DEPARTMENT OF ZOOLOGY

BASIC SCIENTIFIC RESEARCH - UGC

The Department of Zoology was established in the academic year 1957 with B.Sc. Zoology. Since 1980 onwards the department has been engaged in research.

Utilization Pattern of BSR Infrastructure Grant

2007 - 2008

A Bioinformatics Lab is established in the Department of Zoology, so, it is included in UG level curriculum, to motivate the students to pursue research. Projects are also undertaken by the students. This course also motivates them to acquire IT skills which will equip them with employable skills. It also promotes them to uptake research in Drug Designing.

2008 - 2009

Canon LBP 2900 New Printer – Used by the students for Practicals as well as for final year student Projects**.**

All the instruments mentioned below are used by the students for Practicals as well as for final year student Projects.

- **Microscope Trinocular Stereo Zoom & Rotatable Microscope** - Used for mounting permanent slides, observing both plant and animal dissected samples. The digital microscope camera adapter can be used to enhance images observed and allow them to be viewed on a monitor, sent to a computer for storage or printing.
- **Homogenizer** –This is used to grind the given plant and animal sample with greater ease, especially when the experiment is tuned to large scale isolation of biomolecules. Homogenization is a very common sample preparation step prior to the analysis of nucleic acids, proteins, cells, metabolism, pathogens, and many other targets. This is more useful in biotechnology practical and also for student's project.
- **UV- Visible Spectrophotometer** – It can be used for the quantitative estimation of organic compounds like DNA, RNA, lipids, protein & pigments that absorb UV radiation. Nucleic acids estimation is done at UV range, whereas protein, carbohydrate and lipid estimation is done at visible range. This is more useful for major practical estimating serum cholesterol, blood glucose etc., and also for student's project.

- **Serological water bath**: It is a device that maintains water at a constant temperature that is used in microbiological laboratory for incubations. These water baths have a variety of usages in tissue culture applications, enzyme reaction studies, growth observation studies, fermentation analysis and various Biochemical qualitative analytical tests.
- **Deep freezer**: Freezers are designed for storing of Blood Components, Serum, Vaccines, Clinical Samples, Molecular biology kits like DNA extraction & Protein estimation kits etc., at low temperatures.
- **Senior Rotary Microtome**: Used to make sections of animal and plant samples.
- **Semi-auto analyzer**: Semi Auto Analyzer is a highly sophisticated system for measuring biochemical indexes by analyzing blood and other body fluid. It executes in an economical, rapid and precise manner, most of important biochemistry and hematology tests.
- **Remi Cooling** *Centrifuge*: This can spin at up to 15,000 rpm to facilitate separation of the different phases of the DNA extraction. This instrument is used for the separation of biomolecules like protein, carbohydrate and DNA where ice cold condition is maintained all through the experiment. The quality and yield of biomolecules are better in refrigerated centrifuge when compared to centrifuge at room temperature isolation. This is more useful for practical purpose of isolating DNA, RNA and protein and also for student's project.
- **Compound microscope & Dissecting Microscope**: Compound Microscope is nowadays used in several fields of sciences like the Microbiology, Botany, Genetics, Cell biology, etc. Dissecting microscope is mostly used in animal dissecting laboratory experiments. It is also used for close observation of microbiological cultures and many more microorganisms.

All the above mentioned instruments are used by the students for Practicals as well as for final year student's Projects.

PROFILE OF THE DEPARTMENT

The Department of Zoology was established in the academic year 1957 with B.Sc Zoology. Since 1980 onwards the department has been engaged in research. The objectives of the Department reflects the Vision of Fatima College is,

"Women Empowerment through Scientific Education"

Objectives of Department of Zoology

- To ensure quality education offering skill based program

- To render entrepreneurial training to make students employable
- To give ultimate insight into the correlation of various branches of biology that has overwhelming applications
- To facilitate Higher education & research (for the advanced learners)

Progression in Curriculum Design

The department offers the advanced papers like Human Genetics, Biochemistry, Microbiology, Bioinformatics, Biotechnology, Immunology, Biophysics & Instrumentation and Genetic Engineering to facilitate Higher education & research among the advanced learners. Papers like Aquaculture, Sericulture and Apiculture are offered to enhance the Employability & the betterment of slow learners.

- 1957 – B.Sc. Zoology
- 2001 - Paramedical papers like Human Physiology, Human Development and Human Genetics
- 2002 - Microbiology was introduced as an allied paper.
    - Certificate Course in "Beauty Culture & Herbal Cosmetics"
- 2003 – Introduction of Microbiology as a Core paper in the V semester
- 2004 – Introduction of Bioinformatics as Extra Credit paper
- 2005 - Certificate Course in Biotechnology
- 2006 – Introduction of Certificate Course in Plant Tissue Culture techniques
- 2008 - Introduction of Certificate course in Bioinformatics
- 2009 - Introduction of Bioinformatics as a Core paper in the VI semester
- 2010 - Introduction of Genetic Engineering as a core Paper

Research Activities

- Group and Individual projects are given to the final B.Sc. students on topics like Medical Entomology, Bioinformatics, Aqua culture & biomedical statistics.

Minor Projects approved by UGC

- **Mycoflora of stored paddy grains"- Mrs. G. Rani-UGC-1988-2000**
- **Mass Production of *Bacillus thuringiensis* enriched Millipede egestion as Biofertilizers. Biopesticide against *Heliothis sp*- Dr. Mrs. Maria Anthoniammal-UGC-2004-2007**
- **Evaluation of 3 chosen Herbal derivatives as Complementary therapy in the Management of Diabetes, Acidity and Cholesterol level.-Mrs. G. Rani-UGC-2004-2007**

- **Isolation and Identification of active Compounds from medicinal plants *Aloe vera,Trigonella foenum- Graceum, Rosa damascena, Azadirachta indica , Hibiscus rosasinensis*-An alternate therapy for health benefits'-Mrs.G.Rani-UGC-2008-2010**
- **Development of a multifunctional microbial strain for control of water-borne mosquito larvae and removal of heavy metals from waste water" -Dr. N.Malathi-UGC-2011-2012**

List the major publications/materials brought out by the students: 2006 - 2011

Student's project

2006:

- Studies on millicompost as bio-fertilizer and growth media for earthworms.
- A comparative study on the growth, survival and reproduction rates of ornamental fishes using artificial and natural diets.
- Effect of panchakaavya on nitrogen assimilation in the green manure crop, dhaincha (sesbaenia bispinosa, scop).
- Effect of vermicompost in the growth of the green manure corp- Daincha.

2007:

- Studies on Millicompost as Bio Fertilizer for Different Mulches of South India.
- Study of the Density of Mosquito Species in the Narimedu Area of Madurai (Tamil Nadu).
- Bin-Nomics of Mosquitoes and Biting Pattern of Armigers Subalbatus in Rural areas of Madurai (Tamil Nadu).
- Genome Analysis of Human Immuno deficiency Virus – I using Bioinformatics tools.

2008:

- Plant extraction from TAMARINDUS INDICUS, PONGAMIA GLABRA, AZARDIRACTA INDICA for testing antimicrobial activity.
- A pilot study to check the quality and to identify the presence of microorganism in different brand of ice creams.
- Comparative genomics – human and rhesus monkey porin using bio informatics tools.
- A survey on cancer, major killer disease prevailing in Madurai region.
- An analysis and on C/N ratio of vermin composting produced from sugarcane trash with cow dung by earth worm *Eisenia fetida*.
- Comparative genomics- human and mouse keratin 86 using bioinformatics tools.
- Comparative genomics- human and rhesus monkey porin using bio informatics tools.

- Comparative genomics- human and zebra fish acetyl cholinesterase enzyme using bio informatics tools.
- Comparative genomics- human and rat amylase using bioinformatics tools.
- Comparative genomics- human and rat acetyl cholinesterase using bioinformatics tool.
- Comparative genomics- human and cow lactase using bioinformatics tools.
- Comparative genomics- human and mouse lactase using bioinformatics tools.
- Comparative proteomics: HIV-1 GAG-POL and herpes viral major capsid protein.
- Comparative proteomic: GAG-POL of HIV-1 and Orf lab of SARS Cov using bioinformatics tools.
- Comparative proteomics: HIV-1 GAG-POL and herpes viral major capsid triplex subunit.
- Comparative proteomics: HIV-1 GAG-POL and herpes viral DNA replicas origin binding helicase.
- Comparative proteomic: GAG-POL of HIV-1 and E2 glycoprotein of sars Cov using bioinformatics tools.
- Similarity analysis: human immune deficiency virus-1& simian immuno deficiency virus using emboss align.
- Similarity analysis: human immune deficiency virus-1& simian immuno deficiency virus using NCBI BLAST.
- Similarity analysis: human immune deficiency virus-1& simian immuno deficiency virus using WU-BLAST.

2010:

- Review of Literature on the Effects of Toxicants on Edible Fish with Special Reference to Human Consumption.
- Similarity Analysis: Nonstructural PolyProtein of Chickungunya Virus and PolyProtein of Dengue Virus 1 using Bioinformatics Tools.
- Similarity Analysis: Heamagglutinin Protein of Swine Influenza A-H1N1 Virus and PolyProtein of Dengue Virus 1 using Bioinformatics Tools.
- Similarity Analysis: Nucleocapsid Protein of Swine Influenza A-H1N1 and PolyProtein of Dengue Virus 1 using Bioinformatics Tools.
- Similarity Analysis: Matrix Protein and Nonstructural Protein(NS1) of Swine Influenza A-H1N1 and PolyProtein of Dengue Virus 1 using Bioinformatics Tools.
- Similarity Analysis: PolyProtein of Dengue Virus 1and GAG PolyProtein of HIV2 using Bioinformatics Tools

2011:

- Proteomics: Comparison of Replicase in Corynebacterium.
- A Piolt Study of Mollusca.
- Proteomics: Comparison of Proteins in Mammals.
- Indoor Study of Mosquitoes from the Rural and Urban Areas of Madurai City.
- A Statistical Survey on Prevalence of Diabetes Patients in Madurai Region
- Genome analysis of some selected strains of metal degrading microorganism using bioinformatic tools.

2012:

- Treatment of Pityriasis simplex capillitii through ayurvedic products.
- A comparative study on growth rate in ornamental fishes using normal pelleted food and spirulina.
- Occurrence of solar UV-B (280-320 nm) resistant plants on natural ecosystem.
- Survey on the prevalence of diabetes in and around Madurai region.
- The efficacy of repellant activity on synthetic cream & essentials oils against the mosquito.
- Phylogenic studies of metal binding proteins of some selected micro organisms using bioinformatics tools.

Research Publications by students

- Rita Elizabeth S. Roy and Rehana Burvin, 2009. Density of Culex spp. Of Mosquitoes in Madurai, Tamil Nadu, South India. Insect Environment, Vol.15, No.2,Pg.91-92

- Rita Elizabeth S. Roy, Ruth Angel Celia J and Andrew Pradeep M. "Indoor study of the Bio-ecology of mosquitoes in the rural area of Vilangudi, Madurai city (Tamil Nadu) in the Proceedings of 4th conference of Medical Arthropodology" Dec.20-21, 2010 organized by Centre for Research in Medical Entomology (ICMR), Madurai. Pg. 11-1

PhD'S

- Dr. Maria Anthoniammal – Ph.D. - Comparative studies on the Ecology of chosen Diplopods occurring in Madurai and Palani Hills - April, 2003.
- Dr. Mrs. Rita Elizabeth Roy –Ph.D. - Bio Ecology of Mosquitoes in the sub-urban areas of peripheral regions of Madurai - December, 2001.
- Dr. Antony Amala Jayaseeli – Ph.D. - A Study on some aspects of Biology of Scallops of Gulf of Mannar, Southeast Coast of India -2005.

- Dr. Malathi -PhD-Tissue Culture-2003.
- Dr. T. Elizabeth Thangamani Sunitha – Ph.D. - Bioecology and behaviour of mosquitoes in urban and suburban areas of Madurai, 2008.
- Dr. N.Shanthi – Ph.D. - Effect of enhanced solar UV-B radiation on plants at different growing seasons, 2006.
- Mrs. A. Tamil Selvi – PhD ongoing-Bioremediation of industrial waste.

Faculty

S. No.	Name	Qualification	Designation	Specialization
1.	Mrs. A. Tamil Selvi	M.Sc,SLET,PGDBI	Head & Assistant Professor	Chronobiology Bioinformatics Biochemistry
2.	Dr.(Mrs.) Antony Amala Jayaseeli	M.Sc, B.Ed, SLET, M.Phil,PhD,PGDBI	Assistant Professor	Marine Biology Bioinformatics Biochemistry
3.	Dr.(Mrs.) N. Malathi	M.Sc, PhD	Assistant Professor	Plant molecular Biology & Ecophysiology
4.	Sr. Biji Cyriac	M.Sc, B.Ed, M.Phil	Assistant Professor	Genetics
5.	Dr. (Mrs.)Elizabeth Thangamani Sunitha	M.Sc, M.Phil PhD	Assistant Professor	Vector Biology (Medical Entomology)
6.	Dr. (Mrs.) N. Shanthi	M.Sc, PhD	Assistant Professor	Plant Stress Physiology

Retired Faculty

S. No.	Name	Designation	Duration
1.	Dr (Mrs.) T. Maria Anthoniammal- M.Sc., B.Ed., M.Phil., PhD.	HOD	1.8.1974 - 31.5.2007
2.	Dr (Mrs.) Rita Elizabeth Roy -M.Sc., M.Phil., PhD.	HOD & Associate Professor	1.7.1978 - 31.5.2011
3.	Mrs. G.Rani- M.Sc., M.Phil.	Associate Professor	1.7.1978 - 31.5.2011

RESEARCH PUBLICATIONS BY FACULTY

2006 - 2007

- **Rita Elizabeth Roy**, 2007.Temporal variation in the4 biting rhythm of Culex species in the peripheral regions of Madurai, Tamil Nadu. Insect environment, Vol.:13, No.3, Pg.112-11

- **Rita Elizabeth Roy**, 2007. Preliminary comparative study of density of Mosquito species in Rural and Urban areas of Madurai, Tamil Nadu. Insect environment, Vol.:13, No.3 Pg.113.
- **Rita Elizabeth Roy**, 2006.The study of Mosquito species from Rural and Urban areas of Madurai city (Tamil Nadu). Insect environment,Vol.:12, No.2, Pg. 80-82.
- **Elizabeth Thangamani Sunitha.T**, 2006.Biodiversity pattern of mosquito fauna in urban Madurai, Insect environment, **Issue no.12**.
- **Elizabeth Thangamani Sunitha.T**, 2006.Existenace of nocturnal biting behaviour in *Armigeres subalbatus* Insect environment **Issue no.12.**

2007 - 2008

- **Rita Elizabeth Roy**, 2008.Study of the biting pattern of Armigeres subalbatus (Coquillet) in Vilangudi and Fatima college hostel at Madurai, Tamil Nadu. Insect environment, Vol.:13, No.4, Pg.172-173
- **Dr.N.Malathi** .*Proceedings in the international* ***conference*** *entitled* "Adopted Tools and Guidelines for Creation, Management and Implementation of eContent for Higher Education" organized by Presidency College, Chennai.Pg72, 2008.
- **N.Shanthi and** G.Kulandaivelu**.** Seasonal variation on the UV-B enhanced solar radiation induced changes in *cyamopsis tetragonaloba*L.) Journal of plant biology .vol.35 (3)1-8(2008).
- **Shanthinatarajan and** Govindasamy Kulandaivelu Effect of solar UV-B radiation (280-320) on thylakoid organization of some legume plants. J.current science.vol.12,(2):777-782(2008).

2008 - 2009

- **Rita Elizabeth S.Roy** and Rehana Burvin, 2009. Density of Culex spp. Of Mosquitoes in Madurai, Tamil Nadu, South India. Insect Environment, Vol.15, No.2,Pg.91-92
- **Rita Elizabeth S.Roy**, 2009. Biting pattern of Culex quinquefasciatus say in Madurai city, Tamil Nadu, South India. Insect Environment, Vol.15, No.2,Pg.92-93
- **Mrs.A.Tamil Selvi**."Biodiversity-informatics-An Over view" in the *proceedings of national seminar* in Bio-resources management-an integrated approach July 23-24, 2009 organized by Fatima College, Madurai.
- **Dr.N.Malathi.** *Proceeding in the national seminar entitled* "**Sustaining and enhancing Quality in higher education: Intervention strategies**" organized by Fatima College, Madurai.Pg32-39, 2009.
- **Dr.N.Malathi.** in the *proceedings of national seminar* in Bio-resources management-an integrated approach July 23-24, 2009 organized by Fatima College, Madurai.Pg 56, 2009.
- **Shanthinatarajan and** Govindasamy Kulandaivelu**.**Combined effect of solar UV-B radiation (280-320nm) and water stress on red gram Ecology, Environment and conservation journal. 15(4):124-204, 2009**.**

2010 - 2011

- **Rita Elizabeth S. Roy**, Ruth Angel Celia J and Andrew Pradeep M. "Indoor study of the Bio-ecology of mosquitoes in the rural area of Vilangudi, Madurai city (Tamil Nadu) in the *Proceedings of 4th conference of Medical Arthropodology*" Dec.20-21, 2010 organized by Centre for Research in Medical Entomology (ICMR), Madurai. Pg. 11-12
- **Dr. (Mrs.) Rita Elizabeth Roy** presented paper titled- "The study of diversity and density of mosquitoes in the suburban areas of Madurai city- TN", at the International Conference on Environmental Sustainability: Challenges and strategies- organized by the department of History, Economics, sociology and commerce, Fatima College, Madurai held on 17th and 18th February 2011.

Average citation index and impact factor of publications

Dr. N. Malathi –Journal of Plant Biology - **Citation Index 2**

Dr. N. Shanthi - Journal of plant biology-**Citation index -2**

Ecology, Environment and conservation journal-**Citation index -2**