protection Agency (US EPA) are used to assess the potential of toxic heavy metals on human health. It was found that Ni and Cd are at alarmingly high levels in the lake water while Ni is undesirably high in the sediments. Low cost technologies like phytoremediation and biosorption are studied to understand their effectiveness in the removal of heavy metals from aqueous solutions. It is found that water hyacinth, (a weed abundant in the lake) and coir pith are good remediating agents. It is hoped that data acquired in this study will be instrumental while initiating and charting out suitable strategies and guidelines for environmental management of the lake.

Keywords: Heavy metal, Akkulam Veli lake, Sediment Quality Guidelines, Normaliser, Sedimentation, Risk assessment, Phytoremediation, water hyacinth, coir pith

Major publications appeared in: Environmental Monitoring and assessment

Total no. of pages in the thesis: 284

Total no. of reference cited in the thesis: 267

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Title: “An Investigation on the Use of Timber in Temples of Central Travancore in Kerala”	
Researcher: Sheeja .K .P	Guide: Dr.V. SyamPrakash
Subject: Architecture	Co-Guide: Dr. M. Velayudhan Nair
<p>This research concentrates on the traditional construction techniques, wood crafts and preservation techniques used in timber temples of Kerala which is mainly concentrated in Central Travancore viz. Kottayam, Alappuzha and Pattanamthitta districts till 18th century. The timber temples of Central Travancore were studied and eight temples were studied by means of reconnaissance survey, out of which Ettumanoor Mahadeva temple, Sāttankulangarai Narasimhamoorthy temple and Kaviyoor Mahadeva temple were selected for detailed study based on its historical value, cultural value and extensive usage of timber. The documentation was also carried out and drawings in the form of plan, elevation and section were prepared and the measurements were compared with that given in “Tantrasamuccaya”. The height of the adhishtāna and wall does not agree with the canonical texts. The projection of the eaves was more than what was prescribed in these texts. Timber was used as structural, protective and decorative material in these temples. The traditional wood jointing techniques, material usage, carving techniques and the tools used were also studied. These temples have a history of more than 500 years and have survived the deleterious effects of climate of Central Travancore. The Climate index (decay hazard) and Equilibrium Moisture Content (EMC) of Alappuzha and Kottayam were evaluated for a period of 22 years and found that the values obtained for Alappuzha was higher than Kottayam and EMC was above 20% which show the vulnerability to fungal attack. But the case studies conducted revealed that no significant decay has occurred in these temples. From the wood samples tested from these temples proved that teak wood was used in construction of Srikovil which possessed hydrophobic properties due to the Caoutchouc content and are resistant to fungal growth. The use of only heart wood and heavy section has added to its durability. The tight jointing techniques and smooth cuts also made the material water tight. The centre vein of the leaf of the bread fruit tree was also used for fine polishing of wood. Gum or resin obtained from the fruit of pasakottaka (<i>Diospyros peregrine</i>) was used as glue and for caulking. The end grains of the rafters which are weak points of water ingress were also protected by rafter shoes. The ancillary structures like chuttambalam have under gone decay in the end grains of the rafters and the wood used was identified by testing in the laboratory as Aini and Jack. Fungal growth was seen on these ends which were identified as wet rot from the mycological study. Preservation of timber is needed for resisting the fungal decay. From the studies conducted it was identified that a traditional biological preservative which had tradition of more than 300 years which was made of a concoction of 30 different plant products was used in Central Travancore for preserving Kodimaram (<i>dwajastambha</i>) and proved effective. This preservative which has not yet been documented so far was prepared and tested for its efficacy on three species of timber viz. Teak, Jack and Aini and tested against white rot fungus in the laboratory. It was found that wood samples applied with the preservative were scarcely affected whereas the wood samples in control showed drastic weight loss. It is understood that our timber temples have to be preserved in natural and healthy way and the traditional knowledge acquired has to be applied in the mainstream practice.</p>	
<p>Keywords: Timber temples, Documentation, Wood sample testing, Climate index, Equilibrium Moisture Content, Biological preservatives</p>	
<p>Major Publication appeared in: Journal of Indian Institute of Architects Total no. of pages in the thesis: 22 Total No. of reference cited in the thesis: 56 Email of the Researcher: sheejakp@gmail.com</p>	

Stream: Social Science
Subject: *Commerce*

Title: “Total Quality Management for Local Government in Kerala”	
Researcher: Biju .S .K	Guide: Dr. Biju .T
Subject: Commerce	
<p>The local governance is intended to provide improved service delivery to citizens' door step, by realizing their needs. The vibrant local governance system in Kerala is the result of political will and bureaucratic commitment. Government of Kerala (GoK) initiated several steps to improve service delivery in Local Governance; Front Office Management (FOM) is the latest in this genre. The analysis of the office management system named FOM and documentation of Total Quality Management (TQM) initiative reveals the essence of TQM that brings all stakeholders together towards holistic approach of quality management which is the need of the time. The FOM highlighted the hard components and failed to follow the soft components of TQM. The outputs generated by this research will be a learnings and eye-opener for the stakeholders at all levels - policy to operational. By corroborating the learnings from this study and the Government efforts, it is ripe to think of new vistas of service delivery mechanism. The FDP (Focus, Delivery mechanism and Process) Model for TQM in Grama Panchayats (GPs), culminated by this study, is a response to this emerging need. The issues raised by this study can be mitigated through the implementation of FDP Model so as to ensure quality management system. This Model is moulded from the learnings of Cheruvannur-Nallalam (a GP in Kozhikode) vis-a-vis the TQM principles can be resorted in GPs for improving the quality of service delivery mechanism and its continuous improvement. This would also enable the GPs to avail ISO certification - a hall mark of Quality Management System. Hope the present research would be an impetus for a radical management regime in GPs, so as to ensure citizens' satisfaction.</p>	
Key words: Citizen Satisfaction, Local Governance, Quality Management.	
Outcome of Research:- The GoK, through Government Order No. 18/2015, LSGD, directed the Local Governments to attain ISO certification through the implementation of TQM for improving the service delivery in Panchayats.	
Major Publication appeared in: <i>Commerce Times (International)</i> , and <i>Commerce Spectrum (International)</i>	
Total No. of pages in the thesis: 230	
Total No. of references cited in the thesis: 217	
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Title: “E-Banking and E-Commerce – A Study on Linkages and Operational Support”	
Researcher: Nadia Sha	Guide: Dr. Gabriel Simon Thattil
Subject: Commerce	
<p>This research is intended to examine the extent to which the technology in banking i.e., E-Banking is utilized effectively by the customers and benefit the banking sector in formulating strategies to make maximum bank customers to use the e-banking facilities, also help the allied sectors like e-commerce. Analysis revealed an agreement between E-Banking and E-Commerce Model linkages in its operational level. The most important E-Commerce model transaction through E-Banking was done in C2C model. To make the Core Banking Services, ATM/Debit Card, NEFT/RTGS and Credit Card efficient the customers had to be made aware about the same. In the case of Internet Banking and Mobile Banking the customers had to be made aware and increase the usage rate of the services. The most benefited item due to the introduction E-Banking was its ‘Speed’ and ‘Accuracy’ on the transactions. The greatest success has happened to E-Trading due to the introduction of E-Banking services. The most important problem faced by the customers of different area in the e-services was the problem on telecom connectivity followed by the security problem. The main problem faced by the urban area bankers in all the type of banks and rural area public sector bank and private sector bank on the wide accessibility of E-Banking was that the customers were not fully aware of computer and internet operations. The New Generation Banks in rural area rated the main problem as the inadequate penetration of computer and internet. The most number of transactions is done for ‘Fund Transfer’ by Internet Banking and EFT, Mobile top-up with Mobile Banking and purchase of textiles with Debit or Credit card, bill payment was also widely done with the help of Internet Banking.</p> <p>Keywords: E-Banking, E-Commerce, Core Banking Services, ATM/Debit Card, NEFT/RTGS, Credit Card, E-Trading, E-Shopping</p>	
Major publication appeared in: Management Researcher, Southern Economist	
Total no. of pages in the thesis: 356	
Total no. of references cited in the thesis: 156	
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Title: “PRICE DISCOVERY AND MARKET EFFICIENCY OF COMMODITY FUTURES.”

Researcher: Samna .M

Guide: Dr. M. Shahul Hameedu

Subject: Commerce

The origin of commodity derivatives can be traced back to the need of farmers to protect themselves against fluctuations in the price of their crop. Liberalization of markets has resulted in market-based instruments for commodity risk management, like commodity futures. Commodity futures trading, especially in agriculture commodities have greater importance today. Several apprehensions are also being raised about this market, its requirement, efficiency and probable adverse effects. It has been forcefully argued that the futures markets are dominated by speculative interests, that farmers are not direct participants, and future trading leads to high price volatility. As a consequence, several delisting of important agriculture commodities from the derivatives market has been witnessed in India. The current study attempts to find out the farmers awareness in commodity future market, reasons for non- participation in this market and the factors which hinders them from hedging their risk through future market. Also try to find out the price discovery function of commodity future market. So the present study, focus on the commercial crops of Kerala such as Rubber, Pepper, and Cardamom and the opinion of the farmers. Spot and future prices of selected commodities were the secondary data. Secondary data collected was subject to appropriate time series and Econometric Analysis, using E-views, to draw suitable conclusions. Augmented Dicky Fuller Test, Philip Perron Test, Johansens’ Co integration test , Vector Error Correction Model (VECM) and Pair-wise Granger Causality Test were used to analyses the Price Discovery and market efficiency of commodity future market. This study concludes that price discovery occurred at future market and it is transferred to spot market and Indian commodity future market can perform the price discovery function. There is co-integration between future and spot prices of commodities traded in future market. Major factors which hinder farmers from hedging in future market are high risk, difficulty in physical delivery, need of margin money, difficulty in accessibility of information, and difficulty in attaining contract size. Though commodity futures market is introduced for the benefit of the farmers, they are not participating for getting that benefit. Farmers are not aware about the hedging facility of commodity future market.

Keywords: Commodity futures, Commodity Derivatives, Price Discovery, Hedging, Spot Price, Future Price.

Major publication appeared in: Yojana, Southern Economist, and Management Researcher.

Total no. of pages in the thesis: 357

Total No of reference cited in the thesis: 128

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Title: “A Study on the Working of Agricultural Commodity Markets in Kerala”	
Researcher: Sheena Sasidharan .V	Guide: Dr. B. Vijayachandran Pillai
Subject: Commerce	
<p>In recent years the significance of agricultural activities has been declined considerably on account of various reasons. The Government of Kerala has set up ACWMs(Agricultural Commodity Wholesale Markets) that which provides direct platform facilities to farmers without the interference of intermediaries with a view to overcome the marketing issues of the farmers in the state. The present study concentrates on the working and performance of the six Agricultural Commodity Wholesale Markets functioning in the State of Kerala from the perspective of its direct beneficiaries namely the business units and farmers. The research attempts to conduct market-wise and region-wise analysis of performance of the beneficiary units and farmers. The work also assesses the satisfaction levels of the units from various services and facilities provided by the ACWMs. The assessment of the satisfaction of the beneficiary farmers towards various services and facilities of the ACWMs also come under the purview of the present work. The research identifies the problems faced by the beneficiaries of ACWMs namely the business units. The study could reveal the following facts that, at present ACWMs in the State do not provide majority of the general facilities and services as per bye-law to the beneficiary units and farmers. Based on performance, the wholesale markets differ significantly in respect of quantity and value of produce handled. A Zig-Zag position is seen based on the financial performance of the wholesale markets. As regards to performance of beneficiary units significant difference is noted only in respect of average monthly sales obtained by the units. Whereas, based on the satisfaction level, urban units are found more satisfied in respect of various aspects when compared to rural units. Moreover, there exists significant correlation in ranking the problems experienced by the beneficiary business units. Based on the overall performance of farmers, rural farmers perform better compared to urban farmers. The study could also reveal that farmers can avail more prices by selling their agriculture produce in the wholesale markets rather than selling the same in the local markets. With respect to problems, farmers in ACWMs found to have experienced a lot of problems, but the nature of gravity of the problems differs.</p> <p>Keywords: Direct Platform, Intermediaries, Auction, Beneficiary Business Units, Farmers etc.</p>	
Major Publication appeared in : International Journal of Business And Administration Research Review	
Total No of Pages in the Thesis: 306	
Total No. of reference cited in the Thesis: 394	
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Stream: Social Science

Subject: *Economics*

Title- “Employment Pattern in the Electronic Media Sector: A Case Study of Kerala”

Researcher: Abin T. Mathews

Guide: Dr. M. K. Saralamma

Subject: Economics

The study examines the employment pattern of electronic media sector in Kerala. It is based on both primary and secondary data. The main source of the secondary data is National Sample Survey Organization’s 68th round survey on Employment and Unemployment in India. Primary data is collected from 167 employees of the electronic media sector through a structured schedule. It is supplemented by data collected from informal talk with persons associated with media. The study reveals that most of the electronic media sector workers are in urban areas.. Electronic media sector jobs are highly concentrated in southern states. The marginalized sections of scheduled tribes and scheduled castes are not adequately represented in electronic media sector. Large number of workers in private electronic media sector of Kerala is skilled technicians and professionals while that of in the public sector, a fair proportion are administrators and managers. The presence of large number of administrators and managers raises concerns on efficiency and dynamism. Majority of electronic media sector workers in Kerala are in private sector. Besides, the viewers of television channels have a perception that majority are female workers but this is not so in reality. There are large numbers of male workers behind the screen, who form majority. Job satisfaction of majority of workers in electronic media sector is at medium level. However another significant portion remains at low level of satisfaction. There seems to be a good working environment in electronic media sector. But there is need for further improvements in public sector. In maintaining a proper balance between work life and social life, social security benefits play an important role. However those in private sector are not adequately covered.

Key words- Electronic Media, Employment, Television, labour economics

Publication Appeared in – ISDA Journal

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Total Number of references cited in the thesis: 229

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Title : “FISCAL DECENTRALISATION AND URBAN SERVICE DELIVERY INKERALA: A CASE STUDY OF THIRUVANANTHAPURAM MUNICIPALCORPORATION”	
Researcher: Anilkumar .C	Guide : Dr. Baiju .K .C
Subject: Economics	
<p>The fundamental problem faced by ULBs in India is its vertical imbalance between functions and financial resources. This constitutionally inbuilt mismatch between the <i>functions</i> and <i>finances</i> is widen through the inefficient application of existing fiscal powers. A detailed study on the extent of fiscal decentralization, resource base and its utilization and thereby its effectiveness on Urban service delivery becomes significant in the premise of larger efforts towards fiscal decentralization and high incidence of urbanization in Kerala. The specific objectives of the study are, (1)To examine the extent of fiscal decentralization of the Urban Local Bodies (ULB) in Kerala, (2)To identify the resource base of Urban Local Bodies and its utilization for service delivery in the study area., (3)To assess the effectiveness of public service delivery in Urban Local Bodies. The combined value of fiscal autonomy and fiscal importance gives its <i>fiscal decentralization index</i> as 0.32 and TMC shows a case of relative ‘<i>fiscal centralization</i>’ rather than ‘<i>fiscal decentralization</i>’ which have larger implications on the stated objectives of decentralization and urban service delivery. It is quiet revealing that the TMC exhibits a fiscal paradox namely <i>Fiscal surplus</i> on the one hand and <i>poor performance rating</i> in service delivery on the other explaining a built in limitation in the rollout of Fiscal Decentralization. To assess the effectiveness of public service delivery, the study selected five civic services such as water supply, waste management, sewerage and drainage services, road development and maintenance of street lights. The urban governance and service delivery in TMC area are assigned to multiple agencies resulting in the overlapping of functions and lack of convergence at cutting edge level making a strong bearing on its effectiveness. From the above findings, it can be concluded that the computed value of fiscal decentralization index in TMC shows the existence of relative fiscal centralization. The corresponding analysis of resource base and its utilization in TMC shows poor performance on revenue and expenditure side. The supply side stakeholders too endorse the poor performance in service delivery as raised by demand side stakeholders where they found more reasons on relative fiscal centralization.</p>	
Total number of pages in the thesis. : 210 Number of references cited in the thesis: 89 Email of the researches: anilattungal@gmail.com	

Title: “TARGETED PUBLIC DISTRIBUTION SYSTEM IN KERALA”	
Researcher: Dr. Jayan .T	Guide: Dr. P. Kumari Latha Devi
Subject: Economics	
<p>Union Government introduced targeted public distribution system in 1997 following the failure of universal public distribution to serve the below poverty line and poorest of the poor households. A sizeable quantity of food grains, sugar and kerosene are being distributed at highly subsidized prices to the Antyodaya and BPL ration card holders. The present study enquires the extent to which the ration subsidy reached the poor and poorest of the poor and how many households moved out of official poverty line expenditure due to ration income. Food grain prices recently rose at unprecedented levels and the study seeks whether huge distribution of food grains through public distribution can stabilize the market prices. Around 10 percent of rural households moved out of official poverty line due to income transfer from public distribution system in 2004-05. And the corresponding figure among the urban poor households was around 12 percent .Around 43 percent of rural poor and 42 percent of urban poor in the state moved out of the poverty line expenditure of rupees 775.30 and rupees 830.70 respectively in 2009-10.The analysis of NSSO data on public distribution system in 2004-05 and 2009-10 proves that the PDS subsidy is not well targeted to the poor and vulnerable sections of the society. The major share of PDS subsidy reached the above poverty line classes of expenditure in rural and urban areas. However the per capita distribution of income subsidy from PDS declined along with higher monthly consumption expenditure classes. More than half of the food grains meant for distribution to AAY-BPL households did not reach the beneficiaries belonging to fisher folk households. The distribution of rice from PDS in the state did not narrow down the difference between the open market prices of rice in the states of Kerala and Andhra Pradesh. Around 60 percent of the households in the fishing villages is issued above poverty line ration cards. Public Distribution contributed substantial income gain to fishing households and the fisher folk households met around one third of their food grain consumption from PDS.</p>	
Keywords: Public Distribution, Poverty, Food Security	
Major publication appeared in: Social Science in Perspective	
Total number of pages in the thesis: 165	
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Stream: Social Science

Subject: *Education*

Title: “DEVELOPMENT OF AN INSTRUCTIONAL PACKAGE FOR ENHANCING EMOTIONAL INTELLIGENCE IN SECONDARY SCHOOL STUDENTS”	
Researcher: Anil Kumar .V	Guide: Dr. Theresa Susan .A
Subject: Education	
<p>The study was an attempt to develop, validate and test the Instructional Package ‘EMINENCE’ for enhancing emotional intelligence in secondary school students. The instructional package was developed based on the ADDIE instructional design model. Five emotional intelligence domains and ten competencies are selected for the development of Emotional Intelligence Instructional Package. Normative survey and Quasi experimental method was the method adopted in this study. Print, electronic and face-to-face training are used for developmental process. The major findings of study are a lesser proportion of secondary school students possess high Emotional Intelligence scores, whereas others possess low Emotional Intelligence; majority of the teachers were of the opinion that the extent of inclusion of Emotional Intelligence components in text books of Class VIII to X for enhancing Emotional Intelligence is poor; suitability of the content incorporated in the text books of standard VIII, IX and X for developing the dimensions of Emotional Intelligence is not suitable and sufficient; the pointers of Emotional Intelligence like anxiety, anger, stress, examination anxiety and self centeredness of secondary school students are increasing and the remaining emotional and social skills viz., empathy, helping others, problem solving ability, communication, tolerance, self confidence, responsibility and patience are decreasing in the present day secondary school students; availability of instructional materials for enhancing emotional intelligence of secondary school students of Kerala is inadequate; the developed instructional package “EMINENCE” is effective for enhancing emotional intelligence in secondary school students.</p>	
Keywords: Emotional Intelligence, Instructional Package, EMINENCE	
Major Publication appeared in: GCTE Journal of Research and Extension in Education	
Total No of Pages in the thesis: 405	
Total No of reference cited in the thesis: 208	
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Title: “Triggering Creativity in Writing among High School Students in ELT Classrooms through Interactive Strategies of Teaching”

Researcher: Bindhu .T.S

Guide: Dr. M. S. Geetha

Subject: Education

English Language Teaching (ELT) is changing constantly due to research and innovations. For English Language teachers, it is very essential to have a wide range of active instructional strategies to promote and develop creativity in learners. The lack of emphasis on the major creative faculty leaves little room for the cultivation of views, opinions and ideas among learners. By making creative writing conditions more interactive, rather than being completely personal, learners’ power of creativity can be harnessed and rejuvenated. The present study attempts to find out the extent of use of interactive strategies of teaching by Secondary School teachers in English to trigger creativity in writing in ELT classrooms, study the perception of Secondary School teachers in English on the difficulties experienced by the high school students in creative writing in English, develop an Interactive Strategy Based Instructional Material (ISBIM) to trigger creativity in writing among high school students in ELT classrooms, find out the effectiveness of Interactive Strategy Based Instructional Material (ISBIM) in triggering creativity in writing among high school students in ELT classrooms, find out the effectiveness of Interactive Strategy Based Instructional Material (ISBIM) in triggering creativity in writing among high school students in ELT classrooms with respect to gender, locale and type of institutions. Normative Survey (Secondary School Teachers in English (N = 225)) was used for collecting data from Secondary School teachers regarding their use of interactive strategies in ELT classrooms and their perception on students’ difficulties in creative writing in English. For the Experimental Method(Standard IX high school students (N = 468)), Quasi-Experimental Design was employed for determining the effectiveness of Interactive Strategy Based Instructional Material (ISBIM) in triggering creativity in writing among high school students in ELT class rooms. The findings of the study are as follows:

- 10.67% of Secondary School teachers in English opined that the extent of using interactive strategies of teaching in triggering creativity in writing in ELT classrooms is high, while for 52% of them it is moderate and for the remaining 37.33%, it is low.
- As far as the perception of Secondary School teachers is concerned, for 72% of teachers the ‘difficulties experienced by high school students in creative writing in English’ is average, for 12.89% it is low and for 15.11% it is high.
- Interactive Strategy Based Instructional Material (ISBIM) is effective in triggering creativity in writing among the whole sample of high school students in ELT classrooms on the ground of $F_{y,x}$ ratio 4670.54 and is significant at 0.01 level.
- Interactive Strategy Based Instructional Material (ISBIM) is effective in triggering creativity in writing among high school students in ELT classrooms with respect to gender, on the ground of $F_{y,x}$ ratio 2132.11 for the male sample and 2450.78 for the female sample and are significant at 0.01 level.

Interactive Strategy Based Instructional Material (ISBIM) is effective in triggering creativity in writing among high school students in ELT classrooms with respect to locale, on the ground of $F_{y,x}$ ratio 2220.02 for the rural sample and 15570.74 for the urban sample and are significant at 0.01 level.

Interactive Strategy Based Instructional Material (ISBIM) is effective in triggering creativity in writing among high school students in ELT classrooms with respect to type of institutions, on the ground of $F_{y,x}$ ratio 2665.37 for the aided school sample and 2088.40 for the govt. school sample and are significant at 0.01 levels.

Keywords: Creativity, Creative writing, ELT Class rooms, Interactive Strategies of Teaching

Major publications appeared in: New Frontiers in Education, International Journal of Education and Research

Total No of Pages in the thesis: 268

Total No. of reference cited in the thesis: 60

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Title: “STUDY OF THE RELATIVE EFFECTIVENESS OF INDUCTIVE THINKING MODEL AND SYNECTICS MODEL OF TEACHING THE CONCEPTS OF REFRACTION AND DISPERSION AT HIGHER SECONDARY LEVEL”.

Researcher: Hemaletha Thilakom .S

Guide: Dr. T. V. Bindu

Subject: Education

The study was aimed at comparing the effectiveness of Inductive Thinking Model and Synectics Model of teaching on student’s achievement in Physics. The Investigator adopted experimental method. Lesson Transcripts based on Inductive Thinking Model, Synectics Model and Activity Based Approach on the topics Refraction and Dispersion at Higher Secondary Level, achievement Test in Physics for Higher Secondary school students on the topic Refraction and Dispersion, Group Test of Verbal Intelligence and The Kerala Socio-Economic Scale were the tools used. The findings of the present study indicate that among the three instructional strategies, viz., Inductive Thinking Model (ITM), Synectics Model (SM) and Activity Based Approach (ABA), Synectics Model is the most effective strategy in enhancing achievement in Physics at Higher Secondary level. Inductive Thinking Model is more effective when compared with Activity Based Approach. Synectics Model is more effective when compared with Activity Based Approach. Synectics Model is found to be more effective when compared with Inductive Thinking Model. Therefore, it is evident that Synectics Model can be introduced in education at all levels for the successful realization of instructional objectives in Physics. The study implies that teachers should employ innovative and novel instructional strategies, which provide multitude of opportunities to choose suitable activities for instruction. This is the hallmark of effective teaching. New strategies do not require sophisticated technological devices except competence and commitment on the part of the teachers. National level and State level curriculum framers must take adequate steps to incorporate innovative learning strategies that enhance deep learning among students. Professional teacher education institutions and organisations should incorporate and disseminate the outcomes relevant and significant research conducted in the field of education.

Total number of pages: 361

Total No of reference cited in the thesis: 221

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Title: “RELATION BETWEEN GARDNER’S MULTIPLE INTELLIGENCE VARIABLES AND ACHIEVEMENT IN VARIOUS SCHOOL SUBJECTS AT SECONDARY LEVEL IN KERALA”

Researcher: Pradeep Chandran .B

Guide: Dr. T.V. Bindu

Subject: Education

According to Howard Gardner (1999), all human beings possess all the different intelligences in varying degrees and individual manifests varying levels of these different intelligences and thus each person has a unique cognitive profile. Gardner further discussed that each person has at least eight Multiple Intelligences which include Verbal-Linguistic, Logical-Mathematical, Visual-Spatial, Musical, Bodily-Kinesthetic, Interpersonal, Intrapersonal, and Naturalistic intelligences. The present study is an attempt to identify the relationship between Gardner’s Multiple Intelligence variables and achievement in all the secondary school subjects. An awareness of multiple intelligence theory has stimulated teachers to find multiple ways for helping all students in their classes based on their individual strengths and weaknesses. Major Findings of the study proved that all the components of Multiple Intelligence and Multiple Intelligence (Total) have significant positive correlation with the achievement in English, Malayalam and Hindi. The study also proved that except Naturalistic, Musical and Bodily-Kinaesthetic Intelligence has significant positive correlation with the achievement in Science. It is seen that except Naturalistic and Bodily-Kinaesthetic Intelligence has significant positive correlation with the achievement in Social Science. It is also seen that except Naturalistic Intelligence has significant positive correlation with the achievement in Mathematics. The study revealed that Verbal-Linguistic Intelligence, Logical –Mathematical Intelligence and Visual-Spatial Intelligence are significant in predicting the achievement in Malayalam, English, Hindi, Social Science, Science and Mathematics. The Educational Implications of the study are - As Multiple Intelligence variables are positively correlated with achievement in various school subjects, the teachers can practice Multiple Intelligence based teaching -learning strategies in the classrooms to accommodate the various intelligences of their students for academic and future success in taking a profession of their interest.

Key Terms: Multiple Intelligence Variables , Achievement in Various School Subjects, Secondary Level

Major publication appeared in: Academia (A Peer Reviewed International Journal on Education, IASE Thrissur) ISSN: 2250-2696 Vol 4 (1)

Total No. of pages in the thesis: 197

Total no. of reference cited in the Thesis : 157

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Title: “Impact of Continuing Education Programmes on the Empowerment of Women in Kerala”	
Researcher: Soosamma .P. A	Guide: Dr. V. Reghu
Subject: Education	
<p>Continuing Education Programme is conceived as a major human resource development initiative with the active participation of the entire community. The present study is confined to the Continuing Education Programme (CEP) initiated by the National Literacy Mission (NLM) through State Literacy Mission Authority (SLMA) for illiterates, neo-literates, dropouts, push-outs and such other similar groups. The ultimate goal of continuing education is to have a significant impact on the learners, an impact that results in a measurable increase in the learners’ educational, personal, social and economic development. In this study, Continuing Education is taken as an extension of non-formal education for those who cannot continue their education because of socio-economic and other such factors. The aim of the study is to find out the impact of Continuing Education Programmes on the empowerment of women beneficiaries in Kerala. Comparison of the responses of women beneficiaries prior and after the Continuing Education Programme revealed that women are significantly empowered through Equivalency Programme, Income Generating Programme, Individual Interest Promotion Programme and Quality of Life Improvement Programme which might have brought radical change in their life. This change was observable in all components of the women empowerment such as educational, personal, economic, social and political. The present study upholds the beneficial effect of the Continuing Education Programmes in promoting women empowerment in society. Hence it is imperative that the CEP should continue ahead in its full strength and vigour.</p>	
Keywords: Empowerment, Continuing Education	
<p>Major Publication appeared in – Not yet published Total no of pages in the thesis : 312 Total number of reference cited in the thesis : 321 Email of researcher : soosamma@yahoo.com</p>	

Title: “Effectiveness of Technology Integrated Instruction in improving the Study Skills of High School Students in English in Kerala”

Researcher: Sreejalakshmi .S

Guide: Dr. M. S. Geetha

Subject: Education

For the achievement of excellence in schools, researches have to be undertaken in the field of education which aim at helping the students "maximise the utilisation of the available resources" and "minimise their stress". Acquiring mastery over study skills is one among the many ways of minimising the stress. By utilising the available resources, teaching strategies create opportunities for skill development. It is in this context that the teaching strategy, using computer technology resources among students, has its relevance. Hence, through this study, the investigator created an opportunity for the high school students to improve their study skills through technology integrated instruction. For this, a Technology Integrated Instructional Package on Study Skills was developed. Survey and Experimental methods were adopted for the study. Questionnaires were administered on teachers and students in high schools. The Technology Integrated Instructional Package on Study Skills was used for the experimental study. The data collected from the pre test and post test were analysed using appropriate statistical techniques like the Paired Samples t test and Multivariate Analysis of Covariance and interpreted accordingly. A significant multivariate effect of Technology Integrated Instruction was found across the total sample for the combined dependent variables V1 to V10- Referring to a dictionary, Skimming, Scanning, Surveying a book, Note making, Note taking, Information transfer, Summarising, Letter writing and Report writing. There was a significant main effect of Technology Integrated Instruction on all the dependent variables V1 to V10. The findings of the study have wide implications for the improvement in the programmes adopted for teaching languages in the high schools of Kerala. Results of the current study prove that technology integrated instruction is beneficial in improving the study skills of high school students.

Keywords: Technology Integrated Instruction, Study Skills

Major Publication appeared in: GCTE Journal of Research and Extension in Education

Total No. of pages in the thesis: 473

Total No. of reference cited in the thesis: 284

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Title: “RECIPROCATION OF TEACHER EDUCATORS TOWARDS THE INPUT OF NCTE AT THE SECONDARY LEVEL IN THE UNIVERSITY OF KERALA.”

Researcher: Suma .K .O

Guide: Dr. V. Reghu

Subject: Education

This research is a detailed study of the opinion of teacher educators in the university of Kerala towards the norms and standards put forward by NCTE for the functioning of colleges of teacher education. NCTE is an agency approved by parliament to assure quality and standards in the field of teacher education. Comparison of the opinion of teacher educators in government, aided, unaided and university centers of teacher education helped to get a clear picture of curriculum transaction facilities, infrastructural facilities and utilization of funds. The opinion of student-teachers supported the comparison of norms and standards. Multi/mixed methodology is used in this study for the analysis of the data. Different statistical techniques were employed in this study for strengthening the data collected. The findings of the study reveals that a minimum intake of students is followed in all teacher education institutions. Though laboratory facilities are maintained in these institutions classes are not provided for the students. Experts are of the opinion that admissions have to be done on the basis of aptitude test and achievement test. To reduce the number of institutions is the important suggestion by the experts. They also pointed out that NCTE norms are not fully applicable in the Kerala education scenario. The conclusions derived from the analysis of the opinion are that teachers and students are aware about the norms of NCTE. The present study also reports the existing conditions of teacher education institutions in the university of Kerala.

Key words: NCTE, Reciprocation, Teacher education, University of Kerala.

Total no. of pages in the Thesis: 345

Total no. of references cited in the Thesis: 232

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Title: **“The Effect of Self concept, Mathematical Creativity ,study Habit, Level of Aspiration and Parental Involvement on Achievement in Mathematics of Secondary School Pupils”.**

Researcher : Vijayalekshmi .S

Guide : Dr. P. Viswanadhan Nair

Subject: Education

The major purpose of the school is to help prepare children to meet adequately the problems of life, and find their place in the expanding culture. In recent years increasing attention has been given to analyses of society to determine the knowledge, habits, attitudes and skills that are important and likely to be needed by the learner in the society. Mathematics is the fundamental subject which inculcates scientific curiosity, scientific spirit, scientific skill and scientific attitude of mind, without mathematical knowledge and skill there can be no knowledge of sciences and thus no scientific and technical advancement. Mathematics is a part of Children's life experience which they talk about, children pose and solve meaningful problems, children are abstractions to perceive relationship and structure and children understand the bases structure of Mathematics. The present study is an attempt at identifying the influence of certain affective variables, level of aspiration and mathematical creativity on achievement in Mathematics of Secondary School of Pupils. **Variables of the Study:** The independent variables of the present study are (i) Self-concept (ii) Mathematical creativity (iii) Study Habit (iv) Level of Aspiration and Parental Involvement. The dependent variable of the present study is Achievement Mathematics measured based on Bloom's Taxonomy. **Methodology:** Normative survey method was employed **Sample:** 900 secondary school pupils selected using proportionate stratified sampling technique. **Statistical techniques used:** correlation analysis, t-test, analysis of variance and stepwise multiple regression were used for analyzing the data collected. **Major findings:** 1. Self-concept, study habit, Mathematical Creativity, Parental involvement and level of aspiration are found to discriminate between high, average and low achievers in Mathematics. 2. Mathematical Creativity and Level of Aspiration discriminate between boys and girls. 3. Self-concept, mathematical Creativity, Level of Aspiration and Parental involvement discriminate between rural and urban pupils. 4. Significant correlation between each of the independent variables with achievement in Mathematics was observed. The educational implications of the findings of study were discussed and suggestions for further study was formulated.

Keywords: Self concept, Mathematical Creativity, study Habit, Level of Aspiration and Parental Involvement.

Total no. of pages in the thesis: 211

Total no of reference cited in the thesis: 315

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Stream: Social Science

Subject: *History*

Title: “The making of the public life of Travancore : The role and contributions of Sarasakavi Mooloor S. Padmanabha Paniker”

Researcher : Anu .R

Guide : Prof. P. J. Cherian

Subject : History

Public spaces and public life are essential pre-conditions for a healthy democratic society. The life and contributions of Mooloor S. Padmanabha Paniker (hereafter Mooloor) is examined in the backdrop of a caste-ridden society experiencing the emergence of public spaces. His lived experience and his role as an organic intellectual in the larger context of the society are examined in this Ph.D thesis. Though there are studies on his literary contributions, his contributions in varied fields have not been comprehensively evaluated. So this study is relevant. Following are my findings. Public life is possible only through a societal consensus that all are free to participate in discussions to identify their social problems as well as to influence political opinion. The land ownership pattern, the caste hierarchy, the traditional educational systems and the tradition bound monarchical state were creating hurdles in the way of the formation of public life in Travancore. A climate conducive to the formation of public life was created by modern education, changes in the land ownership system, emergence of industry and a new middle class, the attitudinal change on the part of the monarchy, the social reform movements, caste organizations, the press, art, literature etc. Through his literary works, campaigns, through the press and activities in the field of art Mooloor disseminated ideas favourable to the creation of public life. Through the founding of public spaces Mooloor could help to create pathways for the coming together of people. By means of his campaigns, through community and cultural organizations, through his speeches and public debates Mooloor promoted logical and rational thinking in Travancore. He managed to bring the ideas that evolved from his public debates to the notice of the authorities. The critical thinking he generated, the intellectual vibrancy he expressed, the humane and rational approaches to solve the social problems and devotion to collective action where the social seeds that he sowed to strengthen the new public life traditions in Travancore in the first quarter of the 20th century.

Keywords: Public life, public space, public institutions, public debates, caste hierarchy.

Major publications appeared in : *Journal of Kerala Studies*.

Total number of pages in the thesis: 364

Total number of references cited in the thesis: 1200

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Title : “A History of National Service Scheme in Kerala.”	
Researcher : Dr. Alassan Kutty .P	Guide : Dr. T. Jamal Mohammed
Subject : History	
<p>The thesis is a theoretical and field oriented study of the historical evolution of National Service Scheme (NSS) with special reference to Kerala. It considers the NSS as an extension dimension of higher education, which analysis the Scheme as an opportunity to involve the students in voluntary service activities by upholding its objectives, “ Personality Development of students through Community Service”. It evaluates the overall activities student volunteers. The motto of NSS ‘<u>Not Me But You</u>’, promotes the spirit of voluntary service in young minds. The cultural roots of the concept of volunteerism in and outside the country are traced to substantiate its social significance. The link between the constructive programme of Gandhism and Philosophy of NSS is established. The economic viability of continuing NSS is justified. Quality enhancement and youth empowerment, in higher education are the two value addition of NSS. Major finding of the study included</p> <ol style="list-style-type: none"> 1. NSS is a change agent of students in their capacity building process. 2. The instant benefit for the society is only byproduct. 3. NSS creates social and material assets 4. NSS is a contributor for the Millennium Development Goals of the UNO 5. The NSS camps facilitates for the improvement of language skills 6. The level of self confidence of NSS volunteers are higher than other students. 7. Community life is experimented through NSS special camps. 8. The NSS acts as a bridge to link the campus with the community for socially useful productive programmes. 9. NSS upholds dignity of labour . 10. The need for updating NSS activities by addressing the current challenges are specifically pinpointed. <p>Keyword: Personality Development, voluntary action and development campus and community relation leadership quality and youth empowerment.</p>	
Major Publication appeared in : NSS Newsletter	
Total number of pages in the thesis: 351	
Total number of reference cited in the thesis: 165	
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Title: “M.R. Bhattathiripad and the Social Transformation of the Nambudiries of Kerala”	
Researcher: Harikumr .S	Guide: Dr. T. K. Vijayamohan
Subject: History	
<p>Kerala is a land of many races, communities as well as religious groups. The Malayali Brahmins (the Nambudiries), are believed to have come from North India in very ancient times, probably during the early centuries of the Christian era, and they follow to this day many of the ancient Aryan customs. Hence, a study of the social transformation of the Nambudiri Brahmins is bound to be of great interest to the academic society. Kerala society had undergone drastic changes in the beginning of the twentieth century, which posed serious challenges to the conservative and age-old practices followed by all communities from the apex to the lowest. At the apex of the Kerala society, the Nambudiries were bounded by age old customs and manners. Naturally, the younger generation of the community questioned it. M.R. Bhattathiripad was one of the pioneering reformers of the community who used his pen as a great weapon against the evils and he did what he had written. Thus, the study is focused on M.R. Bhattathiripad and his activities in the <i>Yogakshema Maha Sabha</i>, his efforts to make the community into modernity, his works for the uplift of the Nambudiri women, his literary contributions etc. and is critically analyzing the entire social transformation of the Nambudiri community in general and the role played by M.R. Bhattathiripad to accomplish the goal in particular.</p>	
Major publication appeared in: <i>Journal of Kerala Studies</i>	
Total No of pages in the Thesis: 300	
Total No. of reference cited in the Thesis: 332	
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Title: “SEAFARING AND MERCANTILE ACTIVITIES IN MEDIEVAL MALABAR, 800-1498”

Researcher: Martiz Kurian

Guide: Dr. V. Sathish

Subject: History

The doctoral thesis, entitled “Seafaring and Mercantile Activities in Medieval Malabar, 800-1498” attempts to undertake a comprehensive study on the maritime and commercial activities in Kerala during the stipulated medieval period. The long-distance maritime trade of Malabar had suffered a setback due to the decline of Mediterranean contacts, especially in the early centuries of the Christian era. However, the migration of West Asian merchant groups and expansion of agriculture during the early medieval epoch paved the way for the revival of maritime trade. Deviating from previous studies, this work aims at the reconstruction of maritime economic history of Malabar by focusing on maritime trade routes, seafaring merchant groups and intra-Asian trade links with Malabar in the medieval period. The study examines geographical conditions, royal trade charters, changing patterns of trade, shifting port-hierarchies, rise of maritime kingdoms and commercial activities of merchant organizations in the given period. It also envisages the analysis of mercantile activities in Malabar against the background of diverse socio-economic and political developments which had taken place in intra-Asian and Indian Ocean regions during the period between ninth and fifteenth centuries. The study is based on the inscriptions, indigenous medieval literary works and travelogues. Apart from these, coins and ballads are used as primary source of information. The major problems including the absence of indigenous *vaisyas*, lack of powerful agricultural class, space of Semitic merchant groups and growth of a culturally symbiotic society in medieval Malabar are discussed. The chief characteristics of Indian feudalism as manifested in the stagnation in commerce, the decline of long distance trade and the widespread decay of urban centres in medieval India are effectively negated in the case of medieval Malabar.

Keywords: Intra-Asian trade, Malabar, Maritime trade Markets, Mercantile activities, Merchant groups, Port cities, Seafaring, Trade routes

Major publications appeared in: *Journal of Indian History*, *Journal of Kerala Studies* *History Today*

Total no. of pages in the thesis: 321

Total no. reference cited in the thesis: 965

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Title : “The Progress of Cochin under the Diwanship of Sankarawarrier”	
Researcher: Preetha Raj .D	Guide: Dr. T. P. Sankarankutty Nair
Subject: History	
<p>In the post John Munro period native Cochin produced only two great Diwans ,Diwan Sankarawarrier (1840-1856)and his son Diwan Thottakat Sankunni Menon(1860-1879).Sankunni Menon maintained a diary more or less regularly for thirty four years.Diwan Sankarawarrier established a sound system of administration . His ascendancy was welcomed by all sections of the society because his predecessors Like `Seshagiri Rao (1825-1830) Edamana Sankara Menon (1830-1835) Venkatasubbayya (1835-1840) were neither able nor benevolent administrators. Of this Sankara Menon was so corrupt and inefficient that a deputation consisting of representatives of the Brahmin,Nair and Christian communities represented to the Governor of Madras a series of corruption charges .It was under such a chaotic conditions that Sankarawarrier stepped into the Diwanship of Cochin . Within a short span, the new Diwan set things in the right direction with a view to rectify the mistakes committed by the past administrators. Sankarawarrier was fortunate to have with him a good team of subordinates. Major General William Cullen was as distinguished as a Scientific observer as he was a soldier and administrator He served as Resident in Travancore and Cochin (1840-1860) for over two decades and during Cullen’s Residency,he gave all the advice ,encouragement and support to one whom he described as the most excellent Diwan of Cochin by far the most independent ,upright,zealous and successful minister that the Cochin Government have ever possessed.</p>	
Keywords-Kanam land,karanmai, karalar, Karozhivu,kuti, muppara,poduval, Uralar, Ur	
Major Publications appeared in-Articles published in South Indian History Congress	
Total No. of pages in the thesis: 310	
Total no. of reference cited in the thesis: 140	
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Title: “Retrospect and Prospect of Sustainable Agriculture in Kerala (1956-2011)”

Researcher: Santhi Jose

Guide: Dr. S. Sivadasan

Subject: History

The alarming fall in the production of food crops against the cash crops, indebtedness of the farmers, environmental degradation - all made agriculture in Kerala during the period under study unsustainable and most vulnerable. At present Kerala agriculture is in a state of chronic crisis that demands the urgency for sustainable agricultural practices. The increasing concerns over agriculture's impacts on the environmental, economic and social systems are being addressed in this thesis. This study also investigates the potential of sustainable agriculture in balancing social responsibility, economic viability and ecological security in the Kerala scenario. The present research work assumes relevance as it encourages making an evaluation of the drawbacks of the present agrarian situation in Kerala and points out the strength as well as the urgent need for agricultural sustainability for today and tomorrow. The study also invites further attention of agricultural scientists, farmers, authorities, academics and all others in the society to realize the importance and need of sustainable agriculture and for that to take up further research.

Keywords: Sustainable Agriculture, Social Responsibility, Economic Viability, Ecological Security

Major Publications Appeared in: *Review of Social Sciences*

Total no. of pages in the thesis: 276

Total no. of reference cited in the thesis: 243

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Stream: Social Science

Subject: *Home Science*

Title: “Role and Status of elderly in the family”	
Researcher: Sandhya Suresh	Guide: Dr. S. Kamini
Subject: Home Science	
<p>In the Indian Society, the cultural values and the traditional practices emphasize that the elderly members of the family be treated with honour and respect. People with 60 years of age and above are considered as an ‘elderly’ segment of the population. The families of the elderly are expected to ensure the needed care and support. However, recent changes in the size and structure of families have caused the re-arrangement of the roles, functions and status of the elderly. This demographic shift has immensely affected the social fabric, cultural values and economic structure of the society to a great extent. With the rapidly increasing number of aged, compounded by disintegration of joint families and ever increasing influence of modernization and new life styles, the role and status of the elderly have emerged as an important issue. Therefore an attempt has been made to elicit the role and status of elderly in the family. The findings of the present study revealed that the respondents were able to perform their roles as they perceived. Male respondents perceived the roles like financial matters, purchasing and care of pets more important than females and the same were performed by them. Agricultural activities, care of grandchildren, laundry work, cleaning and kitchen work showed that they were perceived more important by females than males and they performed it also. In the case of activities like care of livestock and cleaning, it was noticed that, rural respondents perceived the above roles to be important than the urban respondents. Respondents who had the headship of the family had better perception regarding various roles to be carried out. Marital status of the respondents also influenced the role performance and those who were currently married exhibited better role performance than widows/widowers. Those who performed their roles were found to have better utilization of their leisure time and also experienced lesser problems. Marital status of the respondents was found to influence their status and the widow/widower had lesser status when compared to the currently married respondents. As the educational level of the respondents increased, the level of status enjoyed by them also was found to increase. Ownership of the house and economic independency accorded an elevated status to the respondents. Those had the headship of the family were also found to have better status. Respondents who had their children living with them had better status when compared to those respondents who were living with their children. The respondents who actively performed various roles in the family were found to have better status. Respondents with higher educational qualification, who had the headship of the family and ownership of the house were found to experience lesser problems. It was observed that availability of income had a direct effect on the problems experienced by the respondents and the least affected respondents were those who had sufficient income at their disposal. Female respondents experienced economic, psychological, social and recreational problems more than their counterparts. Respondents from rural areas experienced more of psychological and recreational problems when compared to their urban counterparts. Ageing is a serious reality and it is the last step of life cycle. As India marches into the next millennium, ageing will be one of the crucial issues vying for attention. The elderly should be considered not as a burden to the society but as an asset and their valuable experience should be utilized fruitfully and it should be the responsibility of the society and the government to impart an improved and effective quality of life to them in return to their lifelong dedicated service towards their children and society.</p>	
Keywords: Elderly, role performance, role perception, status.	
Total no: of pages in the thesis: 308	
Total no: of reference cited in the thesis: 109	
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Stream: Social Science

Subject: *Law*

Title: “CREAMY LAYER PRINCIPLE : AN ANALYTICAL STUDY.”	
Researcher: Prabhu .M .A	Guide: Dr. K. C. Sunny
Subject: Law	
<p>The Constitution envisages a casteless society where all citizens are entitled to equality before law and equal protection of the law. Art 16(4) lays down that the state may reserve any post or appointment in favour of any backward class of citizens who in the opinion of the state are not adequately represented in the services under that state. The Hon’ble Supreme Court in its judgment (Indra Sawhney case) clarified that backward class of citizens in Art 16(4) can be identified on the basis of caste and not only on economic basis and that creamy layer must be excluded from backward classes. The order for excluding creamy layer is an innovative attempt by the Hon’ble SC to do justice to the backward classes and to ensure that the benefits extended to the backward classes are not snatched away by the opulent and influential section of backward classes. The provision for exclusion of creamy layer and the attempt to whittle it down offers scope for a detailed legal analysis. Present study is such an attempt. As part of study the background in which the creamy layer order was issued by the Supreme Court and the several measures taken by interested parties to restore reservation benefit to creamy layer has been analyzed in depth. The legislative attempts to neutralize the creamy layer order and the plethora of cases on subject are examined in depth. In addition an empirical study is conducted to examine rationality of the creamy layer principles and the measures adopted for implementing it.</p>	
Total No. of pages in the Thesis : 251	
Total No. of reference cited : 58	
E mail of Researcher: prabhukuzhithattil@gmail.com	

Title: “ GENE THERAPY: LEGAL DIMENSIONS ”	
Researcher: Sini .T .N	Guide: Dr. Bismi Gopalakrishnan
Subject: Law	
<p>Gene therapy is a rapidly growing medical technology which helps to root out genetic diseases for which no other therapeutic options are available so far. This therapeutic technique is now used to treat acquired diseases like AIDS, cardiovascular diseases, neurotic diseases and a large number of cancers. The result is the commercialization of therapeutic products with huge amount which is normally unaffordable to the common mass. The germ line gene therapy and its extension eugenic gene therapy have the potential to affect the future generations also. Hence the ethical issues arises from gene therapy leads to the violation of fundamental human rights such as Right to Life, Right to Equality, Right to Privacy, Right to Confidentiality, Right to Health etc. The legal issues thus arises are pertinent to gene therapy like who will do the final risk-benefit analysis of gene therapy, property rights on gene therapy products, the liability of defective products etc. In the international level there are no documents which effectively tackle the implications of gene therapy. And across the world no <i>sui generis</i> legislation is present which successfully address the needs and aspirations of this emerging and path breaking medical technology. The research and development of gene therapy is a need of the hour of India when considering the alarming rate of cancer in our country. The legislative vacuum in this field is a hindrance to its advancement. Thus the present study concentrates on framing a <i>sui generis</i> legislation for gene therapy by taking into account its human rights and legal implications.</p>	
<p>Major publication appeared in: Kerala University Journal of Legal Studies Total no. of pages in the thesis: 404 Total no. of references cited: 800 Email of researcher: sininewdale@gmail.com</p>	

Stream: Social Science
Subject: *Learning Disability*

TITLE: “ EFFECTS OF CERTAIN LEARNING STRATEGIES AND TECHNIQUES FOR REMEDIATING ACADEMIC SKILL DEFICIT IN LEARNING DISABLED CHILDREN”

Researcher: Smitha .S

Guide: Dr. Rita Krishnan

Subject: Learning Disability

Learning disabilities and their remedial services are very important and relevant issues in India, Since last few years, awareness about the issues are widely discussed across schools in Kerala. Except a few provisions during exams, neither the Ministry of Education nor the school authorities have been making any attempt to integrate or meet the needs of disabled ones into regular school system. Like other developed countries we too have to practice and ritually implement, The Individual with Disability Act (I.D.E. A) i.e educating special need child in the least restrictive environment for the benefit of our children. The purpose of my study was to determine the effect of learning strategies and thereby develop a model to provide adequate screening system and remedial support for students with Learning Disabilities, which can be easily followed by schools. The total population of the study was 204 students of grade 4 & 5. Among that 72 students were identified as Learning disabled which was equally distributed to control and experimental group. The parametric tests to treat the data were “Analysis of variance”, “Chi-square test” and “Wilcoxon”. The most significant findings of the study were that, the study observed a significant association between the variable Learning disability and other factors like sex, family history, birth order, parent education, consanguinity, and supportive parents. We also observed a significant difference in the reading, writing, Spelling and comprehension skills of learning disabled children before and after the intervention program. Finally the study also revealed that there is a significant difference in the reading, writing, spelling and comprehension skill of auditory, visual and applied learners after using the learning strategies. The educators, parents and school administrators must develop a workable relationship to ensure that LD students be given adequate support to meet their academic needs and social adjustment necessary for life advancement. This can be achieved only through sincere efforts from the Government and school authorities. LD students can overcome their disabilities and become a purposeful member in their classroom.

Key words: Learning disability, reading comprehension, learning strategies, special education

Major Publication appeared in: Dev, S. (Author) Relationship between Teachers Perception and Academic Achievement of Learning Disabled Students. Appeared in Journal, DAR/JER/XV1-/2013-2014(Vol.XV1 Nos.1&2).

Total No. of pages in the thesis: 307

Total No. of reference cited in the thesis: 289

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Stream: Social Science

Subject: *Library & Information Science*

Title: “An Investigation into Information Needs and Information Behaviour of Tourists and Design of a Tourist Information System for Kerala”

Researcher: Majeed .H

Guide: Dr. Humayoon Kabir .S

Subject: Library and Information Science

Tourism is considered as one of the sectors which can drive Kerala economy and take the state to the pinnacle of socio-economic development. The study seeks to examine the information needs and information seeking behaviour of tourists visiting Kerala and to understand how they make impacts on the available library services. The scope of the study also includes a serious look into impediments, if any, of the present tourist information system available in Kerala and suggests feasible and viable remedies to make the information system effective and well functioning one. While doing so, an attempt has also been made to systematically design a tourist information system for Kerala. The major findings are: Tourists generally need two types of information - static and dynamic. Tourists give priority to information required for safe travel, good accommodation and quality food rather than information about attraction and culture of the destination. Tourists will receive maximum information when the required information is received through their preferred communication channel. Well informed tourists will stay in Kerala for longer period. As the duration of stay is increased, tourists are facing more complex difficulties in seeking the required information. Even though Kerala has a very good public library system, only a very few percentage of tourists have visited the libraries in Kerala either directly in person or remotely through Internet, for getting tourism information. Several factors contribute to the underutilization of libraries in Kerala by the tourists, like; lack of knowledge of tourists about the availability of tourism information in libraries, difficulties in locating a library near to the tourist destination, absence of online presence by majority of rural libraries, lack of awareness about the availability of library services through internet etc. The facilities and services provided to the tourists by the libraries in Kerala are below average, and it is not adequate enough to attract tourists to the State.

Major publication appeared in: KELPRO Bulletin

Total No. of pages in the thesis : 416

Total No. of reference cited in the thesis: 241

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Title: “An evaluative study of Library and Information Centres in the field of Allopathic Medicine in Kerala”

Researcher: Saji S. Nair

Guide: Dr. G. Devarajan

Subject: Library and Information Science

This study attempts to unfold the infrastructure and state of affairs of academic medical libraries in Kerala. Library committee is constituted in majority of libraries. Libraries do not follow consistency in business hours. Independent library building and fully air-conditioned library space is available in less number of institutions. The professional staffing situation is overall a rather dismal one. The library share of total institutional budget is marginal and not incremental. Libraries are amassed with a good collection of print resources, while E-Resource collection is not satisfactory. All the libraries integrated ICT infrastructure, but its extent of adoption varies. Most of the medical college libraries are not strictly complying with all the requirements of Medical Council of India. The sector-specific academic medical libraries (Government, private, cooperative and autonomous) differ in key infrastructural and operational aspects and hence shortcomings prevail. Majority of medical professionals of academic medical institutions in Kerala do not perceive their institutional central library as a prime source of information support. The central library facilities are not extensively utilized by patrons. Majority of users were not completely satisfied with physical facilities, print and E-Resources, ICT facilities, library services, and present library timings. User expectations pointed the need for harnessing technologies and other infrastructural improvements. There exist lacunae in academic medical library system of Kerala, but it does not mean that the present state of library affairs is deplorable. Even though a lack of momentum persists, libraries in this domain are on the way to re-design conventional systems with technology-powered capabilities. To ensure ‘long term health’ of medical education and healthcare in Kerala, time is ripe to modulate these libraries in tune with needs and aspirations of its users, which do not remain static all the time.

Keywords: Library and Information Science, Medical libraries, Kerala, Library surveys

Major publication appeared in: KELPRO Bulletin

Total No. of pages in the thesis: 346

Total No. of reference cited in the thesis: 376

Email of Researcher: sajikalliyoor@gmail.com

Title : “Restructuring the Services of Public Libraries in Kerala on Scientific and Technological Basis.”

Researcher : Sasikumar .V

Guide : Dr. C. V. Rajan Pillai

Subject : Library and Information Science

The study is an investigation into the present state of public libraries, libraries which are established and administered by the people themselves, of Kerala. It examines the various aspects of their organization, administration, physical facilities, finance, manpower and other infrastructure including the use of Information and Communication Technology. Public libraries of Kerala were very vibrant in their functioning and acted as the nucleus of the various activities of the people around them. The public library movement of Kerala, factors that led to their development and the contribution of the public libraries towards the overall development of the state has also been studied. The study revealed that majority of the public libraries of Kerala were neither scientifically organized, nor their collection was classified and catalogued using library and information principles and practices. Poor financial support, severe shortage of qualified library professionals and the lack of poor infrastructure for the implementation of modern technology were the main reasons for their poor performance. The study focused on the Kerala State Library Council, the controlling body of the state public libraries, the need for reorganizing them scientifically using modern technology so that they could serve effectively and provide information and services to the present needs of the society. The study also put forward suggestion and recommendation for their improved functioning. along with a network model suitable for the public libraries of Kerala. The network called KEPLIC (Kerala Public Library Consortium) proposed to be located at the Kerala State Library Council in which individual libraries, the State Central Library, networks of government and digital archives are included.

Keywords: Public Library, Kerala Grandhasala Sangham, Kerala State Library Council, Information and Communication Technology, Library Network.

Major publication appeared in: KELPRO Bulletin Vol 17(1) June 2013.

Total number of pages in the thesis: 293

Total No of reference cited in the thesis: 224

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Stream: Social Science
Subject: *Management Studies*

Title: “A Study on Investment Behaviour of Keralites in Capital Market”	
Researcher : B. Rajendran	Guide: Dr. K. Sasikumar
Subject: Management Studies	
<p>This research is a detailed study of Investment behaviour of Keralites in Capital Market. The Capital Market is essential for long-term capital formation and have significant role to promote larger mobilization of savings and channelizing to productive sectors. Hence the study attempts to identify the reasons for the <i>low participation in Capital Market and to study in depth the investment behaviour of Keralites in the Capital Market</i>. The principle of economic growth focuses on generating savings and channelizing them into productive investment. Even though, the Indian stock market surpassed many of its previous records but the number of Keralites who are investing in capital market is still very low. Many research studies conducted in Kerala revealed that a large portion of investment may be physical assets or financial assets in the form of bank deposits, chitties, PF deposits and other low interest bearing securities. The major objectives of the study was to study the savings motives, investment pattern and investment behaviour of investors in Kerala towards Capital Market. The major findings includes the income level of investors do show a significantly different preference to investment. The Educationally qualifies, employed, Tax payers, High Income Group and Urban population shows more interest in Capital Market. For the purpose of the study 750 investors were selected and the data were collected through questionnaire. The study attempts to identify the reasons for the low participation in Capital Market and to study in depth the investment behaviour of Keralites in the Capital Market.</p>	
Keywords: <i>Capital Market, Money Market, Savings, Investment, Mutual Funds</i>	
Major publication appeared in: Management Researcher and Kerala Calling, KICMA Reach	
Total No. of Pages in the thesis: 369	
Total No. of reference cited in the thesis: 294	
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Title: “Electricity Pricing Strategy - A Case Study of Kerala State Electricity Board”	
Researcher : E. Mohammed Shereef	Guide : Dr. C. Ganesh
Subject : Management Studies	
<p>The Electricity pricing is a complex issue on account of various factors such as statutory constraints, social obligations, and nature of the product. There is a compelling need to rationalize the tariff for the efficient utilisation of the resources. Models have been developed for annual electricity consumption for domestic, commercial, industrial and HT&EHT consumers. The growth in consumption during the last one decade was high for railway traction followed by domestic where as it is low for EHT and HT categories. The power purchase cost constitutes the major share of electricity cost. The average tariff was the lowest in Sikkim and highest in Assam during 2010-11. The focus is given to distribution because it has been least studied and is a natural monopoly coming as the last mile link between the consumer and utility. The domestic consumers in Kerala are against privatisation and opined that the performance of KSEB improved. Domestic consumers are not willing to pay the actual cost and want the subsidy to continue. There should be a ceiling to avail the subsidy. The per capita consumption of household increases with income and the large part of subsidy goes to the richer sections of the society. The low income group households still use incandescent bulbs. Majority of the respondents agreed to reduce their consumption further. Also majority of the consumers are ignorant about the increased price during peak hours. So there is a scope for energy conservation. The electricity demand is income elastic. The monthly income, connected load, family size, house area and unemployed family members are identified as the main determinants of household monthly electricity consumption. These determinants have a positive correlation with electricity consumption. The electricity consumption and its determinants have been regressed and developed an electricity demand model for households.</p> <p>Keywords: Electricity, Tariff, Consumers, Determinants of consumption, Electricity demand, Household income, Electricity conservation, Income elastic, Power sector, Aggregate revenue requirement.</p>	
Major Publication appeared in: Commerce & Business Researcher Total number of pages in the thesis: 280 Total number of references cited : 150 Email of the Researcher : emdshereef@gmail.com	

Title: “An Analytical Study on Investment Behaviour of Retail Investors and Techno Fundamental Models for Retail Investment Decisions”

Researcher: M. Rakesh Krishnan

Guide: Dr. C. Ganesh

Subject: Management Studies

In the contemporary context saving and investment decisions play a focal role in the financial wellbeing of an individual. The phenomenon of how perceived importance of investments determines one’s investment domain knowledge and how investment domain knowledge determines his level of correctness in making investment decisions is the focal area in this study. Active investors in Kerala with more than 2 years of trading experience in equity segment with a recognized stock broker/sub brokers constitute the population of the study. The study was conducted using self-reported responses from 496 samples. The study developed a Structural Equation Model (SEM) to explain phenomenon of Investment Importance Perception in Equity Shares (IIPe) predicting the Investment Domain Knowledge (IDK) and subsequently IDK predicting Correctness of Judgment in Investment Decisions in Equity Segment (CJe). The measurement models for IIPe, IDK and CJe respectively are formed through Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). The results of EFA indicated a two factor structure for IIPe -> Enduring Importance of Investments for Financial Well Being (EIIFWB) and Acceptance of Equity Shares (AES). The reliability these scales are tested using appropriate tools before testing the final model. The internal consistency is determined using a reliability coefficient referred to as Cronbach’s alpha (Cronbach, 1951). The result of reliability indicated Cronbach’s alpha at 0.852 for EIIFWB, 0 .85 for AES, 0.801 for IDK and 0.75 for CJe. Thus, all scales/sub scales showed good indication of reliability. Further, the basic conceptual criterion pertaining to scales construct validity is ensured by examining whether the thoroughness with which the construct to be scaled and its domain were explicated and the extent to which the scale items represent the construct’s domain. The study found the integrated model explaining the IIPe predicting the IDK and subsequently IDK predicting the CJe fit with the data. Various model fit indicators reported are GFI .913, AGFI .884, CFI .952, TLI .942, RMR 0.084 and RMSEA .055. The indirect paths of EIIFWB and AES respectively predicting CJe through IDK are found significant ($p < .05$). However, the direct paths of EIIFWB and AES predicting CJe are insignificant ($p > .05$) in the presence of IDK as the mediator, indicating a full mediation model.

Major Publication appeared in:

1) Rakesh Krishnan, M., & Ganesh C. "Measuring Investment Importance Perception in Equity Shares: A Scale for Individual Investors. | *Drishtikon: A Management Journal* 6, no. 2 (2015): 59-82. 2) Rakesh Krishnan, M., & Mobin Chandy Eapen. "An Emprical Analysis of Weekend Effect on Indian Stock Marketwith Reference to Sensex and S&P CNX NIFTY." *Management Researcher* 20, no. 4 (2014): 4-14. 3) Rakesh Krishnan, M. —Impact of Foreign Direct Investments on the Gross Domestic Product: A Study on Indian and Chinese Economy. | *International Journal of Financial Management* 3, no. 4 (2013):30-34. 4) Rakesh Krishnan, M., & Ganesh C. (in press) "Investment Importance Perception in Equity Shares Determining Investment Domain Knowledge: A Study of thenPhenomenon on Individual Investors. | *Indian Institute of Management Shillong(IIMS) Journal of Management Sciences*. 5) Rakesh Krishnan, M., & Neethu Mohandas. —A Study on Factors Influencing Leverage of Indian Companies. | *Journal of Commerce & Accounting Research* 2, no. 1 (2013): 29-33. 6) Rakesh Krishnan, M., & Ganesh C. —Implementing Corporate Sustainable Development: A Case of an SME from India. | *South Asian Journal of Business andManagement Cases* 3, no. 2 (2014):169-177.

Total number of pages in the thesis: 201 pages

Total number of references cited in the thesis: 90

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Title: “Business Management Education in Kerala-A Strategic Analysis”	
Researcher: Sheena .K	Guide: Dr. J. Rajan
Subject: Management Studies	
<p>This research is a systematic evaluation on the status of Business Management Education in Kerala through the analysis of various management functions and parameters of the B-Schools. Little systematic researches had been conducted to address the overall functioning of the effective management education in this state. Present study attempt to identify parameters for successful B-Schools and the expectation of the business community regarding the Curriculum of B -Schools. Students and faculty members of the three categories of B-Schools viz, Self-Financing, Department of Management Studies (Government) and Co-operative colleges were comparatively analyzed to identify the successful parameters for the best B-Schools in Kerala. The comparative analysis of Students, Faculty members and Industry people predicted the inter correlation between the curriculum of the B-Schools and expectation of the business community. In the light of analysis, I suggested an administrative frame work for effective functioning of B-Schools in the state of Kerala. The study reveals that, irrespective of the categories, academic and administrative functioning of B-schools in Kerala is satisfactory. Even though there is a functional disparity exist among the categories, all the faculty members and students are satisfied with present functioning of B-schools in the state. The study suggested to include i) Six months compulsory internship in the industry for MBA students, ii) Periodical revision of Curriculum to incorporate relevant industry requirements, iii) Promotion of Entrepreneurial skills for new startups and iv) Widen the Industry-Academia Interaction.</p> <p>Keywords: Management Functions, Business Community, Curriculum, Pedagogy, Industry-Academia Interface, Entrepreneurial Skills.</p>	
<p>Major publication appeared in : Review of social sciences Total Number of pages in the thesis: 358 Total number of references cited in the thesis: 426 Email of the researcher: sheena_b74@hotmail.com</p>	

Title: “A Study on Entrepreneurial skill among professional students”	
Researcher: Sheena .N	Guide: Dr. J. Rajan
Subject: Management	
<p>Entrepreneurial skill, quite distinct from other skills, holds the key for economic development of any region in modern times. In Kerala where the problem of unemployment among the educated youth can be effectively solved only if a large number of professionally educated youth especially those who are in MBA and Engineering, who can acquire and better understand the various aspects of entrepreneurial skill, are encouraged to launch self employment schemes of their own. The main focus of the Study is the general perception of the engineering and MBA students on the different aspects of skill in relation to entrepreneurship and also on the effects of the factors influencing the acquisition of entrepreneurial skill. Statistical techniques like Percentage analysis, Kruskal-Wallis Test involving Chi-square, Correlation and Regression models, ANOVA (Analysis of Variance) are used for the Study. The students’ views on many aspects of entrepreneurial skill differ according to their educational qualifications. But there is no regional variation in this regard. The study showed the most determinant factor of entrepreneurial skills is personality traits and this is followed by social valuation, personal attitude. Students perceive that they do possess some kind of entrepreneurial skills despite their different levels of education, they showed intention and positive attitude towards entrepreneurship, and they have the perception that they possess some personality traits for undertaking entrepreneurial activity. Also the study showed significant differences in the inputs provided by government agencies and educational institutions to students in inculcating entrepreneurial skill. There is no indication to suggest that the professional colleges in Kerala are bent upon transforming their students to technocrat entrepreneurs by their own facilities or with the support or assistance of external agencies. However, if there are organised efforts to develop entrepreneurial skill of at least some section of interested B.Tech, M.Tech and MBA students, it would definitely boost economic activities in the State. Since the Kerala economy is susceptible to absorb any amount of additional investment involving people with entrepreneurial skill, it is absolutely necessary to educate students at all levels about entrepreneurship.</p> <p>Keywords: entrepreneurial skill, entrepreneurship, social valuation, personal attitude ,agencies</p>	
Major publication appeared in: Review of Social Sciences.	
Total No of pages in the thesis: 238	
Total No. of reference cited in the thesis: 198	
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Stream: Social Science

Subject: *Philosophy*

Title : “An Epistemic Inquiry Into The Nature And Function of Religious Language.”	
Researcher : Thushara .C .S	Guide : Dr. Lekshmi .R
Subject : Philosophy	
<p>There exists a close relation between language and knowledge since many of the questions involved in philosophy of language like truth, meaningfulness etc. are at once epistemological issues. In an age of science and technology, questions pertaining to religion or faith may not sound rational or logical. Hence its epistemic status is highly debatable which the central theme of this thesis is. By religious language is meant the concepts of propositions pertaining to God or other aspects related to religion. The nature of such a language can be evocative, imperative, paradoxical, analogical, prescriptive or symbolic. Hence its truth or meaningfulness needs to be analysed. If the statements of religious assertions are founded in a belief of the ‘Divine’, then its epistemic status can be explained in terms of foundationalism. Otherwise, in the absence of a central concept of God or Divine, religious language seeks explanation in terms of antofoundationalism. It also leads one to see whether meaning is to be determined by verification or is it experientially and contextually based. It further tends to see whether the literal meaning or contextual meaning is more significant. Verbal testimony or sruti pramana is considered as a valuable source of knowledge in the Indian context of religious pronouncements. Whether testimony is an independent pramana, whether it contributes to justified true belief etc. demand a detailed analysis. Religious statements of sacred texts need to be interpreted and hence the significance of hermeneutics cannot be ignored. Paul Ricoeur’s and Mimamsaka’s contributions deserve special mention in this context.</p>	
Major publication appeared in : The Vedanta Kesari	
Total number of pages in the thesis : 220	
Total number of reference cited in the thesis : 105	
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Title: “Ecology and <i>Yoga</i> Philosophy”	
Researcher: Sreevidya .P .S	Guide: Dr. D. Nesy
Subject: Philosophy	
<p>Today, ecology has become an object of wide-spread popular interest in interdisciplinary studies and <i>yoga</i> is one of the most revolutionized areas of Indian philosophy which has gained considerable attention in recent times. It is therefore most appropriate that ecology and <i>yoga</i> philosophy be given equal attention both in the context of scientific and philosophical studies. This interdisciplinary research, look for the possibilities of the implementation of ethical principles of <i>yoga</i> in the domain of ecology. Ecology is the most appropriate realm to the application of ethical principles of <i>yoga</i> because, the issues related to ecology is not only scientific but also the result of man’s behavior patterns and careless attitude towards nature. The implications of the ethical principles of <i>yoga</i> in the domain ecology bring forth ecological virtue ethics. It offers a systematic framework for the understanding of the character traits and types of action that cause problems for the environment. The data collected mainly from the literature sources such as text books, magazines, journal articles and news papers are practically implemented to drawing findings and suggestions. The methods were be used to meet the objectives are historical, comparative, analytical, descriptive, and evaluative.</p>	
Keywords: <i>Yoga</i> , Ecology, Ecological Virtue Ethics	
Total No of pages in the thesis: 215	
Total No of reference cited in the thesis:166	
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Stream: Social Science
Subject: *Physical Education*

Title: “AN ANALYSIS OF PERSONALITY AND EMOTIONAL COMPETENCE OF ATHLETES”

Researcher : Charles A. Joseph

Guide : Dr. Shailaja Mohan

Subject : Physical Education

The study is related with personality and emotional competence which is essential to assess individual personality of athletes and their competent ability. The main objective of the study is to measure the emotional competence and personality of athletes belonging to Track & Field, Volleyball, Football and Basketball and to compare emotional competence and personality of athletes belonging to various age groups (junior, youth and senior) in Track & Field, Volleyball, Football and Basketball. The questionnaires used for the study was Eysencks’s Personality Questionnaire Revised (EPQ-R) by Eysenck H. J and Eysenck S. B. G (1975) and Emotional Competence by Sharma H C and Bharadwaj R (1995). 960 male athletes were selected from Junior (16-18), Youth (19-21), Senior (+22) from Track & Field, Volleyball, Football and Basket ball with a minimum of 150 subjects in each sports. The athletes with at least District level competition were selected. Descriptive statistics such as mean, standard deviation and comparative statistics such as one way analysis of variance has been used. Coefficient of correlation was applied to measure the degree of interrelationship in various sub factors of EPQ-R and Emotional Competence Scale. In all the statistical tests, the level of significance was chosen to be 1% or 5% and if the calculated P-value (Probability of Type I Error calculated from the sample, in statistical terminology) is less than 0.01 or 0.05, there exists statistically significant mean difference between the groups. All the statistical analyses were carried out with the help of Statistical Package for Social Sciences (SPSS 19.0 version) for WINDOWS. The result shows that there exist a significant difference in the Personality and Emotional competence factors of various sports and age groups. For the total sample in various sports, the dominant personality factor is Extraversion followed by Neuroticism and Psychoticism. And in Emotional competence for the total sample in various sports 57.6% of athletes belongs to average competence, 22.3% belongs to competent level and 20.1% of athletes belongs to Incompetent level. The study indicates that emotional competency and personality will help the athletes to know their psychological ability and to perform at their level best.

Key words: Personality, Emotional competence, Extraversion, Neuroticism, Psychoticism.

Major Publication appeared in: m R N A

Total No. of pages in the thesis: 184

Total No of reference cited in the thesis: 101

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Title: **“ISOLATED AND COMBINED EFFECT OF THERABAND RESISTANCE EXERCISE AND MEDICINE BALL EXERCISE ON SELECTED PHYSICAL FITNESS, PHYSIOLOGICAL, PSYCHOLOGICAL AND BIOCHEMICAL VARIABLES OF SCHOOL BOYS”**

Researcher: Deepak .S .S

Guide: Dr. K. K. Venu

Subject: Physical Education

The purpose of the study was to find the effect of isolated and combined effect of Theraband resistance exercise and Medicine ball exercise on selected physical fitness, physiological, psychological and bio chemical variables of school boys. To facilitate the study 80 boys from Army Public School, Trivandrum District were randomly selected as subjects and their age was between 14 and 15 years. They were assigned into four groups of which one group served as Theraband Resistance exercise groups, second group served as Medicine Ball exercise group, third group served as combined Theraband Resistance exercise and Medicine Ball exercise group and the fourth group served as control group. The study was formulated as a true random group design, consisting of a pre test, mid test and post test. The subjects (n=80) were randomly assigned to four equal groups of twenty each. The groups were assigned as Experimental Groups I, II, III and control group respectively. Pre tests were conducted for all the subjects on selected physical fitness, physiological, psychological and biochemical variables such as Abdominal strength, Shoulder strength, Leg explosive strength, Resting pulse rate, Breath Holding Time, Systolic Blood pressure, Anxiety, Aggression, Stress, Plasma content, RBC and haemoglobin content. The experimental groups participated in their respective theraband practices, medicine ball practice and combined theraband exercises and medicine ball practices for a period of eight weeks. The midtest tests and post tests were conducted on the above said dependent variables after a period of theraband resistance practice, medicine ball practice and combined theraband resistance and medicine ball practices. The training programme was scheduled at 6.30 to 7.30 a.m. on 3 to 4 days in a week. Various tests were conducted to find out Abdominal strength, Shoulder strength, Leg explosive strength, Resting pulse rate, Breath Holding Time, Systolic Blood pressure, Anxiety, Aggression, Stress. Blood sample was collected for RBC count, Plasma content and haemoglobin test. To find out the difference between the pre test, mid test and post test, repeated measures ANOVA was used. Whenever it found significant, the Newman kuels post-hoc test was administer. Analysis of covariance (ANCOVA) was applied and whenever the adjusted post-test means were found significant, the scheffe's post-hoc test was administer to find out the paired means difference. To test the obtained results on variables, level of significance 0.05 was chosen and considered as sufficient for the study. The result reveals that the combined group (Theraband resistance exercise and Medicine ball exercise) have shown increased level of abdominal strength, shoulder strength, leg explosive strength, blood pressure (systolic), breath holding time, hemoglobin content, RBC and plasma level and decreased level in anxiety, aggression, stress level and resting pulse rate than the Theraband resistance exercise, Medicine ball exercise and control group.

Keywords: Theraband, Medicine ball, Abdominal strength, Shoulder strength, Leg explosive strength, Resting pulse rate, Breath Holding Time, Blood pressure, Anxiety, Aggression, Stress, Plasma content, RBC and haemoglobin content.

Major Publication appeared in: Gurujyothi Research & Reflections (ISSN 0976-0865)

Total No. of pages in the thesis: 203

Total No of references cited in the thesis: 85

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Title: “EFFECT OF AEROBIC EXERCISE PROGRAMME ON BLOOD GLUCOSE, HEALTH RELATED PHYSICAL FITNESS AND QUALITY OF LIFE OF TYPE II DIABETIC PATIENTS”

Researcher: Jacob George

Guide: Dr. Usha Sujith Nair

Subject: Physical Education

The purpose of the study was to determine the Effect of Aerobic Exercise Programme on Blood Glucose, Health Related Physical Fitness and Quality of Life of Type II Diabetic Patients. The variables selected were Fasting Blood Sugar, Post Prandial Blood Sugar (Blood Glucose), Flexibility, Strength, Endurance, Body Fat (Health Related Physical Fitness) and Quality of Life in total and its four sub domains that is : Physical, Psychological, Social and Environmental. The objectives of the study are the following (a) To determine the effect of aerobic exercise programme on fasting blood sugar and postprandial blood sugar in Type-2 diabetic patients. (b) To investigate the effect of aerobic exercise on health related physical fitness components in Type-2 diabetic patients and (c) To find out the effect of aerobic exercise on the quality of life in Type-2 diabetic patients. Descriptive statistics were used to find the mean and standard deviation. ANCOVA was used for the comparison among different stages in the experimental and control groups. Scheffe’s post hoc pair-wise comparisons in different stages of control and experimental groups were done to find any significant stage wise difference. In the case of experimental group who underwent training programme, significant improvement were seen in all the selected variables that is : Fasting Blood Sugar, Post Prandial Blood Sugar , Flexibility, Strength, Endurance, Body Fat and Quality of Life in total and its four sub domains that is : Physical, Psychological, Social and Environmental following the training programme. When compared stage wise, significant differences were seen among all the variables. While in the case of the control group no changes were seen in any of the variables during the training period. The results of the study suggest that twelve weeks of aerobic exercise programme would result in decreasing the Blood Glucose level, improve the status of Health Related Physical Fitness and Quality of Life of Type II Diabetic Patients.

Total no. of pages in the Thesis: 171

Total no. of references cited in the Thesis: 177

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Stream: Social Science

Subject: *Political Science*

Title: “ENVIRONMENTAL AND SOCIAL DIMENSIONS OF BACKWATER TOURISM IN KERALA”

Researcher: Christin Solaman .S .S

Guide: Dr. L. Thulaseedharan

Subject: Political Science

Kerala, one of the prime tourist destinations in India, shows a high growth rate and backwater tourism contributes a considerable part to this by way of increased arrival of domestic as well as foreign tourists and generates income from this. This research is the detailed analysis to explain the problems like socio-economic and political in the back water tourism, the hall mark of Kerala tourism and suggest measures, to flourish the tourism sector in a healthy, environment friendly, attractive, sustainable and participatory manner. This study drives into this and dwells into the positives & problems faced by the backwater tourism to the people. It tries to understand the social, economic and environmental dimensions of tourism in Kerala, to analyse the problems and possibilities of backwater tourism in Kerala with reference to the three districts, namely, Alappuzha, Kollam and Kottayam, to analyse the social and environmental impacts of backwater tourism, to explore how backwater tourism has affected the life and living of local people, to explore how far backwater tourism has contributed to the socio economic development of the area, and also analyse how far political and policy changes affect tourism in Kerala. The study hypothesized that In Kerala, backwater tourism has played a significant role in employment generation and socio-economic growth. Extensive commercialization and business attitude of key players in the tourism sector have resulted in social and environmental hazards. The management and administration of backwater tourism have lacunae due to improper planning and lack of imagination. Backwater tourism sector failed to ensure local people's participation in its developmental activities. The study adopted the methods like traditional methodology and participatory approach. Data collected from both secondary and primary sources. For the primary data collection was done using structured questionnaires by using Stratified random sampling. Category wise representation of respondents and geographical coverage were the factors represented in the sample of three main districts. Following are my findings. This study has revealed that Backwater Tourism has played a significant role in employment generation and socio-economic growth of Kerala. But, the local community, is getting only very little benefit. There exists shortage of proper planning and imagination from the part of tourism management and administrative functionaries. The study calls for more concerted efforts, planning imagination and creativity from the Kerala Tourism Department. It reveals that little importance have been paid by the administrators and other stakeholders in the field to ensure local participation, addressing their concerns, listening to them and valuing their traditional knowledge while planning and implementing tourism developmental activities.

Keywords: Backwater Tourism, Socio Economic Conditions, Environmental Dimensions, Houseboats

Major publication appeared in: Holistic Thought, The Multidisciplinary Research Journal of S.N.College.

Total No of pages in the thesis: 249

Total No of reference cited in the thesis: 109

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Title: “Socio-Political Transformation of Kerala and Mannathu Padmanabhan: A Leadership study”	
Researcher: Preetha .G .S	Guide: Dr. G. Radhakrishakurup
Subject: Political Science	
<p>This research is a detailed and systematic analysis of the role of Mannathu Padmanabhan for the socio-political transformation of the Kerala society. Both historical and analytical methods were used for this study. Nairs were in a very deplorable condition at the end of the 19th century. Community on the whole has been declining economically, socially and politically during this period. Mannathu Padmanabhan is disgusted to the degeneration of his community. With his charismatic personality and leadership qualities, Mannathu Padmanabhan tried to reform the Nair community. NSS formed in 1914 under his inspiring leadership not only rejuvenated the Nair community but also contributed to the building up of a modern Kerala. The way in which Mannam mobilized resources and implemented various projects will be a source and strength of all Malayalees to come. It can be concluded that Mannathu Padmanabhan through his dynamic leadership transformed the Nairs of Kerala and prepared them for social and political mobilization and to strive for a better standard of life. Mannam was a leader with a vision, insight, commitment and organizing skills. He dedicated his life to transform the Nair community and to modernize the caste-ridden traditional society. An incomparable leader and a leading light in the social and political renaissance in Kerala, Mannathu Padmanabhan instilled a new life to Nairs thereby opening a new chapter in the history of Kerala. The history of Mannam’s long years of dedicated and unblemished life and work as a social transformer is bound to remain a perennial source of inspiration to all the Malayalees in the years to come.</p>	
Major Publications appeared in : University College Journal of Politics & Society Total number of Pages in the thesis: 223 Total No of reference cited in the thesis: 200 Email of the Researcher: preethags 2013@gmail.com	

Title: “Globalisation, Agrarian Crisis And Farmers’ Distress: A Study of Wayanad District, Kerala”

Researcher: Seena Thomas

Guide: Dr. K. S. Pavithran

Subject: Political Science

Globalisation expands the economic activities across political boundaries of native states. It makes world as a small village. As for us India is concerned the official inauguration of globalisation was in the year of 1991 when Narasimha Rao government signed an agreement with the institutions of International Monetary Fund(IMF) and World Bank for bringing structural adjustment programme. It is the process which integrates the domestic market with world market for international trade, finance, and goods and services. The new economic policy and its new trends emerged in the agricultural sector. The Indian agricultural sector performed under various constraints. This situation was quite disturbing in Wayanad district of Kerala. Agriculture is still the back bone of Wayanad economy with nearly 90 percent of work force depending on agriculture for their livelihood. The district has been in public eyes in the recent years due to the large-scale farmers’ suicides. Indebtedness is one of the major factors for farmer suicides and agrarian distress. In Wayanad, agricultural crops are market oriented and export oriented crops. The fall in the price of agricultural products is a worldwide phenomenon and has direct links with neo-liberal reforms. The present study mainly focuses on globalisation, agrarian crisis and farmers’ distress.

Major publication appeared in: Institute for the Study of Developing Areas Journal(ISDA)

Total no. of pages in the thesis: 332

Total no. of reference cited in the thesis: 228

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Stream: Social Science

Subject: *Social Work*

Title: “THE ROLE OF ELECTED WOMEN REPRESENTATIVES IN THE FUNCTIONING OF PANCHAYATI RAJ INSTITUTIONS IN KERALA SINCE 1994”

Researcher: Sabu P. Thomas

Guide: Dr. S. P. Revikumar

Subject: Social Work

Kerala Panchayati Raj Act, 1994 provided for 33% reservation of seats and positions for women which was raised to 50% in 2010. As a result of these steps lots of women got an opportunity to get into the Panchayat administrative system. The study examined the present scenario of the role of Elected Women Representatives (EWRs) in the functioning of Panchayati Raj Institutions. An EWR was member of minimum 8 committees and a maximum of 19 committees out of a total of 19 committees in the region and area analysis. The average Leadership Performance Score (LPS) of the respondents was 2.74 and the average Decision Making Performance Score (DMPS) was 2.71 out of three. The average leadership quality score of the EWRs was 4.41 in which the minimum was 3.55 and the maximum was 4.91. The average decision making quality score is 4.57 in which the minimum is 3.56 and the maximum is 5.00. The respondents performed ‘always’ well in the planning, implementation, monitoring, and evaluation function for the six possibilities. The average planning function score was 2.74, the average implementation function score was 2.70, the average monitoring function score was 2.52, the average evaluation function score was 2.60, and the total function score was 2.64. The opinion on the role performance of EWR by themselves showed that majority of the respondents were positive about their response and so they said that their role performance was ‘good.’ 23.8% said that their role performance was satisfactory and 22.6% said that their role performance was very good. Data from the general public/voters showed that in the opinion of 70% of the respondents there were positive changes in the Panchayat after the entry of more women as representatives due to reservation of seats. The average values of issues and problems faced by EWRs were calculated and it was found that high mark (1.86) went to the ‘problems created by the public who did not get benefits from the Panchayat’. As a result of the involvement of EWRs in the Panchayat administrative scenario, the Panchayats became more people friendly. But the stagnation in the Panchayat in the initial stages due to the inexperience of the EWRs needs to be taken care of by equipping them through continuous trainings from the beginning.

Key Words: Leadership, Decision Making, Planning, Implementation, Monitoring, Evaluation.

Major publication appeared in: *Loyola Journal of Social Sciences*

Total number of pages in the thesis: 372

Total number of references cited in the thesis: 199

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Title: “WOMEN EMPOWERMENT-ROLE OF MICRO LEVEL ORGANISATION IN NORTH KERALA”	
Researcher: Sunilkumar Yemman	Guide : Dr. Usha John
Subject: Social Work	
<p>Present study examined the positive influence of micro level organizations (MLOs) in women’s familial and household decision making and responsibility sharing on selected aspects of family life. A cross sectional descriptive study was conducted among 585 rural poor women in two northern districts of Kerala, using representative sampling procedure and a structured interview schedule. Data were analyzed using descriptive statistics and association test. The results reveal a significant change and improvement of women in terms of their income, savings, expenditure and livestock after joining MLOs. The poor women’s role in familial and household decision making was significantly improved with renewed social and familial status and increased social participation through MLOs. Women’s influence in decision-making and shouldering familial and household responsibilities viz., buying and selling, asset creation, investment, education and marriage of children, household activities, and relationship with relatives and neighbours, problem solving, disciplining children and healthcare were found to be increased after joining MLOs. The study concludes by reiterating the progressive role of MLOs in women’s empowerment.</p> <p>Keywords: women, socioeconomic, empowerment, MLOs</p>	
Total No.of pages in the Thesis: 206 Total no.of reference cited in the Thesis: 81 Email-syemman@gmail.com	

Stream: Social Science

Subject: *Sociology*

Title : “A SOCIOLOGICAL INQUIRY OF ELDERLY OUT-MIGRANT RETURNEES TO KERALA”

Researcher: Aswathy Zachariah

Guide : Dr. Jose Boban .K

Subject : Sociology

The sociological study of elderly out – migrant returnees to Kerala is a comprehensive research study including socio -gerontological themes with demographic profiling and psychological dimensions of this change in the lives of the elderly returnees to their place of origin. explore the complex, and sometimes conflicting, themes of family ties and their emotive strengths; comparative life styles in the place of origin and migrated place of destination; life course transitions and cultural affinity with place of origin; and psychological adjustment, belonging and attachment to place. The study found that the odds of being an aged out migrant returnee to Kerala were increased by being married, having close kin member in Kerala, having substantial income, having higher education, being without employment (retirement), having property and assets in Kerala, having an innate desire to return to roots, wishing to spend the rest of the life in Kerala and not to continue at the migrated place even when the conditions were suitable. Socio- economic and gerontological theories of life course ecology, relative deprivation and gender role identity difference brings the research well rooted in theoretical perceptions. There is a change in the life style of women after returning to Kerala. Compared to the life style, which was followed in the out migratory stage. The women felt a sense of loss of freedom, restrictions in many aspects of life, lack of social interaction within the community and more seclusion from the society. Family changes (empty nest), low financial capabilities, negative perception of self, widowhood, awareness of own mortality, declining physical reserves, low income, shrinking social networks are some of the determinants that add up for a low life satisfaction index for women elderly returnees. It is our social responsibility to take care of our aged returnees with all our resources and capabilities.

Keywords: Out migration, Elderly Return out migration, Place of origin, Place of destination, Life satisfaction, life style.

Major publication appeared in: Kerala Sociologist. Vol. XXXVIII. No. 2.

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Total No. of reference cited in the thesis: 240

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Title: “Empowerment of Women in Kerala Through Micro-enterprises”	
Researcher: Lekha .T. R	Guide: Dr. Shobha V. Nair
Subject: Sociology	
<p>The process of empowerment of women discussed in this study takes into account the social and economic empowerment of women through their participation in micro-entrepreneurship programmes promoted by the Kudumbasree (The State Poverty Eradication Mission) and the Non-Government Organisations. It was found that women were able to achieve social empowerment through participation in social and development activities of women collectives. Also, the participation in group discussions of SHGs and micro-enterprises, Gramasabha and awareness classes have made women socially independent and more knowledgeable. The economic empowerment that was analysed with regard to their increase in income, increase in assets, increase in savings, financial autonomy over income from micro-enterprises and on their dependency on money lenders, found that women could increase their assets and income with an alarming decline over dependency on moneylenders. The participation in the economic activities enabled women to make purchases in the form of gold, land, cattle and household equipment. Apart from the problems regarding transportation and inadequate marketing networks, the participation in various development activities of micro-enterprise increased their self-confidence, self-efficiency and self-esteem which have contributed to their overall self-transformation. The theoretical framework of the study based on Naila Kabeer’s empowerment framework and Amartya Sen’s Capability approach substantiates the findings of the study. The comparative role of the promoting agencies in enhancing the micro-enterprise was also analysed where Kudumbasree was found to provide more of financial support to micro-enterprises than NGOs but in providing other supports like skill trainings, follow-up in trainings, monitoring of enterprise and marketing support, NGOs excels Kudumbasree considerably.</p>	
Total no. of Pages in the Thesis: 219 Total no. of reference cited in the thesis: 180 e-mail of the Researcher: lekhaamc@gmail.com	

Title: “Development Induced Displacement: A Study of Displaced People in Kerala”

Researcher: Lekshmi Chandran

Guide: Dr. Abraham Vijayan

Subject: Sociology

Development projects such as urban expansion, roads, railways, airports, dams, ports, factories, industrial establishments, etc require vast stretch of land for its inception, erection and expansion. Kerala is a thickly populated state with predominately small land holdings and the acquisition of a small extent of land is likely to displace and deprive a lot of people. The people have to move out of their places for just mere monetary compensation. This study analyses the socio-economic problems of the displaced people and the emotional trauma that they face under the displacement process. It also analyses the displacement and resettlement problems of these people. A case study of one of the largest social movement witnessed in Kerala is also covered in detail- the organized movement of Moolampilly villagers against forced displacement and human rights violation. The study also suggests some basic guidelines that could be framed for the proper rehabilitation of the displaced people. Samples were collected from six large scale development projects in Kerala viz, Trivandrum International Airport, Cochin International Airport, Techno Park and Techno City Trivandrum, Smart City and Vallarpadam International Container Transshipment Terminal Ernakulam.

Keywords: Displacement, Compensation, Resettlement, Rehabilitation, Human Rights Violation.

Major publication appeared in: Kerala Sociologist, Journal of the Kerala Sociological Society

Total No. of pages in the thesis: 272

Total No. of references cited in the thesis: 197

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Stream: Arts and Humanities

Subject: *Arabic*

Title: “THE FEMINIST IDEOLOGIES IN THE WRITINGS OF LATIFA – AL-ZAYYAT A STUDY WITH SPECIAL REFERENCE TO THE NOVELS, SHORT STORIES AND DRAMAS.”

Researcher: Sihan .J

Guide : Dr. Ubaid .A

Subject: Arabic

A feminist literary critic, political activist ,essayist shortstory writer ,Latifa al Zayyat is one of the most distinguished women in Egypt and the Arab world. Latifa Al-Zayyat born on August 8,1923 in the delta city of Dumayath .Egypt to an established middle-classfamily .Al Zayyat benifited from her class interest in educating women. Between 1942and1946 she attended Cairo University ,where she also received a PhD in English literature in 1957 then she become a professor of English in the women’s collage there and was the head of the English department between 1976-1983.Latifa al zayyat has been involved in the struggle for national independence and the rights of the oppressed since the forties when she was an undergraduate she has become a symbol of integrity and commitment to the Arab masses. Latifa al zayyat has published influential works in the field of critical theory and literary criticism.Her works,in Arabic and English deal with American and English literature as well as Egyptian narrative and drama. Her writings on the images of women in Arabic novels and on the aesthetic of Naguib Mahfouz are seminal. She has also written cultural &political essays .Her novel (Bab al Maftuh)The open door 1960 has been a great success. Al –Shykhukha wa Qissas ukhra (old age and other stories)was considered a literary event .Arab Cultural circles have recently mourned the loss of the prominent Egyptian intellectual Latifa al zayyat ,who died of cancer in Cairo on September 10th 1996. She was 73 years old her death came soon after she had received Egypt ‘s highest state prize for literature .while the state acknowledgement of her achievement was long overdue, Al zayyat had much popular and collegial support through out her often difficult life journey .

This study will throw light on the works of Egyptian novelist Al zayyat.

Keywords:Derivation,Inflection,Compounding,Clipping,Backformation

Major publication appeared in: Vijnana Kairali

Total No of pages in the thesis: 234

Total no. of reference cited in the thesis: 84

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Stream: Arts and Humanities

Subject: *English*

Title: “Human Ecology and Urban Tectonics: Geopolitics of Mumbai through Suketu Mehta’s *Maximum City: Bombay Lost and Found* and Gregory David Roberts’s *Shantaram*”

Researcher: Anupama S. Varma

Guide: Dr. Maya Dutt

Subject: English

This thesis focuses on an analysis of the representation of the city of Bombay in Suketu Mehta’s *Maximum City: Bombay Lost and Found* and Gregory David Roberts’s *Shantaram*. The choice of the works was determined by the fact that they quite clearly showcase the transition the city has undergone over the decades. The main premise of the study is the physical and psychological changes that have come over the city as it metamorphosed from Bombay to Mumbai. The city is looked at through two sociological aspects, which make up the geopolitics of the city -- human ecology which refers to the denizens of the city, and urban tectonics which point to the changes wrought on the city, both in terms of infrastructure and attitudes. The methodology followed is a comparative analysis of fictional, non-fictional, cinematic, sociological and cultural representations of the city to see how it has evolved in all its myriad hues and forms, over the decades, with special focus on the works by Mehta and Roberts. The study also draws from Urban Theory and other socio-cultural concepts such as the Flaneur, and the spirit of the city, cosmopolitanism and subnationalism. The attempt of the study is to find out whether the clichéd idea of Mumbai as the city that never tires, a city that has an inexhaustible recuperative power is being stretched to extinction by repeated tragic setbacks. The thesis concludes that Mumbai is precariously poised on the edge of major tectonic shifts, in sociological terms. Increasing separatist sentiments, localization, cultural intolerance and infrastructural issues are the major fault lines that can break the dream city into a nightmare, if no appropriate solutions are found; such a scenario may find the city a fertile ground for subnationalism.

Keywords: City, Mumbai, Cosmopolitanism, Geopolitics

Major Publication appeared in: *Samyukta*

Total no. of pages in the thesis: 185

Total No. of references cited: 69

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Title: “A(Sexual) Poetics: An Enquiry into the Indian Bhakti Cult”	
Researcher: Dr. Uma Unnikrishnan	Guide: Dr. G. S. Jayasree
Subject: English Language and Literature	
<p>The study is an interdisciplinary study that spans from the 7th to the 17th centuries and investigates the riddling hagiographies and the rewritten historiographies sustaining the contemporary academic discourse in Hinduism which has been reduced into reading sexual textualities and phallic mediations into the theo-spiritual repertoire of Hinduism and particularly of mystic articulations over time. The research undertaken is an effort towards seeing the unseen and hearing the unheard through the very language that the articulations were syndicated through. By language, the word is not assigned its normative pedestal, but the research goes out beyond the dimension of the vocal word and tries to see the possibilities of parallel enunciations that arise out of mystic paradigms. The study takes a deeper look into the nature of consciousness itself that comes dovetailed with its several narratives through centuries of mystic experiences and phenomena in India. The attempt has been to gain historical insight into the evolution of the narrative through India’s ontological schools of thought which associates itself with obvious theological bearings. The research tries to gain into the epistemological foundations of thought, word and meaning and to the process and extents of representational delimitations in the process, especially with reference to mystical discourses. Towards these objectives the oral and written transmissions of Indian female mystics have been subjected to detailed interrogations, parsing open the links between consciousness and aestheticism in mystic articulation. The methodology pursued in the entire work of research stems from the grounded belief that each cultural production requires to be parsed through its own systemic devices and not through extrinsic frameworks which twist discourses to fit their frames. With this intent, an extensive reading of the fertile grounds of native narratives across the socio-cultural and theo-political spectrum have been undertaken. Threading through these narratives is a final examination of these media through theories employed in Buddhist feminist historiography in the quest to realize the theatrics of the body or lack of body and the mediation of gender paradigms in female mysticism as converged in the four mystics under study to gain a perspectival understanding of the meta-narrative of Bhakti mysticism.</p>	
Keywords: Consciousness, Bhakti, Mysticism, Poetry, Indian Aesthetics	
Major Journal Article in: Samyukta- A Journal of Women’s Studies	
No. of Pages: 438	
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Title: “And Quiet Flows the Pampa: Kerala Imagined in Select Novels of Malayali Women Writers in English”

Researcher: S. Devika

Guide: Dr. Maya Dutt

Subject: English

This study investigates how the socio-cultural structures of Kerala have been recreated by Malayali women novelists in English vis-à-vis (i) the caste and class divide with the attendant issues of feudal hierarchy, domination and discrimination; (ii) the gender issues in the institutions of family and marriage; (iii) the impact of religious conversion, spread of communism and migration to the Gulf countries in accelerating social change; and finally, (iv) the pivotal role of the environment. It primarily examines three works—Arundhati Roy’s *The God of Small Things* (1997), Anita Nair’s *The Better Man* (1999), and Geeta Abraham Jose’s *By the River Pampa I Stood* (2007). Nirmala Aravind’s *A Video, a Fridge and a Bride*, Jaishree Misra’s *Ancient Promises*, Manorama Mathai’s *Whispering Generations* and Shinie Antony’s *Kardamom Kisses* too have been studied to lend comprehensiveness to the discussion. In addition, four Malayalam novels are discussed to comment on the importance of geographic or linguistic positioning in the mapping of Kerala in fiction. It uses various Foucauldian concepts like power, resistance to power, deployment of alliance and sexuality, heterotopia, etcetera, to analyze the power relations operating in the society of Kerala. Caste dynamics offer paradigmatic examples of power relations and resistance. Various forces have been at play, at a macro-level of resistance, to bring about an alteration in the caste power configuration in society in the post-Independence period. Common instruments are used in the exercise of caste and patriarchal powers, and the latter is seen to be, to a certain extent, contingent on the dynamics of the former. In the power matrix of caste and gender, the environmental spaces become the heterotopic sites for transgressors to break the shackles of authoritarian power for a time. The educational zeal of the evangelists, the class war of the communists and the economic prosperity brought by Gulf migration have combined, in varying degrees, to effect this change. What has emerged from the reconfiguration is not a society without power structures but one in which power assumes a new aspect. Thus, Malayali women novelists in English have imagined Kerala as a society caught in the web of changes, a society that sees a transition from the rigidities of feudal, caste and gender orientations to a semblance of leveling in the modern times. Yet, it is a society which seeks to preserve old norms, a society where, though the power structures of the traditional caste society have been challenged, a new power diagram based on wealth has evolved; a society where, though ostracism practices have been abolished by law, caste feelings still lie ingrained in the minds of the people; a society where marriages still remain largely endogamous; a society where, though women have had the opportunity to be educated and employed, patriarchal strictures subject the woman to male control within family and marriage. Thus, there emerges a paradoxical picture of change co-existing with continuity as in a quietly flowing river.

Major publication appeared in: *English Activities Update*

Total No. of pages in the thesis: 286

Total No. of reference cited in the thesis: 170

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Title: “The Accents of Dissent: The Fictional World of Gao Xingjian”	
Researcher: Sruti Ramachandran	Guide: Dr. Maya Dutt
Subject: English	
<p>The thesis is an analysis of the various dimensions of “dissent” manifest in the fictional works of Gao Xingjian - <i>Soul Mountain</i>, <i>One Man’s Bible</i> and <i>Buying a Fishing Rod for my Grandfather</i>. The methodology situates dissent as the point of departure in negotiating certain tropes such as nationalism, iconoclasm, ideology, authority, culture and experimentalism which recur in Gao’s fiction. The nexus between literature and politics in twentieth century China provides the contextual grid for the study. The thesis attempts to read how political dissent, cultural dissent and narrative dissent brand Gao’s fictional oeuvre. His works, foregrounded against the Cultural Revolution, document with visceral detail the tenor of the times and engage in a counter-discursive reading of the Chinese political, social and literary space. Interpreting the self as a potential site of ongoing politico-cultural contrasts and transmutations, Gao champions the ‘voice of the individual’ amidst the cacophony of the collective. The writer effortlessly mixes autobiographical details with fictional techniques to create indelible portraits of daily life under a harsh, dehumanizing political regime. The thesis attempts at evaluating Gao Xingjian, one of the least known Nobel Laureates, as a writer who transgresses borders to create bridges.</p>	
Keywords: Chinese Literature, Dissent, Cultural Revolution, Autobiography	
Major publication appeared in: English Activities Update	
Total No of pages in the thesis: 192	
Total No. of reference cited in the thesis: 86	
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Title: “Missionary Negotiations of Modernity: Colonialism, Representation and Gender in Select Narratives of Amy Carmichael”

Researcher: Tara Mohan

Guide: Dr. Meena T. Pillai

Subject: English

Missionary representations and interactions with the categories of caste and gender provide valuable insights into the complex middle ground between rigid binaries and analytical extremes and serve to reveal that markers of difference such as caste and gender were contingently placed within a fluid system of constantly shifting relationships. The narratives of women missionaries offer complex arenas for investigating gender and caste relations and serve to reveal the potential instability of traditional gender divides, providing glimpses into the hybrid identities that evolved in the variegated spaces of colonial contact. These narratives are helpful in elucidating the centrality of gender and caste in the discourses of colonialism and modernity and the radical reconfigurations of these categories that took place in the contact zones. As local populations appropriated the so-called models of western civilization brought into play by the ‘mission of modernity’, what evolved was a complex, often ambivalent reshaping of ideas, identities and relationships along multiple axes of modernities. This study examines the writings of Amy Carmichael(1867-1951) and reads missionary narratives as a distinct genre of colonial discourse and cross cultural representation, unmistakably though ambivalently, intertwined with imperial discourses as a whole. A rethinking of colonial contact and an examination of the ruptures that troubled these discourses is attempted through an analysis of the nexus of colonialism, representation and gender in missionary narratives. Looking into the blurring of boundaries between fixed binaries and analyzing the ways in which the relationship between missionary and native was negotiated it probes the ambivalences and ambiguities that complicated and disturbed categorizations such as colonizer and colonized. It traces the complex relationships between colonialism and modernity and addresses the complex forms of emulation and resistance, complicity and conflict that missionaries engendered in the intimate spaces and contact zones of the colonial encounter, thus illustrating how missionary narratives are highly useful in shedding light on the spectrum of modernities that emerged within the colonial milieu and revealing how both colonizer and colonized, missionary and native are active participants in a range of interlocking narratives on modernity.

Publication appeared in *English Activities Update*

Total Number of pages in the thesis: 292

Total No. of references cited in the thesis: 151

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Title : **“Popular Spirituality: A Comparative Study of the Works of Kahlil Gibran and Paulo Coelho”**

Researcher: Varsha Basheer

Guide: Dr. Shameem .A

Subject: English

The main objective of this thesis is an analysis of the New age ‘spiritual genre’; to explore why it is in demand, and to study how spirituality has today come to embody the ‘re-enchancement’ of the modern west, and acquires resonance even in India. With such intent, select works of Kahlil Gibran (the Lebanese expatriate American) and Paulo Coelho (Latin American), who are considered best sellers in this genre, is taken up. Moreover a comparative analysis of their works has been carried out, and the basic ‘formulaic’ structure of New Age Spiritual Fiction is laid down. This research contends that though belonging to two different locales and ages, Gibran and Coelho remain, to a certain extent strikingly similar in their visions, though the mode of expression and narrative style is in variation. This study ascertains that their spiritual philosophy, when placed within a timeframe, clearly belongs to the ‘New Age’. The main texts selected are: Of Gibran- *The Madman* (1918), *Jesus the Son of Man* (1928), *The Wanderer* (1932), and ofcourse *The Prophet* (1923). And of Coelho, it is *The Alchemist* (1988), *Brida*(1990) *By the River Piedra I Sat Down and Wept* (1994) and *Veronica Decides to Die* (1998). This research distinguishes the terms Religion and Spirituality as it has come to signify different cultural practices in modernity and analyses the resultant birth of new age spiritualities; its basic tenets and historical antecedents. This thesis further ascertains that the social context of self-help fiction reading is more nuanced than presently acknowledged by evaluations of self-help ideology and consumerism. Hence, instead of viewing this particular self-help genre – New Age Spiritual fiction -as exploiting individual and social problems for material advantage, this study describes it as a spiritual subculture in which self-help reading is also a source of authority and an expression of subjectivity.

Key Words: Popular Fiction, Spirituality, Gibran, Coelho, Cultural Studies

Major publication in: English Activities Update

No of pages: 220

References cited: 208

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Stream: Arts and Humanities

Subject: *German*

Stream: Arts and Humanities

Subject: *Malayalam*

Title: “SAMOOHIKA JEEVITHA CHITHREEKARANAM BENGALI NOVALUKALUDE MALAYALA VIVARTHANANGALE ASPADAMAKKI ORU PATANAM”	
Researcher: Bhavana Joseph	Guide: Dr. N. Sam
Subject : Malayalam	
<p>The research is a detailed analysis of social life in Bengal during the renaissance period based on the Bengali novels translated to Malayalam. The methodology in Social Science is used for the research on the topic in this study. The cultural modulations and political sally of Bengal is strongly reflected in the Novels Pather Panjali and Aparajithan written by Bibhoothibhooshan Bandhopadhyay, ganadevatha and Arogyaniketanan written by Tharasanker Banerjee, Pradhamaprathiruthi, Suvarnalatha and Bekulinte Katha written by Asapoorna Devi, Nellinte Geetham Written by Savithri Roy. Hence these novels are selected for research and the study is based on these novels. It is the first attempt endeavored on the study of social life in Bengal. The research is concluded with the findings as follows: Kolkata was the center of the British rule in India. Indian Renaissance was began and centralized in Kolkata. Modern education was the root cause of renaissance. The British rulers, missionaries and the young leader in India, who conceived the neoteric movements of European renaissance, have propagated modern education in India. Despite of religion, caste and creed modern education provided better education and created revival in the social life all over Bengal. Western concepts of Democracy, Nationalism and revolutionary politics were spread all over Bengal. It paved way for elimination of caste system, obliquity, slavery etc. and also for the social awareness and social wellbeing of women. In short the renaissance developed in Bengal is the key of Indian renaissance</p>	
<p>Major publication appeared in: Vijnanakairali. Total number of pages in the thesis: 195 Total number of references cited in the thesis: 74 E-mail of researcher- bhavanajoseph26@gmail.com</p>	

Title : “ Ramacharithavruthangal a Study ”	
Researcher: R. Harichandran Achari	Guide: Dr. N. Sam
Subject: Malayalam	
<p><i>Ramacharitham</i> is the oldest text in Malayalam literature. This seminal text consists of 164 <i>padlanagal</i> (chapters) with 1814 <i>pattukkal</i> (stanzas) and encapsulates the salient features mentioned in <i>Pattuprasthanam</i> of <i>Lilathilakam</i>. <i>Ramayanakatha</i> observes that the first poem in Malayalam is <i>Ramacharitham</i>. One of the reasons attributed to the gradual decline of this once popular classical poem is the ignorance on the part of people who recited it without knowing the pattern to recite and read. This thesis examines the meter and rhythm of all the stanzas of <i>Ramacharitham</i> in the background of Malayalam metrical pattern which is dealt with in detail. The important role played by the metrical pattern of <i>Ramacharitham</i> in shaping Malayalam language, and the poetry written in later years is explained with examples. The linguistic, literary and cultural aspects of <i>Ramacharitham</i> are discussed in the context of the study of the metrical pattern. <i>Ramacharitham</i> has thirty three meters broadly divided into five sections namely <i>chatturmatravibhagam</i>, <i>pachamatravibhagam</i>, <i>shanamatravibhagam</i>, <i>saptamatravibhagam</i> and <i>ashtamatravibhagam</i>. Meters from each section are explained in detail keeping in mind their character and pattern. This study has clearly explicated the correct pattern to recite the stanzas and has clearly marked the metrical foot.</p>	
Major publication appeared in: Praacheena Kairali, Malayalam Research Journal	
Total no. of pages in the Thesis: 270	
Total no. of reference cited in the thesis: 48	
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Title: “C N SREEKANTAN NAIR’S WOMEN CHARACTERS IN RAMAYANA DRAMAS”	
Researcher : Jaya .J	Guide: Dr. P. Sethunathan
Subject : Malayalam	
<p>The research work is based on the women character described by sri.C.N.Sreekandan Nair on his work on ancient drama based on Ramayana .The Thesis is divided into four chapters.The first chapter describe about the basic history of Malayalam drama.The second chapter describe about a detailed description of C.N.Sreekandan Nair's drama based on Ramayana .C.N.Sreekandan Nair's extra ordinary talent has been mentioned by specially describing drama's such as Lankalekhmi,Saketham,and kanjanaseetha.The third chapter is aimed at introducing women characters in Ramayana Dramas.The fourth chapter is totally devoted to mention about the social transformations brought by Sreekandan Nair through his women characters in his dramas.</p>	
Journal In Which Major Publication Appeared : " Killipattu "	
No. Of Pages : 240	
No. Of References Sited : 66	

Title : “ECOLOGICAL AWARENESS IN THE WORKS OF BASHEER”	
Researcher : Sudina .L .S	Guide : Dr. Sudheendran Pillai
Subject: Malayalam	
<p>The research is a detailed study of ecological awareness in major works of Vaikom Mohammed Basheer. We can find the presence of ecological aspects in his Novels, Short Stories, Autobiography, Correspondence, Articles and Conversations. His style is to approach directly with the ecological sense without considering any rules and regulations in using the language. In his opinion the developments are not amount to destroy our great natural resources and it should be for the development of Nation as well as the Nature. His works teaches us, if we practice non-violence and simple life we should be close to Nature. I found such an Ecological awareness through out his works and it has much importance in this modern life.</p>	
<p>Total No: of pages in the thesis: 240 Total No: of reference: 136 Email of Researcher: sudinasarith@gmail.com</p>	

Title : കുമാരനാശാൻ, ചങ്ങമ്പുഴ, സുഗതകുമാരി എന്നിവരുടെ കവിതകളിലെ വിഷാദാത്മകത - ഒരു താരതമ്യ പഠനം	
Researcher : Dr. Beena Karunakaran	Guide : P. Sethunathan
Subject : Malayalam	
<p>കുമാരനാശാൻ, ചങ്ങമ്പുഴ, സുഗതകുമാരി എന്നീ മൂന്നു കവികളുടെയും ജീവിതദർശനത്തിന്റെ ഭാഗമാണ് വിഷാദാത്മകത. ദുഃഖോപാസകനാണ് ഈ കവികൾ. ലോകവും ജീവിതവും വിഷാദാത്മകമാണെന്ന ചിന്താഗതിയാണ് മൂവർക്കുമുള്ളത്. ദാർശനിക പ്രശ്നങ്ങൾ, ജീവിതദുരന്തങ്ങൾ, വൈയക്തിക പ്രശ്നങ്ങൾ, ലോകത്തിന്റെ ധർമ്മച്യുതി, സാമൂഹികാസമത്വങ്ങൾ എന്നിവയാണ് ഇവരുടെ വിഷാദാത്മകതയുടെ പിന്നിലെ പ്രധാന പ്രശ്നങ്ങൾ. വിഷാദകയത്തിൽ മൂങ്ങുന്ന നിമിഷങ്ങളുണ്ടായിട്ടുണ്ടെങ്കിലും ജീവിതത്തിൽ നിന്ന് പിന്തിരിഞ്ഞു പോകാൻ മൂന്നു കവികളും ശ്രമിച്ചിട്ടില്ല. മാത്രമല്ല മനുഷ്യജീവിതത്തിന്റെ മഹനീയത തിരിച്ചറിഞ്ഞവരാണ് ഈ കവികൾ. വിഷാദാത്മകത ധനാത്മകമായ രീതിയിൽ പരിണമിച്ചതിന്റെ ഫലമായി കവിതകളിലൂടെ പുതിയ വ്യവസ്ഥിതിക്ക് വേണ്ടി വാദിക്കുവാനും മൂവർക്കും സാധിച്ചിട്ടുണ്ട്.</p> <p>കുമാരനാശാന്റെ വിഷാദാത്മകത ദാർശനികമായ പ്രശ്നങ്ങളിൽ നിന്നു ഉത്ഭവിച്ച് സമഷ്ടിയിലേക്ക് പറക്കുക മാത്രമല്ല അവിടെ നിന്ന് സ്നേഹത്തിന്റെയും ശാന്തിയുടെയും തെളിഞ്ഞ അന്തരീക്ഷത്തിലെത്തുകയും ചെയ്തു. മാനവരാശിയുടെ ഉന്നമനത്തിനുള്ള കരുത്തായി കവിയുടെ വിഷാദാത്മകത പരിണമിച്ചിട്ടുണ്ട്. ചങ്ങമ്പുഴയുടെ വിഷാദാത്മകത വൈയക്തികതയിൽ നിന്നും സമഷ്ടിയിലേക്കും സമഷ്ടിയിൽ നിന്ന് വൈയക്തികതയിലേക്കും മാറിക്കൊണ്ടിരിക്കുന്നു. ശാന്തിയുടെ അന്തരീക്ഷമൊന്നും ചങ്ങമ്പുഴക്കവിതയിലില്ല. കവിതകൾ വേദനകളുടെയും ക്ഷോഭങ്ങളുടെയും അവശതയിൽ തന്നെ നിലനിൽക്കുന്നു.</p> <p>വിശാലമായ സ്നേഹസങ്കല്പത്തിലൂടെയും കൃഷ്ണസങ്കല്പത്തിലൂടെയും കവിതകളിൽ ശാന്തസുന്ദരമായ അന്തരീക്ഷം സൃഷ്ടിക്കാൻ സുഗതകുമാരിക്ക് കഴിഞ്ഞിട്ടുണ്ട്. കുമാരനാശാന്റെ വിശാദാത്മകത വൈയക്തികതലം വിട്ട് വിശ്വമാനവിക ദർശനത്തിലേക്കും പ്രപഞ്ചദർശനത്തിലേക്കും സ്നേഹദർശനത്തിലേക്കും ഉയരുന്നു. ചങ്ങമ്പുഴക്കവിതയിലെ വിഷാദാത്മകതക്കു സ്ഥിരമായ സ്വഭാവം ഇല്ലാത്തതിനാൽ ഇത്തരത്തിലുള്ള വികാസം വന്നിട്ടില്ല. എങ്കിലും സമൂഹം, ലോകം, പ്രപഞ്ചം എന്നിങ്ങനെയുള്ള പരിണാമം വന്നുചേർന്നിട്ടുണ്ട്. വൈയക്തികതയിൽ നിന്ന് വിശ്വാതമകതയിലേക്കുള്ള വിഷാദാത്മകതയുടെ വികാസമാണ് കുമാരനാശാന്റെയും സുഗതകുമാരിയുടെയും കവിതകളെ പ്രത്യാശാനിഷ്ഠമാക്കുന്നത്.</p>	

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RESEARCHER : Soni. M.K.	GUIDE : Dr. Valsala Baby
SUBJECT : Malayalam	
<p>നാടോടിവിജ്ഞാനീയത്തിന്റെ മേഖലയിലുള്ള ഒരു പഠനമാണിത്. ഫീൽഡ് വർക്കും നിലവിലുള്ള ഉപാദാനസാമഗ്രികളും ഉപയോഗിച്ചാണ് ഈ പ്രബന്ധം തയ്യാറാക്കിയിരിക്കുന്നത്. നാടോടി വിജ്ഞാനീയത്തിന്റെ ആധുനികമായ പഠനപദ്ധതികളിൽ പ്രധാനപ്പെട്ട വാശീയപഠനത്തെക്കുറിച്ചും കേരളത്തിലെ ആദിവാസി വിഭാഗമായ കാണി ക്കാരെക്കുറിച്ചും അവരുടെ ഉത്സവങ്ങളും വാമൊഴി വഴക്കവുമാണ് ഈ പ്രബന്ധത്തിൽ പ്രതിപാദിക്കുന്നത്. കേരളത്തിലെ ആദിവാസികൾ മറ്റു ഒന്നിലധികം ഭാഗങ്ങളിൽ നിന്നും തികച്ചും വ്യത്യസ്തമായ സാംസ്കാരികതനിമ വെച്ചു പുലർത്തുന്നവരാണ്. അതിലെ ഒരു വർഗ്ഗമായ കാണിക്കാർ കേരളത്തിൽ തിരുവനന്തപുരം, കൊല്ലം ജില്ലകളിലാണ് വസിക്കുന്നത്.</p> <p>കാണിക്കാരുടെ ജീവിതം തനത്ത് പരിഷ്കൃതരൂപത്തിൽ നിന്നു വളരെ വ്യത്യസ്തവും വിശാലവുമായ സാംസ്കാരികതയിലധിഷ്ഠിതമാണ്. ആചാരം, ആരാധന, വിശ്വാസം, കല, ഒന്നിനും മൂതൽ മരണം വരെയുള്ള ക്രിയകൾ തുടങ്ങിയവയിലെല്ലാം സ്വന്തമായി വ്യക്തിത്വമുള്ളവരാണ് കാണിക്കാർ. തിരുവനന്തപുരം, നെയ്യാറ്റിൻകര, പത്തനാപുരം എന്നീ താലൂക്കുകളിലെ 233 കാണി സെറ്റിൽമെന്റുകളിലാണ് ഇവർ വസിക്കുന്നത്. കാണി എന്ന വാക്കിന് കണികൊടി വരുന്നവൻ, അധിപൻ, വഴികാട്ടിക്കൊടുക്കുന്നവൻ എന്നെല്ലാം അർത്ഥമുണ്ട്. സംഘം ചേർന്നുള്ള ജീവിത രീതിയാണ് ഇവർ നയിക്കുന്നത്. പത്തോ, ഇരുപതോ കാണിക്കുടികൾ ഒരു പ്രദേശത്ത് ഉള്ളതിനെ കാണിപ്പറ്റ് എന്നു വിളിക്കുന്നു. കാണിത്തലവനായ പ്ലാത്തിയുടെ നേതൃത്വത്തിൽ കാടുമായി ഇണങ്ങിക്കഴിയുന്ന ജീവിതരീതിയാണ് ഇവർക്കുള്ളത്. കാണിക്കാരുടെ ജീവിതത്തിൽ പ്രഥമസ്ഥാനം ദൈവത്തിനാണ്. വേട്ടയാടിയോ കൃഷി ചെയ്തോ കിട്ടുന്നതെന്തും ആദ്യം നൽകുന്നത് ദേവത്തിനാണ്. ജീവിതത്തിന്റെ വിലയൊരളവ് ദൈവപുജയ്ക്കും അധാനത്തിനുമായി മാറ്റിവയ്ക്കുന്നു. കൃഷിപ്പണി നടത്തുന്നതിന് മുമ്പ് പ്ലാത്തി യുടേയോ മുട്ടുകാണിയുടേയോ നേതൃത്വത്തിൽ പുലകൾ നടത്തുന്നു. ദേഹരക്ഷയ്ക്കും പരേതന്മാക്കളെ പ്രീതിപ്പെടുത്തുവാനും ദുർമൂർത്തികളെയും സത്മൂർത്തികളെയും ഇവർ ആരാധിക്കുന്നു. സൂര്യൻ, ചന്ദ്രൻ, വൃക്ഷം, സർപ്പം, ചാവുകൾ, മുത്തൻ, മുത്തി തുടങ്ങി നിരവധി മൂർത്തികൾ കാണിക്കാർക്കിടയിലുണ്ട്. ഇവരെ സന്തോഷിപ്പിക്കുവാനും പ്രീതിപ്പെടുത്തുവാനുമായി വിവിധതരം ചാറ്റുപാട്ടുകളും കൊടുതികളും നടത്തുന്നു. കാണിക്കാരുടെ ജീവിതാനുഭവങ്ങളിൽ നിന്നും നിരീക്ഷണങ്ങളിൽ നിന്നും രൂപപ്പെട്ടവയാണ് അവരുടെ കഥകൾ, കടങ്കഥകൾ, ചികിത്സ, പാട്ടുകൾ, സൂത്രലിപി, കലാരൂപങ്ങൾ എന്നിവ കാലാട്ടം, മുരുകടികളി, കമ്പടവ്കളി എന്നിവ ഇന്നും കാണിക്കാർക്കിടയിൽ ഉത്സവത്തോടനുബന്ധിച്ചും വിശേഷ അവസരങ്ങളിലും നടത്തുന്ന കലാരൂപങ്ങളാണ്. ഇവർക്കിടയിൽ കാണപ്പെടുന്ന ലിപി വ്യവസ്ഥയാണ് സൂത്രലിപി. വാമൊഴിയായി നിൽക്കുന്ന ചാറ്റുപാട്ടുകൾ, മലമ്പാട്ട്, വാതപ്പാട്ട്, മന്ത്രവാദപ്പാട്ടുകൾ എന്നിവ ഇന്നും കാണിക്കാരുടെ സാംസ്കാരിക തനിമ നിലനിർത്തുന്നവയാണ്. കാടിന്റെ തനിമയും നാഗരിക ജീവിതത്തിന്റെ കടന്നു കയറ്റവും കാണിക്കാർക്കിടയിൽ ധാരാളം പരിവർത്തനങ്ങൾ വരുത്തി. എന്നിരുന്നാലും ഇന്നും അവർ തങ്ങളുടെ ഗോത്രത്തിന്മേലുള്ള കാത്തുസൂക്ഷിക്കുവാൻ ശ്രമിക്കുന്നു.</p>	

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RESEARCHER: Sreedevi .S	Guide Dr. D Benjamin
Subject : Malayalam	
<p>ഈ പ്രബന്ധത്തിൽ സി.വി. ശ്രീരാമന്റെ കഥകളെ അവയിലെ പ്രമേയങ്ങളെയും രചനാശില്പത്തെയും ആസ്പദമാക്കി പഠിച്ചിരിക്കുന്നു. സി.വി.ശ്രീരാമനെ ആകർഷിച്ച ജീവിതസമസ്യകൾ എന്തൊക്കെയാണ്, അവയിൽ നിന്ന് അദ്ദേഹം എന്തൊക്കെ പ്രമേയങ്ങൾ കെട്ടിത്തൂങ്ങുന്നു, ഈ പ്രമേയങ്ങളെ എങ്ങനെയാണ് പഠിച്ചിരിക്കുന്നത്, ഒരാഖ്യാനരൂപം എന്ന നിലയ്ക്ക് അദ്ദേഹത്തിന്റെ കഥകളിലെ ശില്പവിധാനം എന്താണ്, ഈ കാര്യങ്ങളാണ് പ്രധാനമായും അന്വേഷിക്കുന്നത്. കഥകളുടെ വിശകലനത്തിനായി കലാതത്വങ്ങൾ, ഉത്തരാധുനിക സിദ്ധാന്തങ്ങൾ എന്നിവ ഉപയുക്തമാക്കിയിരിക്കുന്നു. ഓരോ വിഷയത്തെയും എഴുത്തുകാരൻ കാണുന്നത് തനതായ കാഴ്ചപ്പാടിലായിരിക്കും അതിൽ വിഷയത്തിന്റെ ഏതെങ്കിലും ഒരു ഘടകമാകും പ്രാമുഖ്യം നേടുക. അങ്ങനെ ഒരു വിഷയത്തിൽ നിന്നും എഴുത്തുകാരന്റെ ഉൾക്കാഴ്ച തിരിച്ചറിയുന്ന ആന്തരിക സത്തയാണ് പ്രമേയം. എഴുത്തുകാരനെ സംബന്ധിച്ച് വിഷയങ്ങൾക്കാണ് പ്രമേയങ്ങൾക്കല്ല പരിമിതിയുള്ളത്. ഒരേ വിഷയത്തെ ഒട്ടേറെ പരിപ്രേക്ഷ്യങ്ങളിൽ കാണാം. കാഴ്ചപ്പാടുകൾ മാറുന്നത് അനുസരിച്ച് ഒരേ വിഷയത്തിൽ നിന്നുതന്നെ അനേകം പ്രമേയങ്ങൾ ഉരുത്തിരിയുകയും ചെയ്യും അതിനാൽ പ്രമേയങ്ങൾ അനന്തമാണ് എന്ന നിലപാടിൽ നിന്ന് കൊണ്ട് സ്ഥൂലവിഷയങ്ങൾ സ്വകീയമായ കാഴ്ചപ്പാടിൽ എങ്ങനെ സൂക്ഷ്മമായ പ്രമേയങ്ങളായി രൂപാന്തരപ്പെടുന്നു, ഒരേ വിഷയത്തിൽ നിന്ന് എന്തൊക്കെ പ്രമേയങ്ങൾ ശ്രീരാമൻ കെട്ടിത്തൂങ്ങുന്നു എന്നതിനാണ് പ്രാധാന്യം നൽകിയിരിക്കുന്നത്. ചെറുകഥ വാക്കുകൾക്കൊപ്പമുള്ള ആഖ്യാനമായതിനാൽ ആഖ്യാനശാസ്ത്രത്തിന്റെ ഉപദർശനങ്ങളെ മുഖ്യ അവലംബമാക്കി ചെറുകഥയുടെ ശില്പം അനാവരണം ചെയ്യുന്നുമുണ്ട്.</p>	

Major Publication appeared in : Malayala Sahithi

Total no of pages in the thesis: 287 Total no of reference cited in the thesis: 194

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Stream: Arts and Humanities

Subject: *Music*

Title : “Intellectual and Creative Contributions of the Geniuses of Mṛdangam in the 20th Century”

Researcher : Aneesh Kumar .K

Guide : Dr. B. Arundhathi

Subject : Muisce

The Mṛdangam playing has developed towards perfection in progressive stages. Over the years this progress has developed in to two distinct schools of Mṛdangam playing, the Thanjavur Bāni and the Pudukkottai Bāni. The Thanjavur Bāni has evolved from the Maharashtrian style of accompanying for the Harikatha and Nāma Sankeerthanam. The great and unchallengeable doyen of the times Narayana Swami Appa perfected this style and made it popular. This style concentrated and closely accompanied the Sāhithya while strictly observing the nuances of the tāla varieties. Thanjavur Vaidyanatha Iyer, followed this style strictly and perfected it further to become the accompanying style for a carnatic classical concert. His great disciple Palghat Mani Iyer along with his disciples has been the most important torch bearers of this style of playing. The Pudukkottai Bāni originates in the genius of tāla expertise Manpoondiya Pillai – Mamundiya Pillai. His inherent love for tāla made him excel in Thavil playing and his expertise was so unique that he was able to adapt the nuances of Thavil playing on his single handed membrane drum, the Duff. Inspired by his guru and his own love for the Duff he remodelled the Duff with great perseverance into a single handed vādya the Kanjeera. This vādya grew to perfection in the hands of Mamundya Pillai and his great disciples Andavan Dakshinamurthy Pillai and Pazhani Muthiah Pillai. Their style concentrated mostly on the permutations and combinations of laya – tāla verities which had been never before heard of. In conclusion the future of the Mṛdangam in global music has been explored. And also the eternal nature of the Mṛdangam has proved to be safe and is assured of a bright future in the hands of the young and innovative artists. The additions made by the innovative and imaginative stalwarts have gone into the Sampradya and have become one with the Sampradya, accepted by all intelligent percussionists because this means growing into perfection.

Major publication appeared in : Samakalila Sangeetham, Vol.4

Total no. of pages in the thesis : 375

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Title: “THE ROLE OF MUSIC IN THE TEMPLES OF NORTHERN KERALA”	
Researcher: Mahitha Varma	Guide: Dr. S. Bhagya Lekshmy
Subject: Music	
<p>Kerala is a land of Temples. Temples are abundant with rituals. Each and every ritual whether it is daily, monthly or annual is accompanied with music and musical instruments. The current study focuses mainly on various kinds of rituals and its music, especially in the temples of northern Part of Kerala. Some musical forms like Tyani, Paani, Idakka Pradakshinam, Kriyanga Panchavadyam are done as an accompaniment to the daily poojas of a temple. While other categories like Kalampattu, Bhagavathy Pattu, Theeyattu Pattu and Brahmani Pattu are done for special occasions in a temple and houses. A detailed study of indigenous Kerala instruments have done in the thesis. Certain ragas and lakshanas of such ragas which belongs only to Kerala are given in the study. Opinions of great temple musicians who have constantly contributed to the temple music field also have been given in this study. The main objective of this study is to preserve our rich temple music tradition which gradually going into oblivion.</p>	
Key words: Kottippadi seva, Tyani, Kalamezhuthu Pattu.	
Major publication appeared in: Shanmukha- A journal published by Shanmukhananda Sabha, Mumbai.	
Total number of pages in the thesis: 156	
Total number of reference cited in the thesis: 24	
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Title : “COMPOSITIONS OF TRINITY IN MADHYAMA VARJYA RAGAS”	
Researcher: Saraswathy Sreedhar	Guide : Dr. B. Pushpa
Subject : Music (Vocal)	
<p>India’s vast tradition of music, art and literature can be perceived from time immemorial. It was during the period of Sama Veda that music came to assume great significance. The outstanding features of Carnatic music is the raga system. The classification of ragas into Janaka and Janya is the most significant system of raga classification. There are 72 Janaka ragas based on the twelve main svarasthanas of the sthayi, whereas the number of Janya ragas is practically unlimited. Among the Janya ragas, the varjya ragas are the ragas in which one or two notes are varjya or absent. Bhupalam, Mohanam, Revagupti, Hamsadhvani, Bauli, Valachi, Kalgada etc. are some of the best examples of the Madhyama Varjya ragas. The note Madhyama is like the fulcrum amongst the saptasvaras. It is the central pivotal note, with three notes (s,r,g) below and three notes (p,d,n) above. Thus it is in a position to control and influence the colouring, resulting from the change of suddhamadhyama to pratimadhyama. But even with the absence of the note ‘M’ the individuality of the ragas can be brought out and they can shine well through the various musical forms. This is established through this study. The Madhyama varjya raga can be Shadava-Shadava, Audava-Audava and Audava-Shadava of regular or vakra type. The musical Trinity has contributed a number of musical compositions with their own styles. The aim of the study was to collect and learn the popular and unknown Madhyama varjya raga compositions. There are many kritis in these ragas and they are also very popular and used in concerts. The analysis of these madhyama varjya raga compositions helped to understand the raga lakshana, their rare and popular prayogas, their possibilities, ragabhava etc. By doing this work it is evident that Tyagaraja has 19 number of madhyama varjya raga kritis, Muthusvami Dikshitar has 14 number of madhyama varjya raga kritis and Syama Sastri has only one kriti in the raga Kalgada a rare and unpopular raga. Even though there are other madhyama varjya compositions of various composers are available, this study is based on the compositions of Trinity only.</p>	
<p>Major publication appeared in. Kilippattu Total No of pages in the thesis: 231 Total No of reference cited in the thesis: 102 Email of Researcher: saraswathy.sreedhar85@gmail.com</p>	

Title: “A Study of the Angas Madhyamakala Sahithya and Solkattu in various Sanskrit compositions”

Researcher: Sridevi .N

Guide: Dr. B. Pushpa

Subject: Music

This particular thesis is an attempt to study and analyze the decorative angas Madhyamakala Sahithya and Solkattu, figuring in the musical compositions (Sanskrit) of various composers from Pre-Trinity period to the Modern period. This research work also delves into the usage of literary beauties such as Prasa, Yati and Yamaka, which are found in the sahithya of the compositions. The succession of composers and musicians were the authors and interpreters of a variety of musical forms. The musical imagination of our great composers of the pre-trinity period, the trinity period and the post- trinity period gave way to an extensive variety of musical forms such as *Slokas, Gitas, Varnas, Bhajans, Kirtanas, Kritis, Jawalis, Padas, Tillanas* etc. composed in different languages, talas and ragas. The studies of these musical forms in their technical, historical and developmental aspects are hence, indispensable. Prabandhas with six Angas and four Dhatus form the source of many compositions. It is the Kirtana that has formed the base for the development of ‘Kriti’ compositions. In Kritis and Kirtanas, one can come across many beautiful *decorative angas* which not only adorn these pieces but also enhance the musical quality and literary excellence. They are introduced in the Kritis in addition to the essential angas Pallavi, Anupallavi and Charana. A detailed study of prabandhas, its constituent angas and its structure and development as well as the study of the musical forms Kirtana and Kriti in their technical, historical and utilitarian aspects is carried out. A study regarding the embellishments like Sangathis, Chittaswara, Solkattu, Madhyamakala Sahitya etc. which are used to enrich the melodic aspects in kritis ,the various aspects of the anga Madhyamakala Sahitya and the origin, growth and developmental aspects of the different Solkattu patterns are dealt with. An analysis of kritis of different composers has been done to bring out the literal beauties and embellishments present in various compositions. It has come to notice that out of the six decorative angas Madhyamakala Sahitya is widely employed by almost all the composers, ancient or modern, than the Solkattu patterns. Thus, they are in certain ways inter-related.

Keywords: Prabandhas, Musical Forms, Kriti and Kirtanas, Decorative Angas, Madhyamakala Sahithya, Solkattu

Major Publications appeared in: VijnanaKairali, Kerala bhasha Institute, Volume 45, February 2014. Nadamritham, The Journal of Music, Dept. of music, University of Kerala, Volume 2, December 2006.

Total number of pages: 275

Total No. of reference cited in the thesis: 165

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Title: “A Study on bowed instruments with special reference to Violin and Viola”	
Researcher: Vrinda Varma .E	Guide: Dr. G. Sreelatha
Subject: Music	
<p>This research is a study on bowed instruments with special reference to Violin and Viola. Violin is widely accepted and integral part of concert both as a solo and accompaniment, due to its capacity to match the Vocal music and all the sounds (nuances) made by the voice. Considering the difficulty in playing Viola, it has been less introduced in Indian concerts. A study is taken up here to prove Viola also as an accompanying instrument to vocal and as a solo instrument. Following are my contributions: When Violin and Viola are tuned in the same pitch; the Violin’s tone will be sharp and Viola’s tone will be bass, like a male - female voice. Here Viola can be used as a base instrument for a Violin-Viola concert and it gives a good aesthetic effect. Viola is heard as a drone while being played at manthrastayi. For example in a flute concert, the artists uses the base flute, after concluding the raga alapana in the normal pitch of the flute. One of the possibilities of Viola in Carnatic music is proved practically by creating melodic effect in Violin-Viola concert. This study gives awareness about the importance of these two instruments, especially Viola as a concert instrument and highlights the differences between Violin and Viola.</p>	
<p>Major Publication appeared in: <i>Vijnana Kairali</i> Total No: of pages in the thesis: 315 Total No. of reference cited in the thesis: 82 Email of Researcher: varmavrinda@gmail.com</p>	

Stream: Arts and Humanities

Subject: Sanskrit

Title: “PRABHA AND DINAKARI - A COMPARATIVE STUDY WITH REFERENCE TO SABDAKHANDA”	
Researcher: Ajimon .C .S	Guide: Dr. K. Chandrasekharan Nair
Subject: Sanskrit	
<p>The research is a comparative analysis of the two great works on Nyaya Sastra viz. Prabha and Dinakari (Nyaya is one of the Indian philosophies.) . The research is done with reference to ‘Sabdakhanda’ i.e one of the chapters of these two works. The subject matter of this particular chapter is the theories on verbal knowledge. The two works have examined the Nyaya view of verbal knowledge deeply. The research work is mainly focused on the areas like – what is verbal knowledge, which are the main process of verbal knowledge, what is word, the different types of words, the ways to understanding the meanings of the words, what is sentence, how the meaning of sentence is acquired, what are the causes of verbal knowledge and the meaning of the compound word etc. The research work puts forth the Nyaya philosophy of language. Knowledge of these theories will be very much helpful for the proper understanding of the modern linguistics. There remain more chances to make comparative study of the ancient and modern concepts on Verbal knowledge.</p>	
Major Publication appeared in: Poornatrayi Total No. of pages in the thesis: 292 Total No. Of reference cited in the thesis: 77 Email of Researcher: csajimon@gmail.com	

Title: “Upikhyinas in the UpaniAads- A Study”	
Researcher: Anand .S	Guide: Dr. T. Devarajan
Subject: Sanskrit	
<p>Summary: The thesis is a descriptive study of the narrative stories and dialogues seen in the one hundred and eight UpaniAads as enlisted in the MuktikopaniAad. An analytical method of research has been followed here to explain the symbolisms and characters that are knitted within the stories. Upikhyanas are analysed on the basis of verses from Major Upanishads, Bhagavad Gita and ideas propagated by commentators like Adi Shankaracharya, Mahvacharya, Ramanujacharya. The origin of Indian narrative literature has been traced to the Vedic period where various types of Indian tales existed and these stories were used for a specific purpose i.e. for inculcating useful knowledge. It is noted that all the symbolisms seen in upikhyinas point towards the universal forces and which, at last, culminate on the eternal consciousness, Brahman. They also reveal the teaching methodology of Vedic age. It is concluded that the ultimate aim of upikhyinas is to show that the goal of human life should be realization of eternal truth which is beyond any limitations. The aim of performance of upisanas by every human should be towards the achievement of this eternity so that he can escape from the cycle of death and birth, which is emancipation in its full sense.</p>	
<p>Major publication appeared in: Journal of Sukritindra Oriental Research Institute Total number of pages in the thesis: 266 Total number of reference cited in the thesis: 111 Email of Researcher: anandpillai108@gmail.com</p>	

Title: “Prakarana works of Sankaracarya with Special Reference to Tattva bodha”	
Researcher : Lalithamma .T	Guide: Dr. S. Devaki Antharjanam
Subject : Sanskrit	
<p>Sri Sankara was the most able and well known advocate of advita Vedanta. The depth of the Philosophical thinking contained in the works of sankara is beyond the reach of the ordinary people. So, in order to serve the needs of the seeker of knowledge at different levels of intellectual understanding he wrote a number of books. These are called Prakaranas. Tattva bodha on which emphasis is given in the present study is a prakarana grandha written by Sankaracarya in a prose form. This text introduces the seeker to the technical terms used in Advaita. Sankara’s method of presentation, especially in the present work is exemplary. Sankara has utilized his expertise in presenting the Advaita Vedantic material in the present work. The abstruse and abstract tenets of Advaita Vedanta have been prescribed here in so simple a manner that every student can easily understand the same. The present study closely examines the entire text and enumerates the Principal concepts of Advaita In fact, Tattava bodha or knowledge of Atman is the summum bonum of Advaita Vedanta.</p>	
Key words: Sankaracarya, Prakaranas, Tattva bodha, Advaita Vedanta	
Published work : Nil	
Total No of pages in this thesis : 309	
Total No of reference cited in the thesis : 105	
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Title: “AUCITYA IN THE MAHĒBHĒRATA PLAYS OF BHASA”

Researcher : Renjith Rajan

Guide: Dr. P.K. Thankamoni

Subject: Sanskrit

This research work is an analysis of the six Bhasa plays based on the *Mahjbhjrata viz., Madhyamavyjyoga, Paucarjitra, Kar,abhjra, D<tagha¶otkaca and Írubha´ga* for the places of propriety. As per the guidelines of the University one has to finish his research in a stipulated time of five years and the evaluation of thirteen dramas of Bhasa, in the light of the theory of Kshemendra, demands more time. Hence I am constrained to limit the study on the *Mahjbhjrata* plays of Bhasa. Among the quotations made by Kshemendra, the master of *Aucitya* theory, we cannot come across even a single passage belongs to Bhasa. In *Aucityavicjracarcj* Kshemendra considers *aucitya* as the soul of poetry. He names twenty seven *aucityasthjna-s* such as *pada, vjkya, prabandha, gu,a, ala´kja, rasa, kriyj, kjraka, li´ga, vacana, vijeÀa, a upasarga, nipjta, kjla, deja, kula, vrata, tattva, sattva, abhiprjya, svabhjva, sjrasa´graha, pratibhj, avasthj, vicjra, njma and jçirvjdá*. Several instances for them can be cited from the plays to illustrate propriety or impropriety as mentioned by Kshemendra. Among the places of propriety to assess all types of *Kjvya-s* including dramas, the fourteen are occur in the *Mahjbhjrata* plays. They are *pada, vjkya, prabandhjrtha, gu,a, ala´kja, rasa* along with *rasasa´kara, kriyjpada, nipjta, kjla, kula, tattva, sjrasamgraha, njma* and *jçervacana*. Eventhough along with the *aucitya-s* some feeble *anaucitya-s* also occur in the plays, those are lost in a lot of virtues of *aucitya-s* like the black spots on the moon lost in its rays.

Keywords: *Aucitya, Anaucitya, Mahjbhjrata* plays, places of propriety, Kshemendra, Bhasa.

Major publication appeared in: Journal of Sukrt&ndra Oriental Research Institute,
Total No. of pages in the thesis: 233
Total No. of reference cited in the thesis: 425
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Title : “COSMOLOGY : A COMPARATIVE STUDY ASED ON VISNUPURANA AND SANKHYA”	
Researcher : Retheesh .K	Guide: Dr. Syamaladevi .P
Subject : Sanskrit	
<p>This research is a comparative analysis of the cosmological elements discussed both in Visnupurana and Sankhyakarika. The work concentrates on the comparative elements related to the creation of the Universe, the causes behind the process of formation of the Universe and the condition before the creation. Sankhyakarika, being the oldest authoritative work now available on Sankhya Philosophy describes the cosmological aspects which is a synthesis of the views of Sankhya, Advaita, Vaishnavism etc. As such a comparative study is rare in Sanskrit till date, this study is relevant. After a detailed analysis of the matters discussed in both the texts related to the origin of the Universe, I separately listed the similarities and dissimilarities. Following are my findings. Creation of the Universe, according to Visnupurana, is a periodical and cyclic process. It is not an accidental event, but an evolutionary cyclic process. Sankhyakarika establish the concept of Satkaryavada in order to explain the origin of the Universe. According to Sankhyakarika, creation is the evolution from the unmanifest to the manifest. The most important point of difference between the texts is that the Purana recognises the place of God as the creator of the Universe. But Sankhyakarika does not accommodate this view and admits the conjunction of Purusa and Prakrti as the cause of the creation. Visnupurana depicts Visnu as the Supreme Reality. He is infinite, absolute, eternal, attributeless and pure consciousness. According to Sankhyakarika, Purusa is also described as eternal separate and real entity. The evolution theories discusses in both the texts show very close similarity . The comparative investigation carried out in the study shows the influence of the cosmological concepts of Sankhya over that of Visnupurana.</p>	
Key words: Cosmology, Universe, Sankhya, Visnupurana, Purusa, Prakati	
Total No. of pages in the thesis : 276	
Total No. of reference cited in the thesis: 396	
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Stream: Arts and Humanities

Subject: *Tamil*

Title : “A Critical Study of Vezheventhan’s Poem’s”	
Researcher : AnI .J .R	Guide : Dr. M. Nainar
Subject : Tamil	
<p>This study is an indepth exploration of the Tamil poet vezheventhan’s insight into the Tamil society in the second half of the twentieth century. It attempts to juxtapose the socio - political atmosphere prevailed in the society during the poet’s life time and the unorthodox subject matters deliberated in the poems. In that way, the study vividly establishes the impact of the political developments in the poems of vezheventhan. The significance of vezheventhan’s poems, as the study reveals is that the modern attitudes of the tamil society is presented in the traditional Tamil Poetic Form. In this way, Vezheventhan has contributed towards the refinement of the existing order, paving a way for the emergence of a new social order. Thus, the study is socially relevant and contributes a little more to the existing knowledge. Vezheventhan is established as one of the greatest poets of the twentieth century. He is a great artefactor with spontaneous imagination and a fine sense for aesthetics. He is versatile in using the techniques of traditional poetic forms like similie, metaphor etc. with great finesse. His poetry is an embodiment of noble thoughts, magnificent imagination and perfect passion. He shows an innate capacity to use apt words to express his ideas with force and clarity. Even the hard words he use attain lucidity because of the musicality of the poems. These qualities of Vezheventhan are elucidated from his poems by the researcher. Besides that, the study focuses on how Vezheventhan has been inspired and influenced by the Dravidian movement and the leaders of the movement like Annadurai, Karunanidhi etc. Vezheventhan is rightly projected in the study as a poet aspiring for radical and social charges. His approach to remove the evils and social ills responsible for the demoralization of the society and the desire to change the outdated laws that abet and support discrimination in the name of caste and creed are effectively highlighted in the study. Further, the study points out that Vezheventhan’s expressed desire through his poetry is to promote rational humanism and abolish all the social evils. Thus, the study proves to be beacon for those who walk the way to effect changes and bring peace and happiness.</p>	
<p>Keywords : Vezheventan’s insight, Modern attitudes, Traditional Poetic Forms, Rational humanism, New social order</p>	
<p>Major Publication Appeared in: International Conference on Dimensions of Tamilology Total no. of pages in the thesis : 333 Total no. of reference cited in the thesis : 58 Email of Researcher : anijr1982@yahoo.com</p>	

Title : “PROVERBS OF COIMBATORE AND PALAKKAD DISTRICTS – A COMPARATIVE STUDY”	
Researcher: Sabeela .I	Guide: Dr. T. Vijayalakshmi
Subject: Tamil	
<p>‘Folklore’ means the lore of the people which was known as ‘popular antiquities’. Folklore is that of tradition something handed down from one person to another and preserved either by memory or practice rather than written record. Folklore consist of legends, music, oral history, proverbs, jokes, popular beliefs, fairy tales, stories, Ballads and customs included in the traditional of a culture, sub culture or group. It also includes the set of practices through which those expressive genres are shared. Proverb is one of the genres of Folklore. It is a short, generally known sentence of the folk which contains wisdom, truth, morals, and traditional views in a metaphorical, fixed and memorisable form and which is handed down from generation to generation. Collecting proverbs from languages where they have not been documented is valuable for a variety of people. Some proverbs are collected and published on books and many of them are not. It is very important to bring the details of those collected proverbs to this world. It will help to analysis the culture and tradition of the people, lived during that period. A serious and systematic study of the proverbs will also help to reconstruct the social history. And present study will attend a serious compilation of proverbs not recorded and root out in book form. Even as the comparative study highlight the entire socio cultural and religious, Philosophic life system of the people concern. The basic purpose of the present study is to collect and compile and compare the proverbs of the two districts with the view to meaningfully brings out the cultural transmission of this two culture. The ‘proverb’ deals with the origin, growth, style, classification of the proverbs. The project also explain the structure of Tamil and Malayalam proverbs, usage of proverbs in the present age, their grammar in a detailed manner. ‘Social elements in Coimbatore and Palakkad district proverbs’ includes Tamil proverbs in the Coimbatore district and Malayalam Tamil proverbs in the Palakkad district, which was divided in five heading. The project concluding with the cultural transmission of this two different culture .</p>	
Keywords : Folklore, Proverbs, Structure, Caparison, social Elements, Cultural Transmission	
Major Publication appeared in : International Seminar of All India University , Tamil Teachers Association , Kamaraj University Madurai .	
Total number of pages in the thesis : 484	
Total number of Reference cited in the thesis : 66	
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Stream: Arts and Humanities

Subject: *Hindi*

Title: “Social Consciousness in the Stories of Midhileswar. (Midhileswar ki khaniyom mein Samajik Chetna)”	
Researcher: Mayalekshmi .V	Guide: Dr. Leelakumari Amma
Subject: Hindi Literature	
<p>This research work is a detailed analysis of the Social Consciousness in the Middle Class society in connection with the stories of Midhileswar. In Midhileswar, Social Consciousness is an effort to instill awareness into society against Superstitious beliefs, corruptions and unlawfulness. His stories depict the true life of rural life with all its variety and complexity. Midhileswar his grievances against one of the striking social problems, ie, unemployment, especially of the educated people. His stories also reflects the exploitation falls on the down-trodden—farm laborers, shepherds and people belongs to Socially and educationally backward classes. Women problems are also expressed. The women among the rural life suffer mostly as they live at the mercy of a male-dominated society. The writer not only depicts the rural life, but the urban life also. In short, Midhileswar through his writings takes an ideal step to change the face of the society.</p>	
<p>Major publication appeared in: Total number of pages in the thesis: 276 Total number of reference is cited in the thesis: 68 Email of Researcher: vmayalekshmi@gmail.com</p>	

TITLE : KERAL KI HINDI KAVITHA SAMVEDANA AUR SHILP

RESEARCHER : ASHA DEVI M S

GUIDE : DR. J UMAKUMARY

SUBJECT : HINDI

भारतीय भाषाओं में विशिष्ट स्थान प्राप्त हिन्दी आज केवल हिन्दी-प्रदेश की ही भाषा नहीं, पूरे देश की भाषा है। हिन्दी भाषा और साहित्य की संवृद्धि में हिन्दी भाषी लोगों के साथ-साथ हिन्दीतर प्रदेशों के विभिन्न साहित्यकारों, लेखकों व राष्ट्रीय नेताओं का बड़ा योगदान है। हिन्दी काव्य जगत को संपन्न व सशक्त बनाने में हिन्दी क्षेत्र से सुदूर दक्षिण में स्थित केरल के अनेक कवि-महाकवियों ने सराहनीय कार्य किया है। आज भी हिन्दी काव्य-सृजन के क्षेत्र में केरल के हिन्दी प्रेमी कवि अपनी-अपनी सशक्त भूमिकाएँ दर्ज कर रहे हैं। समय-समय पर उनकी मौलिक रचनाएँ संकलन रूप में तथा पत्र-पत्रिकाओं में प्रकाशित होती रहती हैं। उन्नीसवीं शती में गेय पदों से प्रारंभित केरल की हिन्दी काव्य यात्रा बीसवीं शती के पूर्वार्द्ध में राष्ट्रीय जागरण से ओतप्रोत होकर आज विषय विविधता को स्वीकारती हुई आगे बढ़ रही है। हिन्दी में उच्चस्तरीय रचनाओं का प्रणयन होने पर भी यहाँ रचित रचनाओं का उचित मूल्यांकन अब तक नहीं हुआ है। अतः प्रस्तुत अध्ययन में केरल के हिन्दी कवियों की काव्य साधना को सशक्त अभिव्यक्ति देने का सफल प्रयास किया गया है। केरल में प्रकाशित हिन्दी कविताओं में संवेदनाओं की अनेकरूपता दिखाई पड़ती है जो मानव जीवन का यथार्थ चित्र प्रस्तुत करता है। कविताओं में सामाजिक, राजनीतिक, आर्थिक, नैतिक, धार्मिक, सांस्कृतिक, मानवीय व नारी संवेदनाओं के साथ राष्ट्रप्रेम, राष्ट्रभाषा प्रेम, विशिष्ट पुरुषों के प्रति आदर भाव, प्रकृति प्रेम तथा पारिस्थितिक बोध, साहित्य एवं साहित्यकारों के प्रति संवेदना जैसी अनुभूतियों को भी अभिव्यक्ति दी गयी है। मानवतावाद, साम्यवाद जैसे वादों का समावेश भी कविताओं में पाया जाता है। इस प्रकार मानव जीवन के विभिन्न पहलुओं को यथा तथ्य चित्रित करने के साथ-साथ विषयानुसार काल्पनिकता का समावेश भी कविताओं को रोचक बना देते हैं। प्रसंग व पात्रानुकूल भाषा, कथ्य के अनुकूल विभिन्न शैलियों का प्रयोग, सशक्त और भाषा के स्पष्टीकरण में सफल प्रतीकात्मकता, सार्थक बिम्बयोजना, शब्दालंकारों और अर्थालंकारों का समावेश आदि काव्य को स्वाभाविकता व आलंकारिकता प्रदान करते हैं। केरल के काव्यों की शिल्प संरचना संवेदना के अनुकूल सुगठित एवं प्रभावोत्पादक है। संवेदना और शिल्प की दृष्टि से सशक्त होने पर भी हिन्दी साहित्य के इतिहास में केरल के कवि व रचनाओं को उचित स्थान अप्राप्त है। केरल के हिन्दी कवियों को पूरे भारत में मान्यता तभी मिल सकती है जब समीक्षकों व साहित्येतिहासकारों द्वारा इस ओर ध्यान केन्द्रित हों। मेरा शोध प्रबन्ध इसके लिए सहायक होगा यही कामना है।

Major publication appeared in : SANGRADHAN(HINDI VIDYAPEET) AND KERAL JYOTHI (KERAL HINDI PRACHARSABHA)

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Title : Trilochan Shastri Ke Kavyom Mem Jana Chethana
Researcher : Deepalekshmi. V. K.
Subject : Hindi

Guide : Mr. M.A. Karim

‘जनचेतना’ शब्द का मतलब होता है-‘जन जागरण’। जनचेतना का मूल स्रोत जन-मन है। विश्व महायुद्धों के दौरान समाज-सुधारकों-लेखकों का यह दृष्टसंकल्प रहा है कि जन-साधारण में बदलाव की तीखी इच्छा पैदा करना अति आवश्यक है। प्रगति-सिद्धांतों के अनुयायी त्रिलोचन शास्त्री ने अपनी रचनाओं- ‘घरती’, ‘गुलाब और बुलबुल’, ‘दिगन्त’, ‘ताप के ताए हुए दिन’, ‘शब्द’, ‘अरघान’, ‘उस जनपद का कवि हूँ’, ‘तुम्हें सौंपता हूँ’, ‘फूल नाम है एक’, ‘अनकहनी भी कुछ कहनी है’, ‘सबका अपना आकाश’ आदि सारी रचनाओं में काव्य-संवेतना की अत्यंत ठोस अभिव्यक्ति है। भारतीय परंपरा के प्रति श्रद्धा भरी दृष्टिकोण, भारतीय सभ्यता, सुखकामी लोगों की स्वार्थता, आम जनता की दुर्दशा, जिंदगी की वास्तविकता, राष्ट्रीय एकता, धर्म निरपेक्षता, समता बोध, संगठन की चेतावनी, जीवन मूल्यों का उल्लेख आदि कई स्तरों में नवीन विचारों का बीज है।

Major Publication appeared in संकलन, केरल ज्योति

Total No. of Pages in the thesis : 275 Total No. of reference cited in the thesis-161

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TITLE : ASSIYOTTAR HINDI LEKHIKAON KE UPANYASOM MEIN YUGBODH

RESEARCHER : DHANYA STEPHEN

GUIDE : DR. J UMAKUMARY

SUBJECT : HINDI

प्रत्येक युग का साहित्य अपने समय का परिचायक रहता है। साहित्य का युगीन होना ही उसकी अर्थवत्ता का द्योतक है। साहित्य के अन्तर्गत युग शब्द को काल विशेष के रूप में प्रयुक्त किया जाता है और बोध शब्द को प्रत्यक्ष ज्ञान या जानकारी के रूप में। युग बोध का सरल अर्थ है - काल विशेष की परिस्थितियों का ज्ञान। हर युग के साहित्य में युग बोध अपना प्रभाव छोड़ जाता है और हर युग की अपनी सामाजिक, राजनीतिक, आर्थिक, धार्मिक, सांस्कृतिक तथा नैतिक परिस्थितियाँ युग बोध को ही प्रस्तुत करती हैं। अतः साहित्य में निहित युग बोध की अनिवार्यता को देखते हुए ही मैं ने स्त्री अस्मिता और स्वातंत्र्य के समर्थक अस्सियोत्तर लेखिकाओं के उपन्यास साहित्य को युग बोध के संदर्भ में निहारने का प्रयास किया है। अस्सियोत्तर कालीन हिंदी साहित्य में महिला उपन्यासकारों का अपना विशिष्ट स्थान है। इस काल में उषा प्रियंवदा, मृदुला गर्ग, ममता कालिया, प्रभा खेतान, सूर्यबाला, चित्रा मुद्गल जैसी लेखिकाओं ने अपनी एक अलग पहचान बना ली है। इन लेखिकाओं के साहित्य के केन्द्र में नारी रही है फिर भी वे अपनी युगीन समस्याओं से अछूती नहीं रही हैं। बाजारवाद और उपभोक्तावाद के प्रभाव में पड़कर बदले हुए सामाजिक माहौल और देश-विदेश की गतिविधियों को इन लेखिकाओं की पैनी दृष्टि ने बड़ी बारीकी से आत्मसात् किया और भोगे हुए सत्य को पूरी निष्ठा एवं ईमानदारी के साथ निष्पक्ष रहकर अपने उपन्यासों के माध्यम से प्रस्तुत किया। सामाजिक विसंगति हो या राजनीतिक भ्रष्टाचार या आर्थिक संकट अथवा सांस्कृतिक-नैतिक अधःपतन - ऐसी कोई युगीन विसंगति एवं त्रासदी नहीं है जिसे अस्सियोत्तर लेखिकाओं ने नजर अन्ताज न किया हो। अस्सियोत्तर लेखिकाओं ने अपने उपन्यासों में युग बोध का सफल और सार्थक अंकन किया है। इन्होंने अपने उपन्यासों में समसामयिक सामाजिक, राजनैतिक, आर्थिक, धार्मिक, सांस्कृतिक एवं नैतिक क्षेत्रों में हुए उलट-फेर को युग बोधानुरूप अत्यंत सहजता एवं सतर्कता के साथ अनावृत किया है। इनके उपन्यासों में युग अपने समस्त वैभव के साथ निखर आया है।

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Title :- Udayaprakash Ki Kahaniyon Mein

Utharadhunik Samvedhy Aur Shilp

उदयप्रकाश की कहानियों में उत्तराधुनिक संवेद्य और शिल्प

RESEARCHER :- Athira JS

GUIDE :- Dr. Girijakumari R

SUBJECT :- HINDI

प्रयोगधर्मी कथाकार उदयप्रकाश अस्योत्तर हिन्दी कथासाहित्य के अप्रतिम हस्ताक्षर हैं, जिन्होंने सर्वप्रथम हिन्दी कहानियों में उत्तराधुनिक संवेदना के विविध पहलुओं को विश्लेषित किया है। 21वीं शती के इस दूसरे दशक में मनुष्य की मनोवृत्ति बदल गई है, जिसने अपनी मनोवृत्ति को तजकर उत्तराधुनिक मनोवृत्ति को अपनाया है। इस कारण आज का मानव न केवल प्रकृति और ईश्वर से अलग हो गया है, बल्कि स्वयं अपनी निजी वैशिष्ट्यों से भी कोसों दूर हो गया है। आज का भयावह समूह भूमण्डलीकरण से उपजी उत्तराधुनिक संस्कृति का है। भूमण्डलीकरण, बाज़ारवाद और उपभोक्तावाद, सूचना प्रौद्योगिकी और मीडिया का प्रभाव, नवउपनिवेशवाद, आतंकवाद और साम्प्रदायिकता, आजीविकावाद, नारीविमर्श, दलित विमर्श, मानवमूल्यों का विषटन, व्यवस्था विरोध, षष्टाचार, बूढ़ों की त्रासदी, राजनीतिक अपराधीकरण, आर्थिक असमानताएँ, उत्तराधुनिक समाज की अपनी विशोषताएँ हैं, जिन्हें अपनी कहानियों के माध्यम से विश्लेषित करके भारतीय जनसमाज को आगाह करने में, उदयप्रकाश को जितनी सफलता प्राप्त हुई है, उतनी शायद ही किसी अन्य रचनाकार को प्राप्त हुई हो। उत्तराधुनिक उपभोक्तावादी संस्कृति के चंगुल में फँसी आम जनता को, उसकी खरी-खोटी बातों को समझाने में उदयप्रकाश का कहानीकार वर्तमान दौर में भी रचनारत हैं। उत्तराधुनिक संवेद्य को दर्शाने के लिए उदयप्रकाश की कहानियों में अनूठे और वैविध्यपूर्ण शिल्पों का प्रयोग हुआ है। अर्थात् शिल्प - वैशिष्ट्य आप की कहानियों की दूसरी प्रमुख विशेषता है।

Major publication appeared in :- Sangrathan, Kerala Jyothi

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Title :- Sreekanth Varma Ka Kadhasahithya : Ek Mulyankan
श्रीकांत वर्मा का कथासाहित्य : एक मूल्यांकन

Researcher :- Jobi Raj

Guide :- Dr. Sreekala K.I

Subject :- HINDI

भारत संघ की राष्ट्रभाषा, राजभाषा और साहित्यिक भाषा हिंदी, विश्व में सर्वाधिक बोली जानेवाली भाषा की हैसियत प्राप्त किये हुए, कई साल बीत गये । हिंदी साहित्य विश्व की प्रमुख भाषा साहित्यों में गिना जाता है । श्रीकांत वर्मा साठोत्तर युगीन कथासाहित्य के आविस्मरणीय कथा-शिल्पी हैं । उनका कथासाहित्य साठोत्तर कालीन महानगरीय निम्न एवं मध्यवर्गीय जीवन का दस्तावेज़ है । उन्होंने अपने कथासाहित्य में महानगरीय जीवन की विभिन्न समस्याओं का चित्रांकन किया है, जो आज भी प्रासंगिक बन हमें संवेदनशील बनाती रहती हैं । महानगरीय जीवन संघर्ष, बदलते स्त्री-पुरुष संबंध, व्यक्ति के जीवन संघर्ष, निरर्थकताबोध, अकेलापन, अजनबीपन, ऊब, एकरसता एवं हीनताबोध, पाश्चात्य संस्कृति के अनुकरण व अतिक्रमण की समस्याएँ अविध - प्रेमसंबंध, सांप्रदायिक - राजनीतिक - समस्याएँ, स्त्री का वर्चस्व, बेकारी की समस्या, बाल मनोविज्ञान आदि बीसियों समस्याओं का चित्रण श्रीकांत वर्मा के कथासाहित्य में खोजे बिना ही देखा जा सकता है । इनके अतिरिक्त भी कई छोटी - बड़ी समस्याएँ श्रीकांत वर्मा के कथासाहित्य में निहित हैं । संक्षेप में, श्रीकांत वर्मा का कथासाहित्य महानगरीय जीवन-बोध की धड़कनों से संपृष्ट है ।

Major Publication appeared in :- Sangrathan, Keral Jyothi

Total number of pages in the Thesis :- 425

Total number of reference cited in the Thesis :- 145

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Title : “Rajendra Yadav Ke Katha Sahithya Mein nari Parikalpama”	
Researcher: Jayasree .S .T	Guide: Dr. S. Sreeja
Subject: Hindi	
<p>The research is an analytical study of the works (Novels and short stories) of famous Hindi writer Rajendra Yadav, based on his portrayal of women characters in urban life. Rajendra Yadav had in depth knowledge of the minute under currents of contemporary Indian Society. He had portrayed in all his major works, the problems faced by Indian Women, in and outside the family circle. Yadav is focusing attention on two grounds- sociological and Psychological. He wanted to disclose the aberrations and atrocities faced by women in Indian Society; the relentless intricacies and intrinsic internal conflicts. I have analysed the topic from a sociological and psychological point of view and tried to establish that Rajendra Yadav was a commuted writer with progressive ideas and unparalleled narrative dexterity.</p>	
<p>Major Publication appeared in : Sangrathan Total no. of pages in the them : 319 Total No. of reference cited in the thesis: 85 Email of Researcher: achusjaya@gmail.com, ajithdrjayasree@gmail.com</p>	

Title : Hindi Sahithya meim Yatra Vritt ek Mulyankan (हिंदी साहित्य में यात्रावृत्त - एक मूल्यांकन)	
Researcher : Raji R.I.	Guide : Dr. J.Umakumary
Subject : Hindi	
<p>इस शोध प्रबंध में हिंदी के यात्रा साहित्यिक रचनाओं व रचनाकारों पर विस्तृत अध्ययन हुआ है। यात्रा साहित्य रचनाओं की विशेषताएँ, भिन्न-भिन्न आधारों पर वर्गीकरण व अन्य विधाओं के साथ तुलना आदि विषय पर भी अध्ययन हुआ है। ऐतिहासिक महत्व वाली विश्व यात्राएँ व यात्रियों का उल्लेख भी इसमें मौजूद है। यात्रा साहित्य के उद्भव और विकास का वर्णन तथा हिंदी यात्रा साहित्य का काल क्रम के अनुसार वर्गीकरण भी इसमें है। प्रमुख साहित्यकारों व रचनाओं का अध्ययन हुआ है। प्रस्तुत अध्ययन से मैं इस निष्कर्ष पर पहुँच गई कि स्वतंत्रता प्राप्ति के बाद यात्रा साहित्य के क्षेत्र में काफी प्रगति आई है। लेखन कार्य अधिक होने लगे है और यात्रा साहित्य एक विधा के रूप में उभरकर आए है। पाठकों की संख्या बढ़ गई है। लेखन शैली में भी विभिन्नता आई है। लेकिन महिला साहित्यकारों की कमी ज़रूर है। यात्रा साहित्य की प्रासंगिकता पर भी प्रकाश डाला गया है। यात्रा साहित्यिक रचनाएँ ऐतिहासिक महत्व का होता है इसलिए इसका महत्व और बढ़ जाता है। इस क्षेत्र में ज़्यादा से ज़्यादा अनुवाद कार्य होने की आवश्यकता है। पत्र-पत्रिकाओं और अन्य संचार माध्यमों का भी योगदान महत्वपूर्ण है। आगे भी इस क्षेत्र में और प्रगति की संभावना है।</p> <p>Key words : वर्गीकरण, तत्व, विशेषताएँ, अन्य विधाओं से तुलना, कालक्रमानुसार वर्गीकरण</p>	

Major Publication appeared in : 'यात्रा साहित्य : खूबियाँ और खामियाँ', केरल ज्योति

Total No of Pages in the thesis: 256, Total No of reference studies in the thesis: 92

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Title: “DR. DHARMAVEER BHARATHI KI KAVITHAVOM MEIN ADHUNIKTHA”	
Researcher: Sreekumar .S	Guide: Dr. J. Umakumari
subject: Hindi Poetry	
<p>This research describes modern trends of the modern poets of Hindi Literature, especially the great Hindi poet Dr. Dharmaveer Bharathi. He was a modern poet who contributed his works including novel, plays, criticism, essays, journalism and various types of poems. His poems are the overflowing of his powerful feelings. This feelings are the reflection of the modern youth and individuals. In this research I separately listed his major works and generally described his poetry. The famous works like ‘Kanupriya’, ‘Andha yug’, ‘Sath Geeth Varsh’ and ‘Sapana Abhi Bhee’ were analyzed critically and found the cream of his poems. He used modern new words and style. His modern poems are the overflow of the powerful feelings of the modern people. The ancient epic characters like Lord Sreekrishna, Radha, Yudhistira, Gandhari, Aswadhama and Shakuny are reflected in minds of the contemporary individuals. The major finding is that the major epic characters are the representatives of the modern people. The poems are totally modern and its style is directed by the modern trends.</p>	
Keywords: Self-reflection, Overwhelming, Modernism	
<p>Major publication appeared in: Sangradhan, Kerala Jyothi Total No of pages in the thesis: 257 Total No of reference cited in the thesis: 62 Email of Researcher: sreekumarrilt@gmail.com</p>	

Title : SATOTHAR HINDI KE NAYIKA PRADHAN NATAK : EK ADHYAYAN

RESEARCHER : Surya.B.R

GUIDE : Dr. Ganesh.M

SUBJECT : HINDI

युगबोध को सर्वाधिक सशक्त रूप से मुखरित करनेवाली विधा है नाटक । इस विधा में बदलते युग और परिवेश के अनुकूल कई परिवर्तन आए हैं। इस युग के अनेक नाटककारों ने नारी को प्रधान पात्र का रूप देकर अनेक नाटकों की रचना की । इन नायिका प्रधान नाटकों में नाटक की महत्वपूर्ण बातों का संबन्ध नायिका चरित्र से होता है। किसी भी साहित्यिक कृति के महत्वपूर्ण नारी पात्र को नायिका कहते हैं। अध्ययन की सुविधा की दृष्टि से हिंदी के कुछ प्रमुख साठोत्तर नाटककारों के एक एक नायिका प्रधान नाटक को चुनकर मैं ने अध्ययन किया है। आज भी भारतीय नारी पूर्ण रूपेण स्वतन्त्र नहीं। रूढ़ी, परंपरा, अंधविश्वास आदि नारी पैरों में बेड़ियाँ डालते है। पारिवारिक, सामाजिक, राजनैतिक क्षेत्र में नारी की प्रतिष्ठा बढ़ी है किन्तु उसका प्रत्यक्ष लाभ उठानेवाली नारियों की संख्या बहुत कम है। आज के नारी अधिकारों से जागृत और सबला दिखाई देती है। फिर भी उसे विभिन्न समस्याओं का सामना करना पडता है जैसे दहेज समस्या, अनमेल विवाह की समस्या नौकरी पेशा नारी की समस्या, पति द्वारा उपेक्षित एवं शोषित नारी की समस्या, कुमारी माता की समस्या आदि। अपने युग की विभिन्न परिस्थितियों का प्रभाव इन नायिका प्रधान नाटकों में देख सकते हैं। मैं इस आध्ययन से नारियों को अधिकार बोध जगाने एवं न्याय की लड़ाई केलिए प्रेरण देना चाहती हूँ। चुने हुए नाटक की नायिकाएँ इसकेलिए सक्षम है।

Key words : परिभाषा एवं स्वरूप, परंपरा, विश्लेषण, युगबोध

Major Publication appeared in : संग्रथन

Total no. of pages in the thesis : 222, Total No. of reference cited in the thesis : 88

Email or Researcher : suryacbnair@gmail.com

Title:उषा प्रियंवदा के कथा साहित्य में नारी चेतना।

Researcher: विनी.एस.एल

Guide:डॉ.गिरिजा.आर

Subject: हिंदी

प्रस्तुत शोध ग्रंथ में उषा प्रियंवदा के कथा साहित्य के (उपन्यास साहित्य और कहानी साहित्य) नारी पात्रों के चेतना का अध्ययन है। उन्होंने मुख्यतः नारी जीवन की विभिन्न विसंगतियों,अकेलापन,तनाव और बदलते परिवेश के प्रभाव को सूक्ष्मता के साथ अंकित किया है। भारतीय एवं पाश्चात्य परिवेश के प्रभाव के फलस्वरूप नारी चरित्र में आनेवाले परिवर्तन और पारिवारिक जीवन मूल्यों के संबन्ध में आधुनिक पीढ़ी की बदलती मानसिकता आदि अनेक उदा:उनकी रचनाओं में विद्यमान है। मैंने इस शोध ग्रंथ में भारतीय नारी की विभिन्न सामाजिक परिस्थितियों एवं समस्याओं के अध्ययन के माध्यम से उषाजी के कथा साहित्य के नारी चेतना को परंपरा और परिवेशगत प्रभाव के आधार पर प्रस्तुत किया है। भारतीय और पाश्चात्य परिवेश के बीच नारी चरित्र में आनेवाले परिवर्तन,पारिवारिक जीवन मूल्यों के संबन्ध में आधुनिक पीढ़ी की बदलती मानसिकता, अपने स्याभिमान एवं अहं की प्रतिष्ठा के लिए झेलनेवाले संघर्ष आदि अनेक विषयों का विश्लेषणात्मक अध्ययन प्रस्तुत शोध ग्रंथ में प्रस्तुत करने का प्रयास किया है।

Major publication appeared in :केरल ज्योति

Total no. of pages in this thesis :270

Total no. of reference cited in the thesis :91

Stream: Arts and Humanities

Subject: *Linguistics*

Title: “Astrological Terms In Malayalam – A Linguistic Study”	
Researcher: Syam .S .K	Guide : Dr. S. Kunjamma
Subject: Linguistics	
<p>The thesis entitled ‘The Astrological terms in Malayalam- A Linguistic Study’, discussed the Linguistic aspect of astrological terms in Malayalam. Present study describes the analysis of all astrological terms through linguistic theories, which consists of phonological, morphological, semantic, borrowing aspects and word formation process. Detailed explanations of the phonological structure of pure astrological terms, other astrological terms, distribution of the vowel phonemes, consonant phonemes, Gemination, Consonant cluster, Syllable, Open Syllable, Closed Syllables, Syllabic structure of Disyllabic, Trisyllabic, Poly syllabic words, Description of derived terms, Dropping, Elision of vowel, Assimilation, Affixation, Prefixes, Prefixing words, Suffixes, Suffixing words, Inflection, Compounding, Endocentric, Exocentric, Reduplication, Syllabic acronyms, Amalgamation, Clipping and Borrowing were discussed. Total number of the short and long vowel phonemes in Nakshathra, Rasi and other Astrological terminology are 22 and that of Consonants are 64. In Semantic Classification, the analysis was done on the basis of meaning of specifics, Which includes Personal Names, Names of Objects; Name begins with Numerals, Name of Festivals and Miscellaneous. Personal Names are classified in to Male and Female names. Four female Personal names are noticed. From these detailed study it was observed that there is no characteristic sound change in Loan words from Nakshathras such as /bharani// rōhini /, /rēvati/ and / abhijit/.</p> <p>Write five keywords: Nakshathras, Rasi, /bharani/, /rōhini/, /rēvati/</p>	
Name of Journal in which major publication appeared: <ul style="list-style-type: none"> • Samakaleena sangeetham, -ISSN: 2319-3506) • Language in India (ISSN 1930 2940) 	
Total No of pages in the thesis: 317 Total No of reference cited in the thesis: 526 Patents: (Indicate if patent has been filed or if you wish to explore such possibility) Email of Researcher: syamsivan@yahoo.co.in	