Thiagarajar College::Madurai – 625 009

Reaccredited with A Grade by NAAC (3rd Cycle)
34th Ranking in NIRF 2019

NATIONAL CENTRE OF EXCELLENCE IN STATISTICAL AND MATHEMATICAL MODELLING ON BIORESOURCES MANAGEMENT

(UNDER FAST SCHEME)

PROGRESS REPORT
(September 2014 – August 2019)

Submitted to

MINISTRY OF HUMAN RESOURCE DEVELOPMENT
GOVERNMENT OF INDIA
NEW DELHI – 110 001

139 – 140, Kamarajar Salai, Teppakulam
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About the Centre

The CoE has been established as a nodal centre to promote multidisciplinary research among the researchers, academicians and students through teaching, training and research with the following objectives

- To provide an integrated multidisciplinary inventorying and monitoring systems for sustainable utilization and conservation of bioresources
- To gain knowledge on bioresources at Regional, National and Global scales
- To develop skills for analysis, modelling, simulation and evaluation of bioresources management
- To draw attention to modern innovative ways of generating income through bioresources
- To establish a 'Regional Bioresources Monitoring Facility' for the benefit of students, researchers, stakeholders and policy makers

AREAS OF FUNCTIONING OF THE CoE (MHRD) AS GIVEN IN THE DETAILED PROJECT REPORT

I. Research
II. Training
III. Teaching

Proforma for Submission of Information of Achievements under FAST Scheme

Name of the Scheme : Training and Research in Frontier Areas of Science and Technology (FAST)

Name of the Institution : Thiagarajar College

Name of the CoE : Bioresource Management

Duration : Sep 2014 – June 2019

S.No	Indicators	Achievements
1.	No. of Seminars/ Conferences organized	04
2.	No. of Winter school/ Workshops/Training programme organized	20
3.	No. of PhDs completed under the scheme	Completed 01 Ongoing 05
4.	No. of research papers published in peer reviewed national and international journals and papers published in UGC accredited journals on thematic areas	17

Seminars/ Conferences organized:

Sl.No	Title	Date
1.	National conference Recent trends in mathematical and physical modelling and bioresource management strategies	12.02.19 & 13.02.19
2.	International seminar on waste management	03.09.18
3.	National Conference on Mathematical modelling and Bioresource management (MMBRM – 2017)	06.04.17 & 07.04.17
4.	National Conference on Recent Developments on Emerging fields in Pure and Applied Mathematics. Organized by Department of Mathematics and NCoE, MHRD	12.03.2015 & 13.03.2015

I. RESEARCH

RECOGNIZED MULTI DISCIPLINARY RESEARCH CENTRE:

The Centre has been recognized as Full time Research Centre to carryout multidisciplinary Research leading to Ph.D., Degree by Madurai Kamaraj University. Scholars from Bioresource Management, Zoology, Botany and Mathematics are carrying out research work leading to Ph.D degree

RESEARCH SCHOLARS:

S.No	Name	Designation	Com.	Subject	Status
01	Dr. R.P. Aditya	Former Research Scholar	OBC	Mathematics	Completed
02	Mr. S. Murali Krishnan	Senior Research Fellow	OBC	Bioresource Management	On going
03	Mr. K. Marimuthu	Project Fellow	SC	Zoology	On going
04	Mr. K. Sonaimuthu	Project Fellow	OBC	Zoology	On going
05	Mr. E. Shanmugam	Project Fellow	OBC	Mathematics	On going

OTHER STAFF:

The following staffs have been appointed to carryout activities of the centre

S.No	Name	Designation	Com.
01	Mr. P. Madhan	Field Assistant	SC

PUBLICATIONS IN JOURNALS/CONFERENCE PROCEEDINGS:

- Muralikrishnan S., Madhan P. Nagendran N. A., Pandiaraja D. and Kubendran T. 2018. Studies on assessment of heavy metals in samples collected from surrounding area of recycling plant in Madurai district of Southern India. Global journals of Bio-science and biotechnology. 7(3): 490-498.

- Mahesh M., Muralikrishnan S. and Kannan D.P. 2018. Interactive phenomenon of plants and avain diversity on vettangudi birds sanctuary, Southern India. Science international. 6 (2): 65-70.

- Kubendran, T., Murali Krishnan, S., Selvakumar, C, C., Sidhu, A. K. and Akhil N. (2018). Composition and trophic categorization of aquatic insects and biomonitoring potential of selected hill streams of Western Ghats, India. *International Journal of Ecology and Environmental Sciences* 44 (1): 103-110

- S. Murali Krishnan, N. Arun Nagendran, D. Pandiaraja, Akhil Nair and T. Kubendran 2017. Avifaunal diversity and water quality analysis of an Inland pond, Kondagai Village, Sivaganga District, South India. *International Journal of Current Microbiology and Applied Science.* 6(7):4437-4452

- T. Kubendran, C. Selvakumar, Avatar KaurSidhu, Akil Nair and S. Murali Krishnan 2017. Baetidae (Ephemeroptera: Insecta) Biologifal Indicators of Environmental Degradation inn Tamaraparani and VaigaiTiver Basins of Southern Western Ghats, India. *International Journal of Culrrent Microbiology and Applied Sciences.* 6(6): 558-572.

- T. Kubendran, C. Selvakumar, Avatar KaurSidhu, S. Murali Krishnan and Akhil Nair 2017. Diversity and distribution of Baetidae (Insecta: Ephemeroptera) Larvae of Streams and River of the Southern Western Ghats, India. *Journal of Entomology and Zoology Studies.* 5(3):613-625.

- Murali Krishnan, S., Arun Nagendran, N., Pandiaraja, D. and Vinayagamoorthi, P 2017. Isolation and characterization of Amylase Production and optimization of Enzyme Production. *International Journal of Development Research.* 07(12)18128-8134.

- Pandiaraja, D. 2017. Stability analysis of mosquito life span model with delay. Advanced dynamical systems and applications. 12(2): 195 – 204.

- Pandiaraja, D. Aditya, R.P. and Abirami, S. 2017. An algorithmic approach to cloud computing using graph theoretical modelling. Advances in Computational Sciences and Technology. 10(6): 1773 – 1784.

- Avifaunal diversity and water quality analysis of an inland pond, Kondagai Village, Sivaganga District, South India. 2017. Int. J. Curr.Microbiol. App. Sci. 6(7): 4437 – 4452.

- Muralikrishnan, S., Arun Nagendran, N. and Pandiarajan, D. 2017. Survey of birds in Chitrangudi and Kanjirankulam village ponds in relation to vegetation: An avian pradise of South India. Journal of Entomology and Zoological studies (In press)

- Pandiaraja, D, Nagendran, N.A., Murugeswari, D. and Mishra, V.N. 2017. Spatial competition mathematical model analysis for the invasion, removal of Kappaphycus algae in Gulf of Mannar with propagation delays. Communications in Mathematical biology and Neuroscience,

- Muralikrishnan, S., Keerthiga Devi, P., Rohini, R. and Arun Nagendran, N. 2016. Isolation and characterization of amylase producers and optimization of enzyme production. In.: Recent trends in microbiology organized by the Department of Microbiology, Algappa University, Karaikudi. 20 & 21st December 2016.

- Vigneswaran, K. 2016. Efficacy of aqueous extract of *Tinospora cordifolia* stem as immunostimulant in *Oreochromis mosambicus*. In: National Seminar on Conservation methods and biopotential assessment of biodiversity, Sourashtra College, Madurai. 16th March 2016.

- Madhan, P. 2016. Isolation of multidrug resistant *K. pneumonia* from currencies collected in Madurai region. National Conference on Trends in Healthcare and Biotechnology: Opportunities & Challenges sponsored by Science and Engineering Research Board (SERB), New Delhi organized by AVVM Sri Pushpam College, Tanjavur, 22 & 23rd January.

- N. Saranya, 2015. A review about causes, effects & Controlling measures of pollution on Biodiversity., International Conference on Biodiversity and Evaluation – Perspective & Paradigm shift organized by Sree Sankara College, Kalady, 2 & 3rd December.

- Pandiaraja, D and Murugeswari, D. 2015. Stability analysis for an HIV/AIDS epidemic model with an additional delay. (In.) Proceedings of National Conference on Recent Developments on Emerging fields in Pure and Applied Mathematics. Organized by Department of Mathematics and NcoE, MHRD. 12 & 13 March 2015.

- Pandiaraja, D. and Adithya, R.P. 2015. Generalized Eulerianess in Non-linear Eulerian graphs. (In.) Proceedings of National Conference on Recent Developments on Emerging fields in Pure and Applied Mathematics. Organized by Department of Mathematics and NcoE, MHRD. 12 & 13 March

- Pandiaraja, D. and Murugeshwari, D. 2015. Computational Analysis of He's method and Homotopy Analysis method to non-linear Damped driven Pendulam, Jamal special Journal

- Pandiaraja, D., Nagendran, N.A., Chandrasekaran, S. and Aditya, R.P. 2014. Graph theoretical modeling and analysis of fragile honey bee pollination network. Curr.Sci., 107(12): 1988 – 1996.

- Chandrasekaran, S., Saravanan, S., Kamaladhasan, N., Saraswathi, K. and Nagendran, N.A. 2014. Impact of *Prosopis juliflora* on reproductive success of migratory birds at Vettangudi Birds sanctuary of South India. Curr.Sci. 106(5): 676 – 678

- Kamalakannan, B., Jeevamani, J.J.J., Nagendran, N.A., Pandiaraja, D. and Chandrasekaran, S. 2014. Impact of removal of invasive species *Kappaphycus alvarezii* from coral reef ecosystem in Gulf of Mannar, India, Curr.Sci. 106(10): 1401 – 1408.

MANUALS & PROCEEDINGS PUBLISHED FROM THE CENTRE:

- P. Anitha Margret, S. Kulandaivel, Dr. K. Renuka Devi, Dr. C. Balachandran, S. Murali Krishnan (2017) **Manual on Molecular Techniques**, National Centre of Excellence. MHRD, New Delhi

- Dr. K. Renuka Devi, Dr. C. Balachandran, S. Kulandaivel, P. Anitha Margret, S. Murali Krishnan (2017) **Manual on Bioinformatics and Drug Designing**, National Centre of Excellence, MHRD, New Delhi.
- Nagendran, N.A., Kulandaivel and Saranya, N. 2016. **Manual on UV Spectrophotometric Techniques**, National Centre of Excellence, MHRD, New Delhi.
- Nagendran, N.A., Kulandaivel, S., Muralikrishnan, S and Rohini, R. 2016. **Manual on Kinetics of marine microbial products**. National Centre of Excellence, MHRD, New Delhi.
- Pandiaraja, D., (2015) **Proceedings of National Conference on Recent Developments on emerging fields in Pure and Applied Mathematics.** National Centre of Excellence, MHRD, New Delhi

PROJECTS CARRIED OUT BY POST GRADUATE STUDENTS

2017 – 19 BATCH

S.No	REG. No.	NAME	GUIDE	TITLE
01	17SPBT03	ANJALI DEVI, L	CB	Isolation and characterization of keratinase producing bacteria and their potential to mosquito control
02	17SPBT05	ELAKKIYA, M	KR	Identification and analysis of bioactive compound from *Tribulus terrestris* to improve the melanin content of zebrafish
03	17SPBT06	KARTHIGA DEVI, M.M	NAN	Microbial degradation of textile dyes
04	17SPBT08	NIVETHA, I	AAM	Characterization study on subtilisin isolated from soil and establishing as a potential inhibitor combating melanogenesis with an inslico approach
05	17SPBT09	PRIYA, B	KS	Bioplasitc production from selected organic substances
06	17SPBT10	SHALINI MAI, K.V.	CB	Synthesis of silver nanoparticles from gut microbes of larval black fly against disease causing dengue and malarial vectors
07	17SPBT12	SUBALAKSHMI, E	CB	Isolation, characterization and optimization of pectinase enzyme production at low temperature from fruit peel wastes
08	17SPBT13	SUKANYA, M	AAM	Evaluating the neuro-pectant and immunoregulatory effects of *Lactobacillus* sp. on depression induced zebra fish models
09	17SPBT14	UMA MAHESHWARI, D	KR	Stimulation of melanin content in Zebrafish system by active group of *Albizia lebbeck*

2016 – 18 BATCH

S.No	REG. No.	NAME	GUIDE	TITLE
01	16SPBT01	ARUN KUMAR, K	AM	Evaluating the antidepressant competence of vital phytocompounds in edible mushroom by GC-MS and in silico assay
02	16SPBT02	KISHORE, P	RA	Nutraceutical analysis in *cocosnucifera* (young shoot)
03	16SPBT04	CHITRAKALA, U	KS	Screening of suitable microorganisms for polythene degradation
04	16SPBT05	HEMAA, N.R	NAN	Characterization and optimization of Riboflavin production by Bacteria associated with Earthworm gut (*Iseniafoetida*)
05	16SPBT06	MAREESWARI, R	AM	Determination of L-Tryptophan and its derivatives from selected edible mushrooms to target depression and facilitate drug delivery
06	16SPBT07	MEENAKSHI, V	SKV	Formulation of novel media for the plant tissue culture of selected explant
07	16SPBT08	NAGARANI, V	CBR	Isolation identification and characterization of kerationolytic organism from feather waste
08	16SPBT09	PUVINA, T	CBR	Study of heavy metals concentration in water sediment and fish from vandiyur lake, Madurai, Tamilnadu and their environmental significance
09	16SPBT11	SAHAYA SHILPA DALVI, A	KRD	Analysis and comparison of heavy metals and lactose in cow's milk from different regions
10	16SPBT12	SELVAPRIYA, S	KS	Preparation of microbial culture medium from selected plant wastes
11	16SPBT13	SHANMUGA PRIYA, A	CR	Bioactivity and phytochemical analysis of the marine macro algae *Sargassumilicifolium*
12	16SPBT14	SHEGANAZ, S	KRD	A study on the phytochemical, Antibacterial and Antioxidant activity of seed extract of *Swieteniamahagoni*
13	16SPBT15	SIVAPRATHA, A	TSRL	Comparative analysis of Biofuel extracted from *Pongamiapinnata*and *Swieteniamahagoni*seeds
14	16SPBT16	SUBHASHINI, M	NAN	Molecular docking of bacterial proteins with selected natural dye compound and assessment of antimicrobial activity
15	16SPBT17	VASUUPRADHAA, R	BR	Biochemical characterization of Lysozyme in *Channapunctate*
16	16SPBT18	YOGESHWARI, V	KRD	Purification and heavy metal analysis of drinking water by using natural coagulant of *Moringaoleifera* and *Strychnospotatorum* seeds

2015 – 17 BATCH

S.No	REG. No.	NAME	GUIDE	TITLE
01	15SPBT01	MADHAN, P	VS	Study of heavy metal accumulation in plants cultivated with waste water at Vellakal collection site
03	15SPBT03	ABIRAMI, P	NAN	Isolation and characterization of heavy metal degrading biosurfactant produced by *Alcaligenes faecalis*
04	15SPBT05	ASIFA NASREEN, S	CB	Larvicidal activity of synthesized silver nanoparticles using Lactobacillus against vector mosquitoes
05	15SPBT06	BALACHANDRIKA, D	AS	Studies on the synthesis and activity of beta galactosidase produced from *Candida tropicalis*
06	15SPBT07	HELEN PRIYANKA, P	NAN	Optimization of acetic acid production using microbes isolated from decayed fruits
07	15SPBT08	KEERTHTHANA, B	VS	Extraction and characterization of pigment produced from bacteria and its application in industries
08	15SPBT09	KRISHNA VENI, P	TSR	Standardization of microbial alginate production and its application in bioremediation
09	15SPBT10	KRITHIKA, S.K.	AS	Characterization of amino acid production by microbes isolated from soil
10	15SPBT11	MAHESHWARI, M	Rm.M	A facile green synthesis of silver nanoparticles using *Piper betle* and its therapeutic applications
11	15SPBT13	PAVITHRA, S	DPR	Optimization of cellulase enzyme production by microbes isolated from termite and grasshopper
12	15SPBT14	POOJA ABARNA, P	AS	Optimization of protease producing bacteria isolated from soil
13	15SPBT15	POORNIMA AISHWARYA, S	KS	Effect of secondary metabolites of *Notonia grandiflora* on selected microorganisms
14	15SPBT17	RISWANA THASWIN, S	VS	Synthesis, optimization and application of marine bacterial calcite
15	15SPBT18	SANGEETHA, A	CB	Plant extract mediated synthesis of silver nanoparticles and its antimicrobial activity against human pathogenic bacteria
17	15SPBT20	SINDHUJA, R	VS	Screening and characterization of phosphate solublizing bacteria from rhizophere soil
18	15SPBT21	SOUNDARYA, S	CB	Molecular docking studies of natural alkaloids against acetyl choline esterase in vector mosquitoe
19	15SPBT22	SRILALITHA, S	VS	Synthesis of silver nanoparticles using banana peel extract and its antibacterial efficiency
20	15SPBT23	SURUTHI, M	CR	Biochemical profile and heavy metal analysis in the tissue of choosen marine crabs
21	15SPBT25	YAAMINI, R	AS	Characterization of liposomes synthesized from the lipids of oleaginous yeast isolated from soil

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SURVEY OF BIRDS IN SELECTED PONDS

Table. 1. List of Birds in Koonthankulam Birds Sanctuary, Tirunelveli District

S.No	Family	Zoological Name	Common Name
01	Accipitridae	*Accipiter badius*	Shikra
02	Accipitridae	*Milvus migrans*	Black Kite
03	Alaudidae	*Mirafra cantillans*	Singing Bush Lark
04	Alcedinidae	*Halcyon smyrnensis*	White-breasted Kingfisher
05	Alcedinidae	*Alcedo atthis*	Common Kingfisher
06	Anatidae	*Anas poecilorhyncha*	Spot-bill Duck
07	Apodidae	*Tachymarptis melba*	Asian palm-Swift
08	Ardeidae	*Egretta garzetta*	Little Egret
09	Ardeidae	*Bubulcus ibis s*	Cattle egret
10	Ardeidae	*Ardeola grayii*	Indian Pond-heron
11	Ardeidae	*Casmerodius albus*	Great Egret
12	Ardeidae	*Egretta intermedia*	Median Egret
13	Artamidae	*Artamus fuscus*	Ashy Woodswallow
14	Charadriidae	*Charadrius dubius*	Little ringed plover
15	Charadriidae	*Vanellus indicus*	Red-wattled Lapwing
16	Charadriidae	*Vanellus malabaricus*	Yellow-wattled lapwing
17	Ciconiidae	*Anastomus oscitans*	Asian Openbill
18	Columbidae	*Columba livia*	Rock Pigeon
19	Columbidae	*Streptopelia chinensis*	Spotted Dove
20	Columbidae	*Streptopelia decaocto*	Eurasian collared dove
21	Columbidae	*Streptopelia sengalensis*	Laughing Dove
22	Coraciidae	*Coracias benghalensis*	Indian roller
23	Corvidae	*Corves splendens*	House Crow
24	Corvidae	*Corves macrorhynchos*	Jungle Crow
25	Cuculidae	*Centropes sinensis*	Greater Coucal
26	Cuculidae	*Eudynamys scolopacea*	Asian koel
27	Cuculidae	*Clamator jacobinus*	Pied Cuckoo
28	Dicruridae	*Dicrurus macrocercus*	Black Drongo
29	Dicruridae	*Dicrurus leucophaeus*	Ashy Drongo
30	Lybiidae	*Stactolaema olivacea*	Green barbet
31	Meropidae	*Merops philippinus*	Blue-tailed Bee-eater
32	Monarchidae	*Terpsiphone paradise*	Asian Paradise Flycatcher
33	Motacillidae	*Motacilla maderaspatensis*	White-Browed Wagtail
34	Motacillidae	*Anthus rufulus*	Paddyfield Pipit

35	Muscicapidae	*Saxicoloides fulicata*	Indian Robin
36	Muscicapidae	*Luscinia brunnea*	Indian Blue Robin
37	Nectariniidae	*Nectarinia asiatica*	Purple Sunbird
38	Nectariniidae	*Nectarinia zeylonica*	Purple-rumped Sunbird
39	Oriolidae	*Oriolus oriolus*	Eurasian Golden Oriole
40	Passeridae	*Passer domesticus*	House Sparrow
41	Phalacrocoracidae	*Phalacrocorax niger*	Little Cormorant
42	Phasianidae	*Pavo cristatus*	Indian Peafowl
43	Picidae	*Dinopium benghalense*	Black-Rumped Flameback
44	Psittacidae	*Psittacula krameri*	Rose-Ringed Parakeet
45	Pycnonotidae	*Pycnonotus cafer*	Red-Vented Bulbul
46	Rallidae	*Amaurornis phoenicurus*	White-breasted Waterhen
47	Sturnidae	*Acridotheres tristis Linnaeus*	Common Myna
48	Threskiornithidae	*Threskiornis melanocephalus*	Oriental White Ibis
49	Upupidae	*Upupa epops*	Common Hoopea
50	Anatidae	*Anas querquedula*	Garganey
51	Anatidae	*Anas crecca*	Common Teal
52	Motacillidae	*Motacilla maderaspatensis*	White-Browed Wagtail
53	Podicipedidae	*Tachybaptus ruficollis*	Little Grebe
54	Rallidae	*Gallinula chloropus*	Common Moorhen
55	Rallidae	*Fulica atra*	Common Coot
56	Anhingidae	*Anhinga melanogaster*	Darter
57	Threskiornithidae	*Platalea leucorodia*	Eurasian Spoonbill
58	Threskiornithidae	*Plegadis falcinellusv*	Glossy ibis
59	Threskiornithidae	*Pseudibis papillosa*	Black Ibis
60	Anatidae	*Anas acuta*	pintail
61	Estrildidae	*Euodice malabarica*	Indian silverbill
62	Leiothrichidae	*Turdoides striata*	Jungle babbler
63	Scolopacidae	*Tringa nebularia*	Common greenshank
64	Pelecanidae	*Pelecanus philippensis*	Spot-billed pelican
65	Pelecanidae	*Pelecanus onocrotalus*	Great white pelican
66	Ciconiidae	*Mycteria leucocephala*	Painted stork
67	Anatidae	*Sarkidiornis sylvicola*	Comb duck
68	Anatidae	*Anas arcuata*	Whistling duck
69	Recurvirostridae	*Himantopus himantopus*	Black-winged stilt
70	Strigidae	*Athene brama*	Spotted owlet
71	Rallidae	*Porphyrio porphyrio*	Purple moorhen
72	Anatidae	*Anser indicus*	Bar-headed goose
73	Scolopacidae	*Calidris alpina*	Sandpiper
74	Accipitridae	*Haliastur indus*	Brahminy kite

Table. 2. List of Birds in Mandela Nagar pond, Madurai district

S.No	Family	Zoological name	Common name
01	Aalaudidae	*Mirafra cantillans*	Singing bush lark
02	Accipitridae	*Milvus migrans*	Black kite
03	Accipitridae	*Accipiter badius*	Shikra
04	Alcedinidae	*Alcedo atthis*	Common kingfisher
05	Alcedinidae	*Halcyon smyrnensis*	White breasted kingfisher
06	Anatidae	*Anas crecca*	Commom teal
07	Anhingidae	*Anhinga melanogaster*	Darter
08	Apodidae	*Tachymarptis melba*	Asian palm swift
09	Ardeidae	*Mesophoyx intermedia*	Median egret
10	Ardeidae	*Casmerodius albus*	Great egret
11	Ardeidae	*Ardeola grayii*	Indian pond heron
12	Ardeidae	*Bubulcus ibis*	Cattle egret
13	Ardeidae	*Egretta garzetta*	Little egret
14	Artamidae	*Artamus fuscus*	Ashy wood swallow
15	Charadriidae	*Vanellus indicus*	Red watted lapwing
16	Ciconiidae	*Anastomus oscitans*	Asian openbill stork
17	Columbidae	*Streptopelia decaocto*	Eurasian collared dove
18	Columbidae	*Columba livia*	Rock pigeon
19	Columbidae	*Streptopelia engalensis*	Laughing dove
20	Columbidae	*Streptopelia chinensis*	Spotted dove
21	Coraciidae	*Coracias benghalensis*	Indian roller
22	Corvidae	*Dentrocitta vagabunda*	Rufous treepie
23	Corvidae	*Corves macrorhynchos*	Jungle crow
24	Corvidae	*Corves splendens*	House crow
25	Cuculidae	*Cuculus poliocephalus*	Lesser cuckoo
26	Cuculidae	*Eudynamys scolopacea*	Asian koel
27	Cuculidae	*Clamator jacobinus*	Pied cuckoo
28	Cuculidae	*Centropes sinensis*	Greater coucal
29	Dicruridae	*Dicrurus leucophaeus*	Ashy drongo
30	Dicruridae	*Dicrurus macrocercus*	Black drongo
31	Estrildidae	*Lonchura punctulata*	Scaly breasted munia
32	Monarchidae	*Terpsiphone paradise*	Asian paradise Flycatcher
33	Motacillidae	*Anthus rufulus*	Paddyfield pipit
34	Motacillidae	*Motacilla maderaspatensis*	White browed wagtail
35	Muscicapidae	*Luscinia brunnea*	Indian blue robin
36	Muscicapidae	*Saxicoloides fulicata*	Indian robin
37	Nectariniidae	*Nectarinia zeylonica*	Purplr rumped sunbird
38	Nectariniidae	*Nectarinia asiatica*	Purple sunbird
39	Oriolidae	*Oriolus oriolus*	Eurtasian Golden oriole
40	Passeridae	*Passer domesticus*	House sparrow
41	Phalacrocoracidae	*Phalacrocorax niger*	Little cormorant
42	Phasianidae	*Pavo cristatus*	Indian peafowl
43	Picidae	*Dinopium benghalense*	Black rumped flameback
44	Podicipedidae	*Tachybaptus ruficollis*	Little grebe
45	Psittacidae	*Psittacula krameri*	Rose ringed parakeet

46	Pycnonotidae	*Pycnonotus cafer*	Red vented Bulbul
47	Rallidae	*Fulica atra*	Common coot
48	Rallidae	*Gallinula chloropus*	Common moorhen
49	Rallidae	*Amaurornis phoenicurus*	White breasted waterhen
50	Scolopacidae	*Actitis hypoleucos*	Common sandpiper
51	Sturnidae	*Acridotheres tristis*	Common myna
52	Threskiornithidae	*Pseudibis papillosa*	Black ibis
53	Threskiornithidae	*Threskiornis melanocephalus*	Oriental white ibis
54	Upupidae	*Upupa epops*	Common hoopea
55	Accipitridae	*Haliastur indus*	Brahminy kite
56	Cuculidae	*Cacomantis passerinus*	Indian plaintive cuckoo
57	Meropidae	*Merops philippinus*	Blue-tailed Bee-eater
58	Scolopacidae	*Limosa lapponica*	bar-tailed godwit
59	Ardeidae	*Nycticorax nycticorax*	Night Heron
60	Lybiidae	*Stactolaema olivacea*	Green barbet
61	Charadriidae	*Vanellus malabaricus*	Yellow-wattled lapwing

Table. 3. List of Birds in Chitrankudi and Kangerankulam Village pond, Ramanathapuram District

S.No	Family	Zoologycal Name	Common Name
01	Accipitridae	*Spilornis cheela*	Crested serpent eagle
02	Accipitridae	*Accipiter badius*	Shikra
03	Accipitridae	*Milvus migrans*	Black Kite
04	Alaudidae	*Mirafra cantillans*	Singing Bush Lark
05	Alcedinidae	*Alcedo atthis*	Common Kingfisher
06	Alcedinidae	*Halcyon smyrnensis*	White-breasted Kingfisher
07	Anatidae	*Anas crecca*	Common Teal
08	Anatidae	*Anas querquedula*	Garganey
09	Anhingidae	*Anhinga melanogaster*	Darter
10	Ardeidae	*Egretta garzetta*	Little Egret
11	Ardeidae	*Casmerodius albus*	Great Egret
12	Ardeidae	*Bubulcus ibis*	Cattle egret
13	Ardeidae	*Ardeola grayii*	Indian Pond-heron
14	Ardeidae	*Butorides striatus*	Striated heron
15	Ardeidae	*Ardea cinerea*	Grey heron
16	Ardeidae	*Dupetar flavicollis*	Black bittern
17	Burhinidae	*Esacus recurvirostris*	Great stone curlew
18	Ciconiidae	*Anastomus oscitans*	Asian Openbill
19	Ciconiidae	*Mycteria leucocephala*	Painted stork
20	Columbidae	*Streptopelia sengalensis*	Laughing Dove
21	Columbidae	*Columba livia*	Rock Pigeon
22	Columbidae	*Streptopelia chinensis*	Spotted Dove
23	Corvidae	*Corves splendens*	House Crow
24	Corvidae	*Corves macrorhynchos*	Jungle Crow
25	Corvidae	*Dentrocitta vagabunda*	Rufous treepie
26	Cuculidae	*Cuculus poliocephalus*	lesser cuckoo
27	Cuculidae	*Centropes sinensis*	Greater Coucal
28	Cuculidae	*Clamator jacobinus*	Pied Cuckoo
29	Dicruridae	*Dicrurus macrocercus*	Black Drongo
30	Dromadidae	*Dromas ardeola*	Crab plover
31	Monarchidae	*Terpsiphone paradise*	Asian Paradise Flycatcher
32	Motacillidae	*Motacilla maderaspatensis*	White-Browed Wagtail
33	Motacillidae	*Anthus rufulus*	Paddyfield Pipit
34	Muscicapidae	*Saxicoloides fulicata*	Indian Robin
35	Muscicapidae	*Luscinia brunnea*	Indian Blue Robin
36	Muscicapidae	*Copsychus saularis*	oriental magpie-robin
37	Nectariniidae	*Nectarinia asiatica*	Purple Sunbird
38	Nectariniidae	*Nectarinia zeylonica*	Purple-rumped Sunbird
39	Oriolidae	*Oriolus oriolus*	Eurasian Golden Oriole
40	Pandionidae	*Pandion haliaetus*	Osprey

41	Passeridae	*Passer domesticus*	House Sparrow
42	Phalacrocoracidae	*Phalacrocorax niger*	Little Cormorant
43	Phalacrocoracidae	*Phalacrocorax carbo*	Great cormorant
44	Phasianidae	*Pavo cristatus*	Indian Peafowl
45	Picidae	*Dinopium benghalense*	Black-Rumped Flameback
46	Podicipedidae	*Tachybaptus ruficollis*	Little Grebe
47	Psittacidae	*Psittacula krameri*	Rose-Ringed Parakeet
48	Pycnonotidae	*Pycnonotus cafer*	Red-Vented Bulbul
49	Rallidae	*Gallinula chloropus*	Common Moorhen
50	Rallidae	*Fulica atra*	Common Coot
51	Rallidae	*Amaurornis phoenicurus*	White-breasted Water hen
52	Scolopacidae	*Gallinago gallinago*	Common snipe
53	Scolopacidae	*Actitis hypoleucos*	Common sandpiper
54	Sturnidae	*Acridotheres tristis*	Common Myna
55	Threskiornithidae	*Threskiornis melanocephalus*	Oriental White Ibis
56	Threskiornithidae	*Pseudibis papillosa*	Black Ibis
57	Threskiornithidae	*Platalea leucorodia*	Eurasian Spoonbill
58	Threskiornithidae	*Plegadis falcinellus*	Glossy ibis
59	Turdidae	*Zoothera wardii*	Pied Thrush

ASSESSMENT OF BIORESOURCES AT VARIOUS LOCATIONS

THIAGARAJAR COLLEGE, MADURAI – 625 009

NATIONAL CENTRE OF EXCELLENCE IN STATISTICAL AND MATHEMATICAL MODELING ON BIORESOURCE MANAGEMENT

NATIONAL SCIENCE DAY LECTURE (25.02.2019)

Dr. D. Pandiaraja, Principal, delivering presidential address on National Science Day Lecture

Dr. Indira P. Sarethy, Associate Professor, Department of Biotechnology, JP Institute of IT, Noida delivering Science Day Lecture.

THIAGARAJAR COLLEGE, MADURAI – 625 009

NATIONAL CENTRE OF EXCELLENCE IN STATISTICAL AND MATHEMATICAL MODELING ON BIORESOURCE MANAGEMENT

INTERNATIONAL CONFERENCE ON RECENT TRENDS IN MATHEMATICAL & PHYSICAL MODELLING AND BIORESOURCE MANAGEMENT STRATEGIES (RTMPM&BRM - 2019) 12th & 13th February 2019

Thiru. Karumuttu T. Kannan, President, Thiagarajar College delivering Presidential address.
Dr. N. Srinivasan, Associate professor of Physics, Dr. Petri Piiroinen, School of Mathematics, National university of Ireland, Galway, Ireland, Thiru. Karumuttu K. Thiagarajar, Secretary, Thiagarajar college, Prof. M. Lakshmanan, Centre of Nonlinear Dynamics, Bharathidasan University, Trichirappalli, Dr. D. Pandiaraja, Principal and Director of NCoE, Thiagarajar College are on the stage.

Prof. M. Lakshmanan, Centre of Nonlinear Dynamics, Bharathidasan University, Trichirappalli, delivering Inaugural address.

THIAGARAJAR COLLEGE, MADURAI – 625 009

NATIONAL CENTRE OF EXCELLENCE IN STATISTICAL AND MATHEMATICAL MODELING ON BIORESOURCE MANAGEMENT

INTERNATIONAL CONFERENCE ON RECENT TRENDS IN MATHEMATICAL & PHYSICAL MODELLING AND BIORESOURCE MANAGEMENT STRATEGIES (RTMPM&BRM - 2019) 12th & 13th February 2019

Dr. Petri Piiroinen, School of Mathematics, National university of Ireland, Galway, Ireland, delivering Technical Lecture 2

Prof. S. Karuthapandian, Senior Professor & Head, Department of Biotechnology, Alagappa University, Karaikudi, Tamilnadu, delivering Technical Lecture 3

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NATIONAL CENTRE OF EXCELLENCE IN STATISTICAL AND MATHEMATICAL MODELING ON BIORESOURCE MANAGEMENT

INTERNATIONAL CONFERENCE ON RECENT TRENDS IN MATHEMATICAL & PHYSICAL MODELLING AND BIORESOURCE MANAGEMENT STRATEGIES (RTMPM&BRM - 2019) 12th & 13th February 2019

Prof. K.M. Gothandam, Dean, Schol of Bio Science and Technology, Vellore Institute of Technology, Vellore, Tamilnadu, delivering Technical Lecture 4

Valedictory function: Prof. M. Mathirajan, Chief Research Scientist & Faculty of Engineering, Department of Management Studies, IISc, Bangalore, Karnataka, India.

THIAGARAJAR COLLEGE, MADURAI – 625 009

NATIONAL CENTRE OF EXCELLENCE IN STATISTICAL AND MATHEMATICAL MODELING ON BIORESOURCE MANAGEMENT

ONE-DAY INTERNATIONAL SEMINAR ON WASTE MANAGEMENT (03.09.2018)

International seminar on Waste Management – Dr. D. Pandiaraja, Principal, Thiagarajar college and Director, NCoE briefing the theme of the Conference. Dr. Usha Mohan, Associate professor, IIT, Madras, Ms. N.S. Vishnu Priya, Business Entrepreneur, Novvo Craze & Trendz, Mumbai, Mrs. Uma Kannan, Vice Presedent, Thiagarajar college and Dr. Usha Ramanathan, Professor, Norttingham Trent University, United Kingdom are on the stage

Participants interacting with the Guest Speaker, Dr. Usha Ramanathan, Professor, Norttingham Trent University, United Kingdom

THIAGARAJAR COLLEGE, MADURAI – 625 009

NATIONAL CENTRE OF EXCELLENCE IN STATISTICAL AND MATHEMATICAL MODELING ON BIORESOURCE MANAGEMENT

ONE-DAY INTERNATIONAL SEMINAR ON WASTE MANAGEMENT (03.09.2018)

Participants interacting with the Guest Speaker, Ms. N.S. Vishnu Priya, Business Entrepreneur, Novvo Craze & Trendz, Mumbai. India

Participants interacting with the Guest Speaker, Dr. Usha Mohan, Associate professor, IIT, Madras

THIAGARAJAR COLLEGE, MADURAI – 625 009

NATIONAL CENTRE OF EXCELLENCE IN STATISTICAL AND MATHEMATICAL MODELING ON BIORESOURCE MANAGEMENT

NATIONAL CONFERENCE ON MATHEMATICAL MODELING AND BIORESOURCE MANAGEMENT (06.04.17 – 07.04.17)

National Conference on Mathematical Modelling and Bioresource Management – Dr. D. Pandiaraja, Director, NCoE briefing the theme of the Conference. Prof.Pradeep G Sidheshwar, Faculty of Mathematics and Director, Planning, Monitoring and Evaluation Board, Bangalore University, Er. K. Thiagarjan, Secretary and Dr. M. Eyini, Principal, Thiagarajar College are on the stage

Participants interacting with the Guest Speaker, Dr Mrs. N.R. Kamini, Principal Scientist, Head, Biochemistry & Biotechnology, CSIR - Central Leather Research Institute, Adyar, Chennai

II. TRAINING

TRAINING PROGRAMMES ORGANIZED

Training Programmes organized by the Centre participated by students of various institutions of Southern Tamilnadu		
Programme	**Dates**	**Participants**
Winter School on Bioresource assessment and IPR	28.11.18 to 03.12.18	UG & PG biology students
Winter School on Pharmacoinformatics	28.11.18 to 03.12.18	UG & PG biology students
Winter School on Bioprospecting and *Sui Generis*	28.11.18 to 03.12.18	UG & PG biology students
Winter School on Dynamical System	28.11.18 to 03.12.18	PG Mathematics
Winter School on Bioentrepreneurship and patenting	28.11.18 to 03.12.18	UG & PG biology students
UV-Vis Spectrophotometric techniques	08.09.18 & 09.09.18	UG & PG biology students
Forensic bioinformatics	08.09.18 & 09.09.18	UG & PG biology students
Hands on training on Lyophilization techniques	24.08.18	PG Biotechnology
Hands on training on Zebrafish (*Danio rerio*) model for research and drug development	22.05.18 & 23.05.18	PG Biotechnology
Hands on training on Chromatographic techniques	07.10.17 to 08.10.17	UG/PG Biology students
Hands on training on Basics of Bioinformatics	07.10.17 to 08.10.17	UG/PG Biology students
Winter School on Bio entrepreneurship and IPR	23.11.17 to 28.11.17	UG Biology students
Winter School on Molecular Techniques	23.11.17 to 28.11.17	UG/PG Biology students
Winter School on Bioinformatics and Drug Designing	23.11.17 to 28.11.17	PG Biology students
Winter School on Biostatistics and Mathematical Modelling	23.11.17 to 28.11.17	PG Biology and Mathematics students
Winter school on Statistics for biologists	21.11.16 to 26.11.16	PG biology students
Winter schools on Mathematical modelling on Bioresource management	21.11.16 to 26.11.16	PG Mathematics & Biology students
Winter school on Kinetics of marine microbial products	21.11.16 to 26.11.16	UG & PG biology students
Two day Workshop on UV-Vis Spectrophotometric techniques along with Department of Zoology	09.01.16 & 10.01.16	Selected undergraduate students from various institutions
Two day workshop on Multiplex ligation dependent probe amplification and its application in collaboration with Department of Zoology & BITS, Hyderabad Campus	21.12.15 & 22.12.15	PG Microbiology & Biotechnology

TRAINING PROGRAMMES ATTENDED BY STAFF, SCHOLARS & STUDENTS IN OTHER INSTITUTIONS:

Programme	Date	Participant(s)
Visit to Central Salt and Marine Chemicals Research Institute	29.08.18	M.Sc., Biotechnology students of the Centre
Hands on training on ELISA and Molecular methods at Viral Research and Diagnostic Laboratory (VRDL), Institute of Microbiology, Madurai Medical College.	05.04.18	M.M. Karthiga Devi, I. Nivetha K.V. Shalini Mai D. Uma Maheshwari MSc Biotech Students
Capacity Building workshop on Long-term monitoring of Himalayan Biodiversity for Stakeholders of Himalayan Region, Organized under the NMHS programme of MoEF & CC, Government of India Jointly by: Zoological Survey of India, Botanical Survey of India and G. B. Pant National Institute of Himalayan Environment & Sustainable Development held at ZSI-HARC, Solan, Himachal Pradesh	23.03.18 & 24.03.18	S. Muralikrishnan, Research Scholar
Annual Waterfowl count in Pong Dam Wildlife Sanctuary, District Kangra, Himachal Pradesh, Jointly organized by High Altitude Regional Center, Zoological Survey of India and Department of Forest, Himachal Pradesh held at ZSI-HARC, Solan, Himachal Pradesh	07.03.18 to 28.03.18	S. Muralikrishnan, Research Scholar
A Recent trends in Life Science Research with special reference to Moleclar Imaging, Proteomics and Metabolomics, Department of Animal Science, Bharathidasan University, Tiruchirappalli.	12.02.18 to 16.02.18	K. Marimuthu Research Scholar
Wildlife Conservation and Monitoring training Organized by Zoo Outreach Organization, Coimbatore, TN In collaboration with Society for Wildlife Interface and Forestry Training SWIFT, TN Forest Department, Coimbatore, VANAM, Theni Hosted by Tamil Nadu Forestry Training College, Sponsored by US Fish and Wildlife Serviceat Tamilnadu Forest Training College, Vaigai Dam	11.07.17 to 14.07.17	S. Muralikrishnan, Research Scholar as Resource person
Biaosafety and Viral Diagnostic Methods at Viral Research and Diagnostic Laboratory (VRDL), Institute of Microbiology, Madurai Medical College.	12.09.17 & 13.09.17	V. Meenakshi, V. Nagarani, M.Sc., Biotech students
Internship training in the Department of Human Genetics and Molecular Biology, Bharthiar University, Coimbatore	05.06.17 to 16.06.17	K. Arunkumar, N.R. Hemaa, V. Nagarani, M.Sc., Biotech students
National Workshop on Networking on Ecohistoric and cultural heritage of India, UBCHEA , Lady Doak College, Madurai	24.01.17 & 25.01.17	Dr. C. Balachandran & Dr. A. Surendran Faculty M.Sc., Biotechnology
DBT sponsored National Workshop on Recent trends in Molecular biology and bioinformatics,	05.01.17 to	G.B. Manikandan Technical assistance

Lady Doak College, Madurai	07.01.17	
National level workshop on genomic analysis and Protein designing using internet tools organized by Vivekananda College sponsored by Tamilnadu Science and Technology Centre, Chennai, Tamilnadu State Council for Science and Technology	06.10.16	Dr. C. Balachandran Faculty M.Sc., Biotechnology & 10 Students
TEQIP-II sponsored Short term training programme on Nonlinear analysis, computations using MATLAB, Mathematica, Maple, LINGO and Cplex with applications in engineering and sciences organized by Sardar Vallabhbhai National Institute of Technology, Surat	30.09.16 to 04.10.16	P. Nirvin Research Scholar
NAAC sponsored Benchmarks for excellence in teaching and evaluation, IQAC, Thiagarajar College,	01.04.16 & 02.04.16	S. Muralikrishnan, R.Rohini & P.Nirvin Research Scholars
Mathematica training program – GT Enterprises, Bangalore	25.02.16 & 26.02.16	Dr. D. Pandiaraja Director
UGC & DBT Sponsored National Seminar cum Workshop on Microbial Omics: From Genome to Proteome, Bioinformatics Infrastructural Facility, Department of Biotechnology, Alagappa University, Karaikudi	24.02.16 to 26.02.16	N. Saranya Faculty M.Sc., Biotechnology
International Workshop on Scholarly research publications: Writing, citations and Plagiarism, Periyar University	01.02.16	P. Nirvin, Project Fellow
Visit to Networking Resource Centre in Biological Sciences, Madurai Kamaraj University – DNA sequencing	17.02.16	I M.Sc., Biotechnology students of the Centre
Presented a review paper in an International conference on “Biodiversity and Evaluation (Perspectives and paradigm shifts)” held at Sree Sankara college, Kalady, Kerela,	02.12.15 & 03.12.15	N. Saranya, Faculty, M.Sc., Biotechnology
Five Day National Workshop on Modelling, stimulation and optimization of bioprocess organized by Department of Biotechnology, NIT, Warangal	02.11.15 to 06.11.15	P. Nirvin, Project Fellow
Plant Tissue Culture – GrowMore Biotech Ltd., Hosur	23.09.15	I M.Sc., Biotechnology students of the Centre
Pasteurization and milk products manufacturing – Aavin Milk Processing unit, Madurai	20.07.15	I M.Sc., Biotechnology students of the Centre
Operation and maintenance training – Shimadzu UV-1800 and AAS – 7000 conducted by Toshvin Analytical Pvt. Ltd.,	11.02.15	S. Muralikrishnan Research Scholar
State level workshop on Latex, Department of Mathematics, Saiva Banu Kshatriya College	07.03.15	P. Nirvin, Research Scholar

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WINTER SCHOOLS (23.11.18 – 28.11.18)

BIOENTREPRENEURSHIP AND IPR
MOLECULAR TECHNIQUES
BIOINFORMATICS AND DRUG DESIGNING
STATISTICAL AND MATHEMATICAL MODELLING

INAGURATION – Dr. D. PANDIARAJA, PRINCIPAL & DIRECTOR

INAUGRATION – Prof. R. UDHYAKUMAR, GANDHIGRAM RURAL INSTITUTE

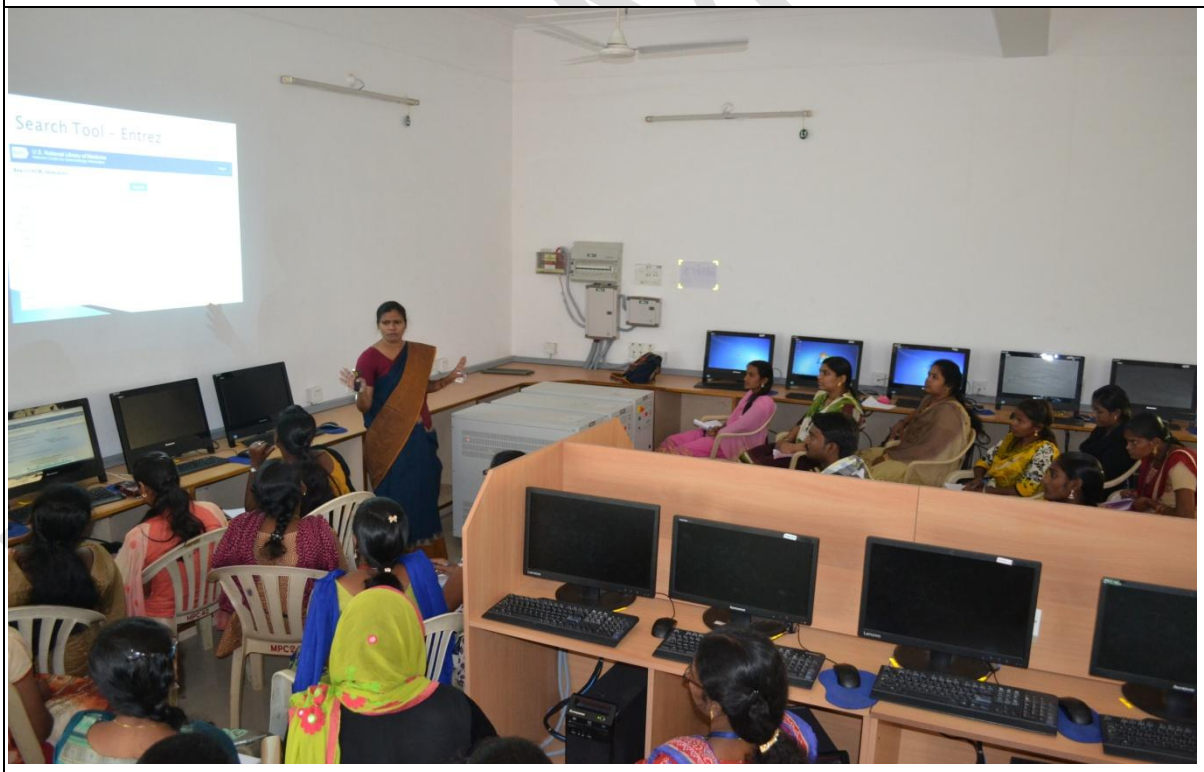
BIOENTREPRENEURSHIP & IPR – MUSHROOM PRODUCTION

BIOENTREPRENEURSHIP & IPR – VALUE ADDED PRODUCTS FROM MILK

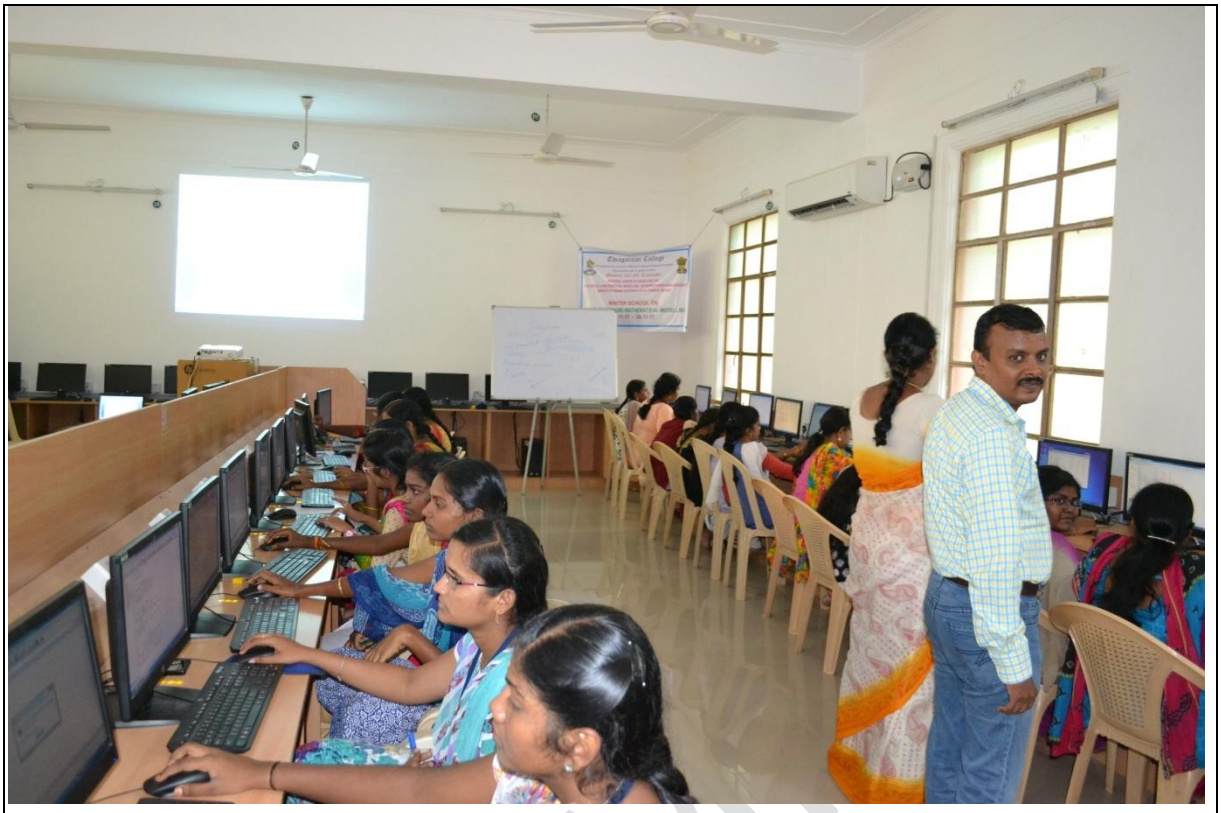
MOLECULAR TECHNIQUES – AGAROSE GEL ELECTROPHORESIS

MOLECULAR TECHNIQUES – DNA AMPLIFICATION BY PCR

BIOINFORMATICS & DRUG DESIGNING



BIOINFORMATICS & DRUG DESIGNING



BIOSTATISTICS & MATHEMATICAL MODELLING

BIOSTATISTICS & MATHEMATICAL MODELLING

VALEDICTORY FUNCTION – FEED BACK

VALEDICTORY FUNCTION – DISTRIBUTION OF CERTIFICATES

THIAGARAJAR COLLEGE, MADURAI – 625 009

NATIONAL CENTRE OF EXCELLENCE IN STATISTICAL AND MATHEMATICAL MODELING ON BIORESOURCE MANAGEMENT

HANDS ON TRAINING (07.10.18 & 08.10.18)

CHROMOTOGRAPHIC TECHNIQUES
BASIC TOOLS IN BIOINFORMATICS

INAUGURATION – Dr. D. PANDIARAJA, PRINCIPAL & DIRECTOR

INAUGURATION – Mr. S. KULANDAIVEL, COORDINATOR

CHROMATOGRAPHIC TECHNIQUES

CHROMATOGRAPHIC TECHNIQUES

BASIC TOOLS IN BIOINFORMATICS

BASIC TOOLS IN BIOINFORMATICS

VALEDICTORY FUNCTION – CERTIFICATE DISTRIBUTION

VALEDICTORY FUNCTION – PARTICIPANTS

THIAGARAJAR COLLEGE, MADURAI – 625 009

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WORKSHOP ON UV-Vis SPECTROPHOTOMETRIC TECHNIQUES AND FORENSIC BIOINFORMATICS (08.09.2018 & 09.09.2018)

Dr. M. Karthikeyan, Department of Bioinformatics, delivering lecture

Mr. S. Kulandaivel demonstrating UV spectrophotometer

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NATIONAL CENTRE OF EXCELLENCE IN STATISTICAL AND MATHEMATICAL MODELING ON BIORESOURCE MANAGEMENT

HANDS ON TRAINING (22.05.18 & 23.05.18)

ZEBRAFISH (*Danio rerio*) MODEL FOR RESEARCH AND DRUG DEVELOPMENT

Day 1

Lecture 1: Topic: Biology of zebrafish

A power point presentation was made detailing the physiological and taxonomical features of zebrafish. The presentation served as an eye-opener for acquiring the basic information and use of the fish as experimental animal.

Technical session 1:

Basic techniques of animal husbandry in rearing and maintaining zebrafish. A knowledge on the maintenance of various laboratorial parameters (physical & chemical) for the breeding and rearing of the fish was given.

Technical session 2:

The male and female zebrafishes were dissected separately. Vital organs such as brain, heart, intestine, kidney and reproductive system were viewed distinctly under dissection microscope.

Technical session 3:

An introduction to drug delivery techniques was given and the different strategies of drug deliverance such as oral delivery and intravenous were demonstrated and elucidated. The participants individually performed the techniques.

Day 2

Lecture 2: Experimentations and adaptations of zebrafish as animal model in Alzhemier's disease

A power point presentation was made illustrating the experimental applications of zebrafish as animal model for studying Alzhemier's disease. Various protocols involved in the induction of disease and their respective effects were discussed. Details of chemical analysis (Neurotransmitter - Dopamine) assay) and behavioral assays were explained. Further the participants were briefed to design

their own experimental setups using zebrafish as an animal model. An interactive session followed.

Technical session 4:

The collected eggs were exposed and imaged under dissection microscope. The participants distinctly identified the different stages of embryonic development of zebrafish.

Technical session 5:

Portions of brain and skin of female zebrafish were dissected and lysate was prepared for quantification of protein. The suspension was purified using HPLC and the students were trained to the handle the instrument.

Technical session 6:

Demonstration of Neuro behavioral animal models were performed using both male and female zebrafish. Behavioral assays such as novel tank and aggressive behavioral assays were demonstrated based on the velocity and positions of the fishes.

Blood collection techniques and serum isolation procedures were performed. The participants individually quantified and counted the blood cells using Haemocytometer.

THIAGARAJAR COLLEGE, MADURAI – 625 009

NATIONAL CENTRE OF EXCELLENCE IN STATISTICAL AND MATHEMATICAL MODELING ON BIORESOURCE MANAGEMENT

WINTER SCHOOLS (21.11.16 – 25.11.16)

STATISTICS FOR BIOLOGISTS
MATHEMATICAL MODELLING ON BIORESOURCE MANAGEMENT
KINETICS OF MARINE MICROBIAL PRODUCTS

Dr. J. Jeyakanthan, Professor & Head, Chairperson, Department of Bioinformatics, Algappa University, Karaikudi releasing the Winter School Manual. Dr. D. Pandiaraja, Director, NCoE, Dr. M. Eyini, Principal and Dr. Rm. Murugappan, Head, Dept. of Zoology and Microbiology & Dean, Curriculum Development, Thiagarajar College

Hands on training to participants of the Winter School Statistics for Biologists – working with software in the Ramanujam Computer Centre, Thiagarajar College

III. TEACHING

M.Sc., BIOTECHNOLOGY COURSE

- The Centre is supports M.Sc., Biotechnology Course from the academic year 2015 affiliated to Madurai Kamaraj University

- Introduction of Diploma in Quality Control in Biology from the academic year 2018

- Introduction of Diploma in Food Processing technology from the academic year of 2019

JC Bose Science Club:

Month	Name of the presenter	Topic
Aug 2018	K. Marimuthu, Research scholar Uma	Survey on Occupational health hazards of woman tea plantation workers of munnar Melanosome mimicking nano particles
Sep 2018	K. Sonaimuthu, Research scholar E. Subalakshmi K. V. Shalini Mai	Isolation, Characterization and Optimization of Amylase producing bacteria Lipase Enzyme production at Low temperature Entomopathogenic Fungi used control the mosquito-Overy
Jan 2019	V. Gayathri Devi	Isolation and Charaterization of bacteria from Tanery Effluent

Helix Science Club:

Month	Name of the presenter	Topic
Aug 2017	M. Subhashini R. Vasuupradha L. Anjali Devi E. Subalakshmi	Terrology Stem cells and its applications Secintific facts Biowar
Sep 2017	V. Nagarani V. Meenakshi M. Sukanya M. Elakkiya	Scientific connextions Science stroy about scientific inventions Scientific facts Scientific connextions
July 2018	R. Geetanjali L. Goutame J. Joselin Lydia S. A. Vishali	Organ on chips Biowar Lack of sleep, Tears Science facts, Lunar eclipse
Sep 2018	S. Farhana shereen L. Iswarya Devi	Secret behind foods Endangered species
Oct 2018	S. Anitha M. Anandhavalli	Recent research - skin gel Most expensive foods

Atal Innovation Club:

Month	Name of the presenter	Topic
Aug 2018	L. Anjali Devi M. Elakkiya	Mosquito control by using algae Albinism
Jan 2019	L. Anjali Devi J. Joselin Ludia L. Iswarya Devi R. Geethanjali P. Lavanya B. Keerthana Devi	Science innovative idea Science life hacks Science life hacks Cooking hacks, Traffic signal Hydrophobic shirt, Small specis Senstone

Biotech Literary Association:

Month	Name of the presenter	Topic
Sep 2018	P. Lavanya M. Anandhavalli L. Iswarya Devi P. Srinithi J. Joselin Lydia L. Anjali Devi	Science quotes Scientists overview Scientists overview Tamil kavithai Tamil kavithai Motivational stories
Oct 2018	I M.Sc., students	Scientific connection
Dec 2018	II M.Sc., students	Scientific photos and word puzzles

STUDENTS / STAFF PARTICIPATION IN VARIOUS ACTIVITIES

Programme	Date	Participant(s)
Participation in Zoofest – 2017 at Vivekananda College	18.12.18	06 students
Intercollegiate competition on Nurture our Nature, VVV College for Women, Virdhunagar	20.12.18	23 students
Inauguration of Science Club in the Centre – Presentation of lectures by students of Biotechnology	31.08.17	M.Sc., Biotechnology students
Inter collegiate Talent exposure, Dept. of Biotechnology & Biochemistry, JJ College of Arts & Scince, Pudukottai	08.09.17	04 students
One day Science Workshop on commemoration of National Science Day sponsored by IISER, Kerala at Yadhava College, Madurai	28.02.17	05 students
Intercollegiate Competition on Fauna – A treasure for our pleasure, VVV College for Women, Virudhunagar	10.02.17	04 students
Visit to Department of Biotechnology, Bharathidasan University, Trichirappalli	03.01.17	I M.Sc, Biotechnology students
Approaches to understand modern biology through research held at Aravind Medical Research Foundation, Madurai Seminar at Aravind Eye Hospital, Madurai	07.10.16	2 M.Sc students
National workshop on Genomic analysis and protein designing sponsored by Tamilnadu Science and	06.10.16	I & II MSc Biotechnology

Technology, Chennai, TNSCST and Tamilnadu Aruviyal Sangam, at Vivekananda College		students
State level intercollegiate meet – Microbes 2016, organized by Ayya Nadar Janaki Ammal College, Sivakasi	08.09.16	10 students of I MSc., Biotechnology students
Visit to Networking Resource Centre in Biological Sciences, Madurai Kamaraj University – DNA sequencing	17.02.16	I M.Sc., Biotechnology students
Multiplex liagation dependent probe amplification, Thiagarajar College, Madurai	21.12.15 to 22.12.15	12 students have participated
Colloquium – 2	19.12.15	Mrs. N. Saranya, Faculty and students of I M.Sc., Biotechnology students
Plant Tissue Culture – GrowMore Biotech Ltd., Hosur	23.09.15	I M.Sc., Biotechnology students of the Centre
State level students' Seminar, Thiagarajar College, Madurai	11.09.15	S. Pavithra & R. Sindhuja
Live healthy and live young – Guest lecture by Dr. K. Kanchana, MD., DGO.,	28.08.15	I M.Sc., Biotechnology students
Colloquium – 01	22.08.15	Capt. Dr. N. Arun Nagendran, Joint Director, Dr.T.S. Ramya –Lakshmi, Mrs. N. Saranya, Faculty and students of I M.Sc., Biotechnology students
Pasteurization and milk products manufacturing – Aavin Milk Processing unit, Madurai	20.07.15	I M.Sc., Biotechnology students of the Centre

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M.Sc BIOTECHNOLOGY

AAVIN, MADURAI (20th JULY, 2015)

Our 1st industrial visit was carried out at Aavin, Madurai on 20th July, 2015 for 1st year M.Sc., Biotechnology and 2nd year M.Sc., Microbiology students along with 3 staff members (Mr.S.Kulandaivel, Lecturer in M.Sc., Microbiology, Mrs.N.Saranya, Lecturer in M.Sc., Biotechnology and Mr.A.Muthuvazhivittan, Lab Assistant). We reached Madurai Aavin at 10.30 am. We were received by the staff at Madurai Aavin and we were taken for a visit inside the factory. The main objective of this visirt was to make the students understand about the procurement, processing which include quality checking and distribution of milk and the milk products to the customers.

First, they explained about the procurement of raw milk from different villages. The procured raw milk was chilled at 4°C in the transporting vehicle till it reaches the dairy factory. Then, the procured raw milk was sent for quality checking. The raw milk was subjected to Methylene Blue Reduction Test (MBRT) for checking its quality and some microbiological test was also done for checking the same. The fat content was also checked. After the quality check, the raw milk underwent homogenization process. After that it was sent for pasteurIzation. Inorder to kill the microorganisms, pasteurization was carried out. The milk was heated to 71°C for 15-30 seconds and then it was cooled quickly to 4°C.

Then this pasteurized milk was stored in large milk storage tanks. They have cream seperators too where they separate skim milk and cream. Then they explained how the milk powder was made. When there is excess milk, it was used to prepare milk powder. Here they preheat the milk between 70 to 100°C and then the milk was passed through the evaporator and it was sprayed into a heated chamber where they give 150 to 170°C by which the water in milk was removed. Through this process they prepare milk powder.

Aavin manufactures and markets ISI quality skimmed milk powder in 500 gms carton and 1 kg polypack. Then they add required amount of powder to the milk according to the fat content. Then the processed milk was again quality checked and the fat content was tested. After testing, the milk was packed according to the fat content in green, blue and orange coloured packets. The milk was then stored in the chilled room until it gets dispatched. The cans, storage tanks, cold rooms were checked at regular interval of time.

The visit was so informative. It is rightly said “see and know” is better than “read and learn”. We staff members and students thank our college secretary, principal, director and joint director who gave us permission and their support to make this industrial visit a successful one.

THIAGARAJAR COLLEGE, MADURAI – 625 009

NATIONAL CENTRE OF EXCELLENCE IN STATISTICAL AND MATHEMATICAL MODELING ON BIORESOURCE MANAGEMENT

M.Sc BIOTECHNOLOGY

GROWMORE BIO-TECH LTD, HOSUR (23rd SEPTEMBER, 2015)

On receiving permission from Growmore Bio-tech ltd, one of the leading biotech company, recognized by Department of Biotechnology and certified under National Certification System for Tissue Culture Plants located at SIPCOT phase 2, Hosur. I year M.Sc., Biotechnology students were taken for the visit along with 3 staff members (Mrs.N.Saranya, Lecturer in M.Sc., Biotechnology, Mr.Muthuvazhivittan, Lab Assistant, Mr.Murali Krishnan, Research scholar). We reached the company on 23rd september 2015 at 10:30 pm.

We were received by Mr.Paneer Selvam, Project Coordinator, Growmore Bio-tech ltd. He gave us a brief introduction about the company. They have developed propogation technology for over 65 different plant species. They have conducted so many biotechnology research and plant breeding in bamboo under the leadership of the director Dr.N.Barathi. He was the one who cloned a unique variety of a bamboo and named it as “Beema Bamboo”. The name “Beema” was for its unique inherent characteristics.

He developed “Beema Bamboo” from the open pollinated population of bamboo found in West Bengal. He found some morphological characteristics of “Beema Bamboo” to be different from the other varieties of bamboo. “Beema Bamboo” was found to be non-flowering, thornless, thick walled, high biomass and fast growing. As this variety of bamboo is non-flowering and thornless, replanting is not necessary and it is comfortable for harvesting. It needs only 2 feet soil depth to grow and can be grown on any type of soil. The major ecological importance of “Beema Bamboo” is “Carbon Sequestration”. The project coordinator explained that this variety of bamboo has the capability of taking 400 kg of carbon dioxide per year and it can release 320 kg of oxygen per year which is more than the human requirement of oxygen. So, ultimately where there is bamboo plant, the place becomes carbon neutral and it have fibrous root system, so it will not cause any damage to the buildings or compound walls when planted. “Beema Bamboo” was found to be very ideal for the generation of electricity. 1 acre of bamboo produces sufficient biomass to produce 45MW of electricity through gasification method. 12 – 15,000 lts of ethanol can be extracted from this bamboo.

With these entire brief introductions about “Beema Bamboo”, he took us to their laboratory where he showed how the plants were cloned. They clone about 1 lakh plants per day. Firstly, we were taken to the media room where they prepare media for the growth of plants. In the media room, a specially designed autoclave was shown with double doors for reducing contamination. They check for contamination after autoclaving too. We were then taken to the micropropogation room. He showed how the micropropogation works were carried out. They too have separate place for the plants to obtain natural light to carry out photosynthesis. The plants were carefully cultured at the laboratory condition in a culture bottle till 18 months. After each step, they carefully check the media in which the plants grow for contamination.

After 18 months, they take the plants out from the culture bottle and they thoroughly clean the medium in the roots of the plant in running water and they subject the plants to primary hardening. Before primary hardening, while they clean, they first separate the plants according to the size. Coir pith was used for primary hardening and its electrical conductivity was reduced to less than 2. This is required for growing the cultured plants. After 4 weeks, they again transfer the plants to the polybag for exporting it to different countries. They too have nurseries where they grow different varieties of plants under optimum temperature and humidity. Other than bamboo they clone various medicinal plants and ornamental plants.

The visit was so informative and interesting. We left the premises around 1:15pm. From this visit, the students were able to learn the techniques involved in plant tissue culture and they learnt about the uses of various plants especially “Beema Bamboo”. We staff members and students thank our college secretary, principal, director and joint director who gave us permission and their support to make this industrial visit a successful one.

THIAGARAJAR COLLEGE, MADURAI – 625 009

NATIONAL CENTRE OF EXCELLENCE IN STATISTICAL AND MATHEMATICAL MODELING ON BIORESOURCE MANAGEMENT

M.Sc BIOTECHNOLOGY

Field visit to Kerala agricultural university

At Kerala agricultural university we were given **lecture on Hydroponics, Plant tissue culture techniques and Food processing lab**

Food processing lab at Research station, Kerala Agriculture University in Wayanad.

Hydroponics lab

THIAGARAJAR COLLEGE, MADURAI – 625 009

NATIONAL CENTRE OF EXCELLENCE IN STATISTICAL AND MATHEMATICAL MODELING ON BIORESOURCE MANAGEMENT

M.Sc BIOTECHNOLOGY

RURAL AND ENTREPRENEURIAL BIOTECHNOLOGY (MUSHROOM CULTURE, SERICULTURE & VERMICULTURE) TRAINING AT VIVEKANANDA COLLEGE – 04.01.18

Observation of different species of silkworm Then we had the opportunity to gain the knowledge about sericulture processing where different species of silkworm such as muga and ori were shown with their lifecycle, culture conditions, disease affecting and entrepreneur properties.

Then, we had a visit to the mushroom cultivation farm where we saw the cultivation of oyster mushrooms. There we gained step by step knowledge about the straw preparation, seedling of span about the mushroom cultivation. This information will guide us to cultivate the mushroom even at home which may help us to become an entrepreneur.

We visited the vermicompost unit where the organic waste materials produced inside the campus were recycled by earthworms which may helps us to earn high income using waste materials.

We had a chance to know the information about dairy farm and its maintenance where there are more than 100 cows including young once, calves and milk yielding cows which were kept in separate compartments and thus become easy to maintain them.

On the whole approximately 500 liters of milk were collected and used for college catering purpose and also for outside sale. Paddy straws were collected from their own agricultural fields, chopped with machineries and given as fodder for calves.

All the cows were provided hospitality with highly sophisticated methods. They were maintained by tail to tail contact to avoid any uncomfortable behavior among them. The cow dung produced by the dairy industry were utilized by the vermicomposting unit for organic manure preparations.