Centre of Advanced Faculty Training
AGRICULTURE MICROBIOLOGY
Tamil Nadu Agricultural University, Coimbatore

Introduction

This Microbiology unit of the Department of Biology had its origin in 1971 and grown as Department of Agricultural Microbiology during 1979. Since inception the department is concentrating on teaching, research and extension activities. The priority research areas are biological nitrogen fixation, waste recycling, food microbiology, industrial microbiology, microbial genetics and mass production and quality control of bioinoculants. Master's and doctoral programmes in Agricultural Microbiology was started in 1979 and so far 252 M.Sc.(Ag.) and 95 Ph.D. students have graduated. The faculties of the department are well recognized in various national and international scientific bodies and their findings have been patented. The department was recognized as Centre for Advanced Studies in Agricultural Microbiology by UNDP/ FAO/ ICAR during 1979 to 1986 and 1995 till date. In XI plan also, ICAR has continued the recognition of this department as centre of Advanced Faculty Training in Agricultural Microbiology. The department has released novel strains of biofertilizers for various crops and soils and is pioneer in deducing novel strains for K, Zn and Mn solubilization and hence is recognized as Nodal agency for bioinoculants in Tamilnadu and authorized for quality check of agricultural bioinoculants. The recent research focus of the department is in the areas of bioprocessing, fermentation of vegetables, climate change impact on microbial diversity and biofuels.

Objectives of CAFT

- To offer training to scientists and faculty members of State Agricultural Universities and Central Institutes.
- To strengthen the research activities in the important areas of Agricultural Microbiology.
- To upgrade the research and teaching facilities in Agricultural Microbiology.
- To strengthen the UG and PG programmes in Agricultural Microbiology

Faculty as on 30-09-2011

A. Faculty members

Name	Designation
Dr. K. Kumar	Professor & Head
Dr. M. Thangaraju	Professor (Ag. Micro)
Dr. R. Narayanan	Professor (Ag. Micro)
Dr. S. Gunasekaran	Professor (Ag. Micro)
Dr. R. Murugesan	Professor (Ag. Micro)
Dr. P. Marimuthu	Professor (Ag. Micro)
Dr. G. Gopalaswamy	Professor (Ag. Micro)
Dr. K. Ilamurugu	Professor (Ag. Micro)
Dr. K. VIjila	Professor (Ag. Micro)
Dr. G. Prasad	Professor (Ag. Micro)
Dr. K. Kumutha	Assoc. Professor (Ag. Micro)
Dr. V. Gomathy	Assoc. Professor (Ag. Micro)
Dr. H. Gopal	Assoc. Professor (Ag. Micro)
Dr. U. Sivakumar	Assoc. Professor (Ag. Micro)
Dr. S. Karthikeyan	Assoc. Professor (Ag. Micro)
Dr. D. Balachandar	Assoc. Professor (Ag. Micro)
Dr. M. Senthilkumar	Asst. Professor (Ag. Micro)
Dr. M. Gnanachithra	Asst. Professor (Ag. Micro)
Dr. R. Subhashini	Asst. Professor (Ag. Micro)
Dr. R. Brindavathy	Asst. Professor (Ag. Micro)

Human Resource Development

S No.	Year	Name of the programme	Period		Participants		
			From	To	Internal	External	Total
1.	2007 – 08	Microbial products and their application in food processing	21.01.08	10.02.08	2	13	15
2.	2007 – 08	Techniques in soil microbiology with emphasis on anaerobes	09.02.08	29.02.08	4	10	14
3.	2008 – 09	Screening and isolation of anti-microbial compounds against plant disease	02.11.08	23.11.08	2	14	16
4.	2008 – 09	Bio-fuels from multiple feed stocks	11.03.09	31.03.09	4	12	16
5.	2009 – 10	Mycorrhizal systems for sustainable agriculture horticulture and forestry	11.03.10	31.03.10	3	11	14
6.	2010 - 11	Current Perspectives in Molecular Microbial Diversity	03-2-11	23-3-11	4	12	16

7	2011-12	Microbial Processes for Value Addition in food and Beverages.	01-02-2012	21-02-2012			13

6. Infrastructure development (Equipments) : **NIL**

7. Renovation of lecture room / laboratories :

- An air conditioned modern lecture hall with LCD Projectors, Computer with Internet facilities, Public address systems, TV and DVD players has been developed
- Laboratories have been upgraded for carrying out quality research in leak proof, dust free and researcher friendly environment
- A library containing about 500 books with photocopier and browsing facilities for trainees students and staff has been established under ICAR CAS/CAFT programme at the Department of Agrl. Microbiology, TNAU, Coimbatore.

8. Publications :

A. International

Balachandar, D., Raja, P. and Sundaram, SP. 2008 Genetic and Metabolic Diversity of Pink Pigmented Facultative *Methylobacterium* in Phyllosphere of tropical plants. *Brazilan Journal of Microbiology,* **39**: 68-73.

Balachandar D, Raja, P., Nirmala, K.R., Rethyl, T. and Sundaram, SP. 2008. Impact of transgenic Bt-cotton on the diversity of pink-pigmented facultative methylotrophs. *World Journal of Microbiology and Biotechnology,* **24**: 2087-2095.

Chinnadurai, C, Balachandar. D. and Sundaram, Sp. 2009. Characterization of 1-aminocyclopropane-1-carboxylate deaminase producing methylobacteria from phyllosphere of rice and their role in ethylene regulation. *World Journal of Microbiology and Biotechnology,* **25**:1573-0972

Krishnamoorthy, R., Narayanan, R., Vijila, R. and Kumutha, K. 2010. Intergeneric protoplast fusion of yeast for high ethanol production from cheese industry waste –whey. *Journal of Yeast and Fungal Research,* **1**: 81-87.

Angeline Shimly, T.R., Sridhar, R. and Logeshwaran, P. 2009. Isolation of *Bifidobacterium* from infant faeces and its characterization. *Journal of Pure and Applied Microbiology,* **3**: 535 – 542.

Raja, P., Balachandar, D. and Sundaram, SP. 2008. Diversity of pink-pigmented facultative methylotrophic bacteria in the phyllosphere of tropical crop plants*. Biology and Fertility of Soils* **45**: 45-53.

B. National

Balachandar, D., Karthikeyan, S., Kumar, K. and Chendrayan, K. 2010. Improved diagnostic techniques for quality control of biofertilizers. *Biofertertilizer Newletter,* **18**:3-8.

Bharathi. J., Kumar, K. and Prabhakaran, J. 2010. Role of Azophos inoculation in the root morphogenesis of drought tolerant rice varieties. *Advances in Applied Research*, **2**:59 – 62.

Devikrishna, S., Kumutha, K., Santhanakrishnan, P. and Srimathi Priya, L. 2010. Standardization of Process for hairy root production using *Agrobacterium rhizogenes* for monoxenic culture of arbuscular mycorrhizal fungi. *Indian Journal of Agricultural Science,* **80**: 993-997.

Gopal, H. 2010. Influence of rhizobacterial inoculation on the growth particulars of asvagantha. *Asian Journal of Biological Science,* **5**:117-121.

Gopal, H. and Kumutha, K. 2010. Effect of rhizobacterial inoculation on withaferin-a content of asvagantha [var Jawahar] roots. *Asian Journal of Biological Science,* 5: 69 -72.

Gopal, H. and Natarajan, T. 2010. Microbial inoculants for enhancing the biochemical properties of *Withania somnifera* variety Jawahar 20. *Madras Agricultural Journal,* **96**:339-343.

Jeberlin Prabina, B. and Kumar, K. 2010. Dried *Azolla* as a nutritionally rich cost effective and Immunomodulatory feed supplement for broiler. *The Asian Journal of Animal Sciences,* **5**:20-22.

Jeberlin Prabina, B. and Kumar, K. 2010. Studies on the optimization of cultural conditions for maximum hydrogen production by selected Cyanobacteria. *Journal of Agricultural and Biological Sciences,* **5**:22-31.

Jeya Bharathi, M., Kumar, K. and Prabakaran, J. 2010. Role of Azophos inoculation in the root morphogenesis of drought tolerant rice varieties. *Advances in Applied Research,* **2**:59 –62.

Poorniammal, R., Sundaram, SP., and Kumutha, K. 2009. *In vitro* Biocontrol activity of *Methylobacterium extorquens* against fungal pathogens. *Asian Journal of Bioscience*, **2**: 59-62.

Poorniammal, R., Sundaram, SP., Kumutha, K. and Parimala Devi, R. 2009. Comparitive efficacy of cocultured inoculants (Azophosmet) over individual inoculants of cotton under *in vitro* and *in vivo* conditions. *Asian Journal of Bioscience*, **4**:10-14.

Poorniammal, R., Sundaram, SP., Kumutha, K. and Parimala Devi, R. 2009. Standardization of media for co-culturing of *Azospirillum* Phosphobacteria and *Methylobacterium*. *Asian Journal of Bioscience*, 4:38-43.

Raja, P., Balachandar, D. and SSundaram, SP. 2008. Fingerprinting of plant associated pink-pigmented methylobacteria*. Indian Journal of Biotechnology,* **7:** 508-514

Sarathambal, C., Tangaraju, M., Paulraj, C. and Gomathy, M. 2010. Assessing the zinc solubilization ability of *Gluconacetobacter diazotrophicus* in maize rhizosphere using labeled ^{65}Zn compounds. *Indian Journal of Microbiology,* **50**:S13.

Sivakumar, U., Karthikeyan, S. and Sabarinathan, K.G., 2010. Gibberellic acid production by *Fusarium fujikuroi* SG2. *Journal of Scientific and Industrial Research,* **69**: 211-214.

Srimathi Priya, L. and Kumutha, K. 2009. Effect on AM inoculation on enzyme activities and microbial population in the rhizosphere of Coleus forskohlii. *Mycorrhiza News,* **20**: 14-21

Srimathi Priya. L and Kumutha, K. 2010. Growth and alkaloid yield of *Coleus forskohlii* with the inoculation of AM fungi and PGPR. Mycorrhiza News, **21**: 24-29.

Suchithra, R., Kumutha, K. and Balachandar, D. 2010. Morpho-typing and molecular diversity of arbuscular mycorrhizal fungi in sub-tropical soils of Coimbatore region, Tamil Nadu, India. Indian Journal of Microbiology. Online Published. [DOI 10.1007/s12088-011-0206-2].

Vijayakumar, K., Kumutha, K., Santhanakrishnan, P. and Gopal, H. 2010. Glucose utilization and lipid production by oleaginous yeast cultures. *Asian Journal of Biological Science,* **5**: 49-53.

Vijayakumar, K., Kumutha, K., Santhanakrishnan, P. and Gopal, H. 2010. Influence of nitrogen on lipid and biomass production by oleaginous yeast cultures. *Asian Journal of Biological Science,* **5**: 87-91.

C. Book chapters

Prasad. R., R. Narayanan, R. Malla, P. K. Sharma, U.S. bagde and A. Varma. 2009. The RNA world. In: Textbook of Molecular Biotechnology (eds. Chauhan A. K and Varma. A) IK International – India. Pp. 273 – 286.

D. Manuals

Vijila, K. and Sridhar, R. 2008. Microbial products and their application in food processing, Tamil Nadu Agric. Univ., Coimbatore.

Ilamurugu, K. and Chendrayan, K. 2008. Techniques in soil microbiology with emphasis on anaerobes. Tamil Nadu Agric. Univ., Coimbatore.

Gopalaswamy, G. 2009. Screening and isolation of anti-microbial compounds against plant disease. Tamil Nadu Agric. Univ., Coimbatore.

Marimuthu, P., Gunasekara, S. and K. Kumar. 2009. Bio-fuels from multiple feed stocks. Tamil Nadu Agric. Univ., Coimbatore.

Kumutha, K. and Narayanan, R., 2010. Mycorrhizal systems for sustainable agriculture horticulture and forestry. Tamil Nadu Agric. Univ., Coimbatore.

Balachandar, D., Karthikeyan, S., Kumar, K., Thangaraju, M., and Prabakaran, J. 2011. Current Perspectives in Molecular Microbial Diversity, Tamil Nadu Agric. Univ., Coimbatore.

Financial statement :

Expenditure under CAFT during XI Plan:

Head	2007-08	2008-09	2009-10	2010-11	2011-12
Operating cost of Training	3,54,000	3,54,000	1,67,100	1,67,100	3,74,738
Cost of personnel	1,41,113	1,91,217	1,68,424	1,68,424	1,90,125
Recurring contingencies	1,99,867	1,89,785	1,45,206	1,41,306	2,00,510
Non-recurring contingencies	-	-	-	-	-
TA	26,620	17,151	12,950	12,950	15,410
Library	50,000	50,000	30,000	30,000	30,000
TOTAL	**7,71,600**	**8,02,153**	**5,23,680**	**5,19,780**	**8,10,783**