FACULTY PROFILE

DR. JAYACHANDRAN.K

Professor, School of Biosciences

Mahatma Gandhi University, Kottayam, Mobile: 09446356612

Email: jayansbs@gmail.com.

1. **Qualifications-**M.Sc., PhD in Biotechnology (CUSAT), CSIR, GATE 94%
2. **Field of interest-** Bioprocess Technology
3. **Teaching / Research experience –** 19years
4. **PhD awarded - 8, Ongoing-** 6
5. **M.Phil/MSc thesis Guided – 22;** 14/8
6. **Publications -31 International 24 and 7 national.**

In Scientific Magazine -1. Book Chapters – 2

7. **Seminars/Workshops/Invited lectures**

i) In Seminars /Symposia/ Conference/workshop -17 ii) Invited lectures -16

ADMINISTRATIVE EXPERIENCE

* Presently holding the additional charge of Director, College Development Council, M.G.University since November , 2016

*Has been acting as the Honorary Director of Interuniversity centre for the studies in science of Music (IUCSSM) since November 2015

MEMBER IN STATUTORY BODIES

*Former Senate Member M.G.University 2010-2014

ACADEMIC ACHIEVEMENTS

1. TOPIC OF RESEARCH – BIOPROCESS TECHNOLOGY

We have been concentrating our research on biodegradation of organic compounds for the last few years. We could standardize the basic strategies of biodegradation of various organic molecules in our lab. We started our research work with phenol biodegradation and could publish many international publications and an international review in phenol biodegradation **(Nair and Shashidhar, 2004; Nair *et al* 2007**; **Nair** *et al* **2008; Nair *et al* 2009)**. We could successfully apply this strategy in the effective treatment of Newsprint factory effluent. We could isolate a natural rubber latex degrading *Bacillus pantothenticus* from latex contaminated soil **(Elizabeth and Jayachandran, 2010).** We could also apply this isolate in the treatment of natural rubber latex centrifugation effluent **(Elizabeth and Jayachandran, 2010)** We have also one international publication on cellulose biodegradation **(Joseph Job *et al* 2010**).Presently we are concentrating on the isolation of phenol degrading bacteria from soil by using suitable molecular techniques, phylogenetic tree construction and isolation and purification of catechol-2,3 dioxygenase enzyme.The present work also includes investigation in the metabolomics of phenol biodegradation along with the research on the possible role of Quorum sensing in biodegradation.

2. PhD PROGRAMME GUIDED/GUIDING

Awarded

1.Dr Annie J Mathew :- invitro culture and secondary metabolite production in Scoparia dulcis linn.2009

2.Dr Elizabeth Cherian :-Microbial degradation of natural rubber latex and its application in the treatment of latex centrifugation effluent.2010

3.DrSeba George : Microbial production of biosurfactants 2012

4.Dr Joseph Job :- Beta glucosidase production from Paelomycesvariotti through solid state fermentation 2012

5.DrAmith Abraham :- Evaluation of antagonistic potential of a bacterial endo-symbiont against Phytophthorameadii causing abnormal leaf fall disease of rubber(Haveabrasiliensis) 2014

6. Dr Sajudeen P.A :- A study on Pamba river pollution and its treatment strategies 2015

7. Dr.Dhanya .V :- Microbial consortia development for the biodegradation of mixed organic compound.2016

8.Dr.Merlin Antony :- Acyl homoserine lactone based quorem sensing and its biotechnological applications.2017

On-Going

1. SheetalSivankutty :- Acetyl homoserine lactone based quorem sensing in gram negative bacterial

2. MohammedAshiq S:- Microbial degradation of aniline and its application in the biological treatment of industrial effluents.

3. .Anoop.M :- Metabolite Profiling in the microbial degradation of phenol

4.Indu M Nair :- Squalene cyclises from endophytes of selected medicinal plants.

5.PadijarakavilSoumya :- Production of bacterial esterases from soil and its characteristics.

6.Rakhie Mol Nanonutrients for invitroculture of *Scoparia dulcis* (Just joined)

3.PROJECT UNDERTAKEN-

AS PI

1. Major Project (9.06 Lakhs) from UGC Safety Evaluation of the process of Chlorination in drinking water system with specific reference to Chlorination derived Byproducts.-UGC Major project (completed).

2.BIRD-Project-Extension programme- funded by Kerala State Council for science, Technology and Environment (KSCSTE) for an amount of Rs.1.1 lakh (2011 – 2012) completed.

3.YIPB Project funded by KBC, Kerala State Council for science, Technology and Environment (KSCSTE) for an amount of Rs. 16.4 lakhs (2012 – 2015) completed

4. Student project, KSCSTE 2014,Rs.10,000/- (completed)

5 .Back to lab programme Kerala State Council for science, Technology and Environment (KSCSTE) for an amount of Rs. 6.9 lakhs (2015-2017) ongoing

AS Co PI

1. Co-Investigator of KSCSTE- SARD "Infrastructure Development for Applied Life Sciences Research (IDAL) support to School of Biosciences", Mahatma Gandhi University, Order no: 68/2015/KSCSTE, Thiruvananthapuram. **KSCSTE**, Govt. of Kerala.

2. Co-Investigator (Project submitted) Applicability of nano-scale substrate for enhanced camptothecin production from fungi and widening the camptothecin bioactivity by its conversion to nanoconjugates. Project submitted to **CSIR**, Govt. of India.

3. Co-Investigator (Project submitted) Multi- beneficial applicability of nanochitin as cost effective material for delivery and induction of plant growth promoting rhizobacteria and as modulator of plant immune responses, Project submitted to **DBT**, Govt. of India.

4. SEMINARS CONDUCTED –Convener of the National seminar " Recent trends in Applied Life Sciences(NSALS) conducted at School of Biosciences , M.G.University, Kottayam from 15 -16 th March 2017

5. LIST OF PUBLICATIONS

1. "A novel *Acinetobacter* sp. for treating highly acidic rubber latex centrifugation effluent". **Jayachandran, K.,** Suresh, P. V. and Chandrasekaran, M (1994). *Biotechnology Letters*, 16: 649-654. **U.K. Impact factor 1.22**

2. "Biological coagulation of skim latex using *Acinetobacter* sp isolated from natural rubber latex centrifugation effluent." **Jayachandran, K** and Chandrasekaran. M. (1998). *Biotechnology Letters*, 20: 161-165. **U.K. Impact factor1.22**

3. "Treatment of dairy waste water using a selected bacterial isolate *Alcaligenes* sp MMRR7". K. Rajeshkumar and **Jayachandran K** (2004). *Applied Biochemistry and Biotechnology*, 118, 65-72.**UK.Impact factor 1.7**

4. "Effect of an antimicrobial ayurvedic compound *Kaishoragugguluvadakam* in the micropropagation of *Scoparia dulcis*." Annie J. Mathew and **Jayachandran, K** (2005). *Asian Journal of Microbiology, Biotechnology and Environmental Sciences*, 7 (2): 311-314.

5. "Production and purification of extracellular exoacting inulinase from a novel bacterial strain". Amit Abraham and **K. Jayachandran** (2007). *Research Journal of Biotechnology*, 2, 45-49.1.
6. Rapid propagation of Scoparia dulcis Linn. Annie J. Mathew and K.Jayachandran (2008). Research Journal of Biotechnology, 3(2), 31-35.
7. Endophytic *Penicillium citrinum* Thom.From *Scoparia dulcis* Linn. Annie J Mathew, **Jayachandran K** (2010). and Jyothis Mathew. Indian Journal of Microbiology, 50(1),99-102. (Springer)
8. "Treatment of phenol containing paper factory effluent with immobilized cells of phenol degrading *Alcaligenes* sp." Indu C Nair**, . Jayachandran K** and Shankar Shashidhar (2007). *Bioresource Technology,* 98,714-716.Elsevier, **USA Impact factor 4.5**
9. "Production of rhamnolipid biosurfactant from *Pseudomonas aeruginosa* MTCC 2297 by Submerged fermentation using orange fruit peelings as sole carbon source' Sheba George and **Jayachandran K** (2009). Applied Biochemistry and Biotechnology, 158,694-705. Springer. **USA Impact factor 1.7**
10. Accumulation of intracellular Polyhydroxybutyrate in *Alcaligenes* sp d_2 under phenol stress. Indu C Nair, Pradeep S, Ajayan M S, **Jayachandran. K** and Shankar Shashidhar (2009). Applied Biochemistry and Biotechnology,159, 2, 545-552. Springer. **USA Impact factor 1.7**
11. Production of scopadulcic acid B from Scoparia dulcis using luffa sponge immobilized bioreactor. Annie J Mathew and **Jayachandran, K (**2009). Plant, tissue and organ culture, 98,197-203, Springer, Netherlands, **Impact factor, 1.06**
12. Production of highly glucose tolerant beta glucosidase by Paecilomyces variotii MG3; optimization of fermentation conditions using Plackett-Burman and Box-Behnken experimental designs. Joseph Job, Rajeev K Sukumaran, **Jayachandran K (**2010). World Journal of Microbiology and Biotechnology, 26, 1385-1391. (Springer) Impact Factor-1.5
13. Microbial degradation of natural rubber latex by a newly isolated *Bacillus Pantothenticus* isolated from soil. Elizabeth Cherian, and **Jayachandran K,** (2010).International journal of Environmental Research.3, 4,599-604., Impact Factor-0.5
14. Biological treatment of natural rubber latex centrifugation effluent using activated sludge system enriched with Bacillus sp. SBS25.Elizabeth Cherian, and

Jayachandran K, (2010). International Journal of Environmental Studies, 67,5,725-733,.

15. A novel exploitable feature of "*Chromobacterium violaceum*" –experimentaql evidence for phenol degradation. Sreeja Narayanan, Tintu Prasad, Indu C Nair and **Jayachandran.K** (2012). Novus International Journal of Biotechnology and Bioscience, 1(3),
16. *In vitro* propagation and vanillin production from Aerva lanata (L.) Juss.ex Shultes. M. S. Surya, Mohammed Ashiq and **Jayachandran, K** (2012). Indian Journal of Life Sciences 2 (1);9-15.2012..
17. Pilgrimage and depleting water quality; A preliminary study on river Pampa. Sajudeen P.A., Mohammed Ashiq and **Jayachandran. K** (2012). Ecology Environment and Conservation, 18 (4) 869-872.
18. Larvicidal Activity of *Strychnos nuxvomica* against *Anopheles stephensi*.. P.A. Sajudeen**,** Jiji Thomas, Koshy.P.M, Mohammed Ashiq, Jayachandran **K** (2012). Ecology Environment and Conservation, 18 (4). 83-86.
19. Inhibition of Violacein Synthesis In *Chromobacterium Violaceum* Dsts-1 Mutant. by Merlin Antony, Mohammed Ashiq, Sania Salim, Sajudeen P.A, Indu C. Nair And **K**. **Jayachandran*** (2013). International Journal of Advanced Biotechnology And Research, 4, 1, 1014-102.
20. Biodegradation of toluene hydrocarbon by a *Pseudomonas* sp isolated from gasoline contaminated soil. Pratheesh P.T. and **Jayachandran.K** (2012). International Journal of Plant, Animal and Environmental Sciences, 2(3), 210-216.
21. Analysis of the pathway of phenol biodegradation by *Alcaligenes sp* d_2. Merlin Antony, Indu C. Nair and **Jayachandran.K**. Collected Research Works entitled "Prospects in Biosciwence: addressing the issues "published by Springer. (2013).DOI 10.1007/978-81-322-0810-5-25. 209-220
22. Production and Characterization of Rhamnolipid Biosurfactant from Waste Frying Coconut Oil using a novel *Pseudomonas aeruginosa* D Journal of Applied Microbiology, Seba George and **Jayachandran K** (2012).. Impact factor 2.5. DOI 10. 1111/jam-12069.
23. *In silico* characterization of a novel β-1, 3-glucanase gene from a *Bacillus amyloliquefaciens*, a bacterial endophyte of *Hevea brasiliensis* antagonistic to *Phytophthora meadii* .Amith Abraham[a], Sunilkumar P. N.[b], Shaji Philip[c], Divya G. Nair[d], Aparna C.[a] and **Jayachandran K**[a*] (2012).Journal of Molecular Modeling (Springer). Impact factor 2. DOI10.1007/s00894-012-1645-3 **Impact Factor-2.2**
24. Novel bacterial endophytes from *Hevea brasiliensis* acting as biocontrol agents against *Phytophthora meadii*.Amith Abraham[a],Shaji Philip[a], Kuruvilla Jacob.C[a] and **Jayachandran K**[b*] (2013). BioControl DOI, 1007? S10526-013-9516-0 (Springer).
25. Selective Amplification of Catechol 2, 3 dioxygenase gene from phenol degrading *Alcaligenes sp* d_2 isolated from soil. Ashiq,M, Indu C Nair, Sajudeen P.A and **Jayachandran.K** (2013).International Journal of Pharma and Biosciences.4(3),(B)105-110 Impact factor- 0.5
26. Molecular modeling and docking studiesw of an alpha 1,4- amylase from endophytic Bacillus amyloliquefaciebns.Frontiers in Life Sciences, Amith Abraham[a], Sunilkumar P. N.[b], Shaji Philip[c], Divya G. Nair[d], Aparna C.[a] and **Jayachandran K**[a*] (2014). Frontiers in Life Sciences, 2014,DOI.10.1080/21553769.2013.852993.(**Taylor and Francis). Impact Factor 1.5.**

27. Phenazine 1 carboxylic acid mediated anti-oomycete activity of the endophytic *Alcaligenes* sp EIL-2 against *Phytophthora meadii.* Amith Abraham[a], Shaji Philip[c] Manoj Kurian Jacob, Sunilkumar P. N.[b],C.Kuruvilla Jacob and **Jayachandran K**[a]. Microbial Research, http;//dx.doi.org/10.1016/j.micres.2014.06.002 (2014) (Elsevier)

28. Microbial consortia formulation for the effective biodegradation of benzene, toluene, xylene and phenol. Dhanya Vijayan[a], Amith Abraham[a], Indu Chandrasekharan Nair[b] and **Jayachandran Kochupurackal**[a*.] International journal of Microbiology, Biotechnology and Food sciences Vol 3, No 6. (2014),
29. Hazeena VN, Sruthi CR, Soumiya CK, Haritha VH, Jayachandran K, Anie Y . Vernonia anthelmintica (L.) Willd. Prevents Sorbitol Accumulation through Aldose Reductase Inhibition. Scholars Academic Journal of Biosciences: 4(10A); 787-795
30. Surya PR, Liji L, Jayachandran K, **Anie Y.** Bacteria from South Indian Fermented Foods and Food- Waste Dump Sites as Sources of Fibrinolytic Enzymes. Imperial Journal of interdisciplinary research 2016: 2(7); 528- 536.
31. ..Regulation of acyl homoserine lactones synthesis in Pseudomonas putida JMQS1 under phenol stress" .Merlin Antony and Jayachandran.K. Accepted for publication in Journal of Water, Soil and Air pollution, Springer. (DOI: 10.1007/s11270-016-3018-5). Impact factor 1.5

6. Book Chapter Contribution

1. A chapter entitled '***Polyphenol oxidase and its applications***" in the book "Chemistry and Biotechnology of Phenols" published by **Ane Books, New Delhi. 2010.**
2. A chapter entitled 'Fermentation of Food processing byproducts' in the book "Valourization of food processing byproductsproducts published by **CRC, Taylor and Francis, 2012.**

7. Some of the realistic approaches…….

BIOREACTORS designed for various applications…..

1. **For phenolic effluent treatment**

First Reactor

Second Reactor

Plate 3

Third Reactor

Plate 10

Treatment of the Effluent with Chitosan Coating

Plate 11

Treatment of the Effluent with the Three Stage Reactor

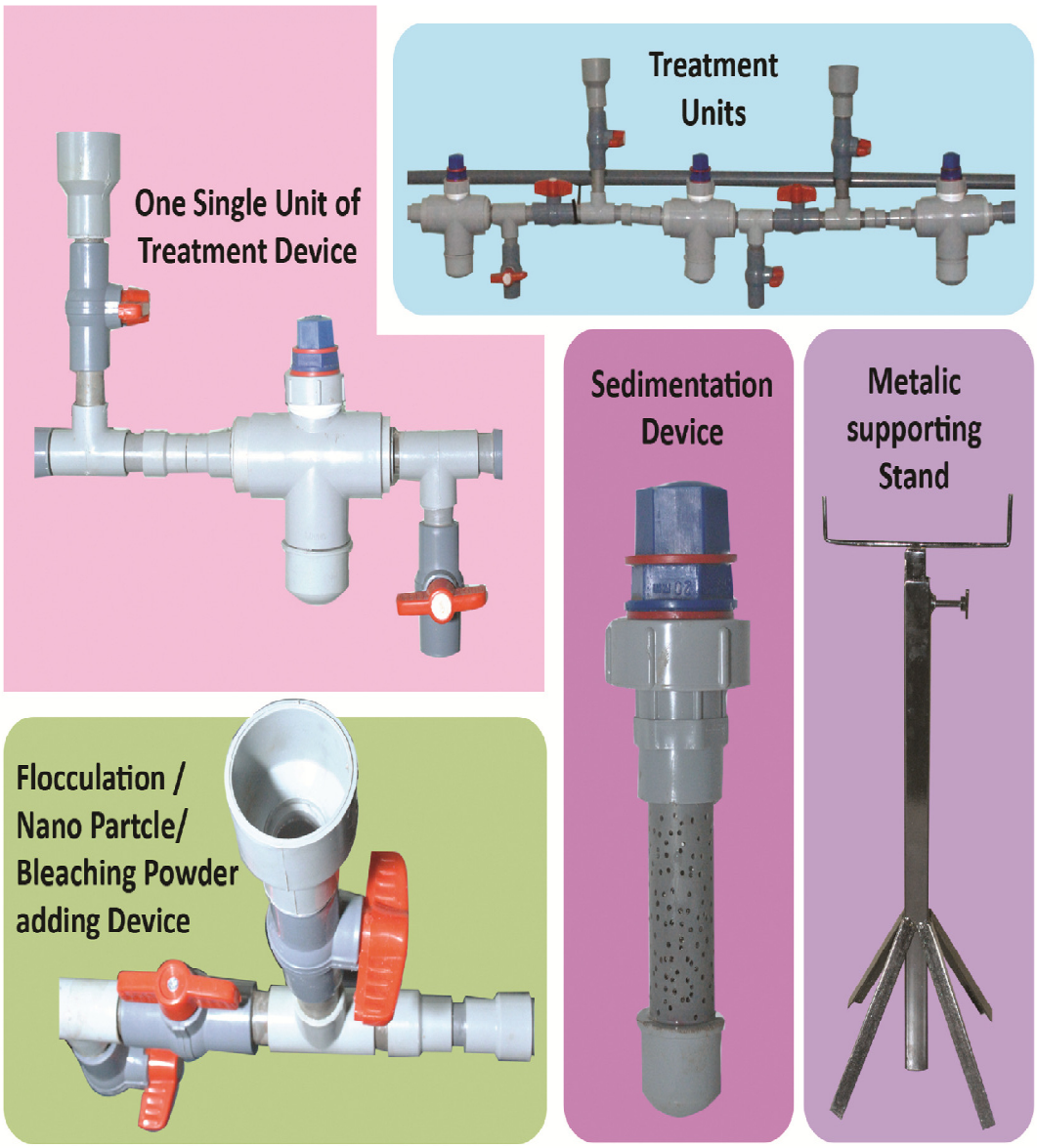
te treatment of the effluent
C, immobilized cells and
n

2.For plant metabolite production……

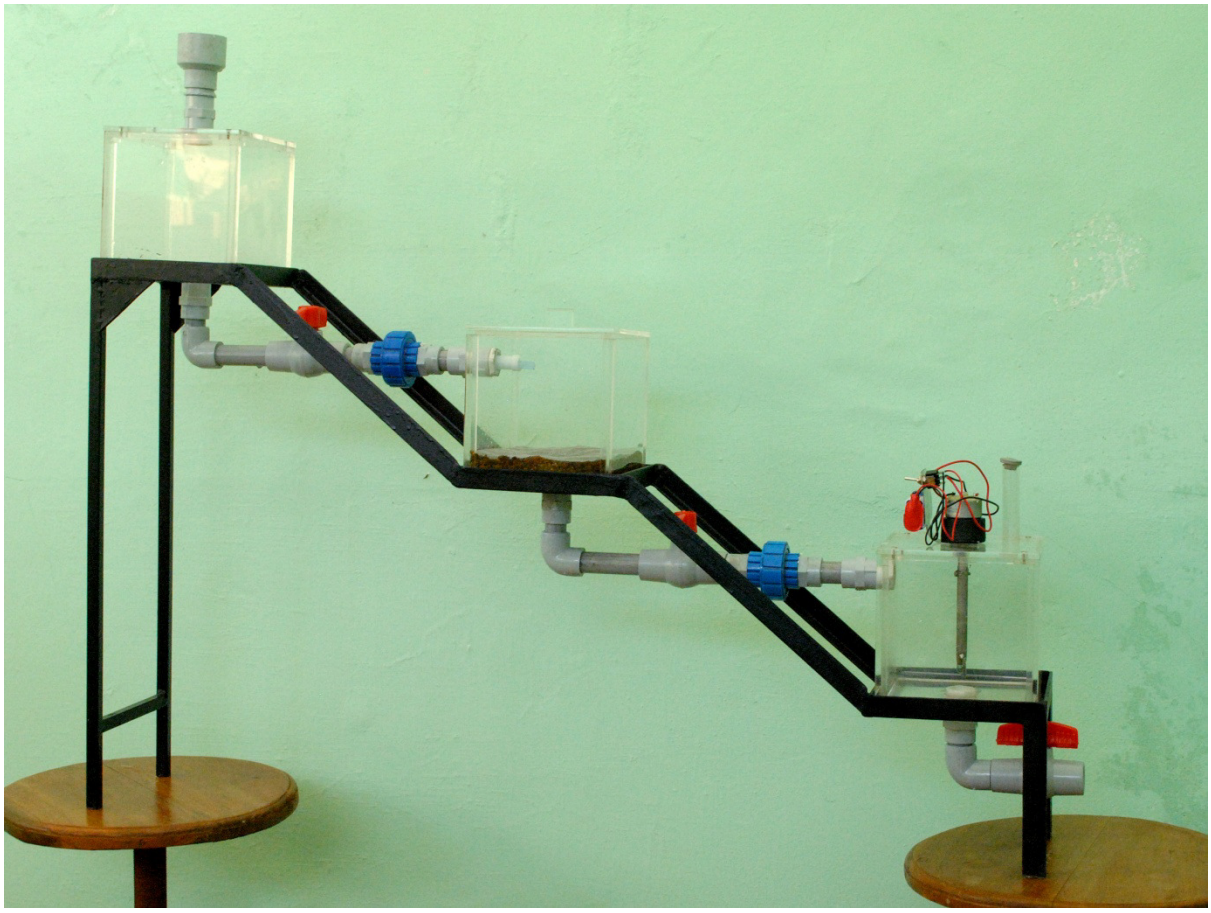
Three bed bioreactor with cells of *Scoparia dulcis* immobilized on *Luffa* sponge for the production of Scopadulcic acid B.

3.A probable solution to Drinking water treatment…….

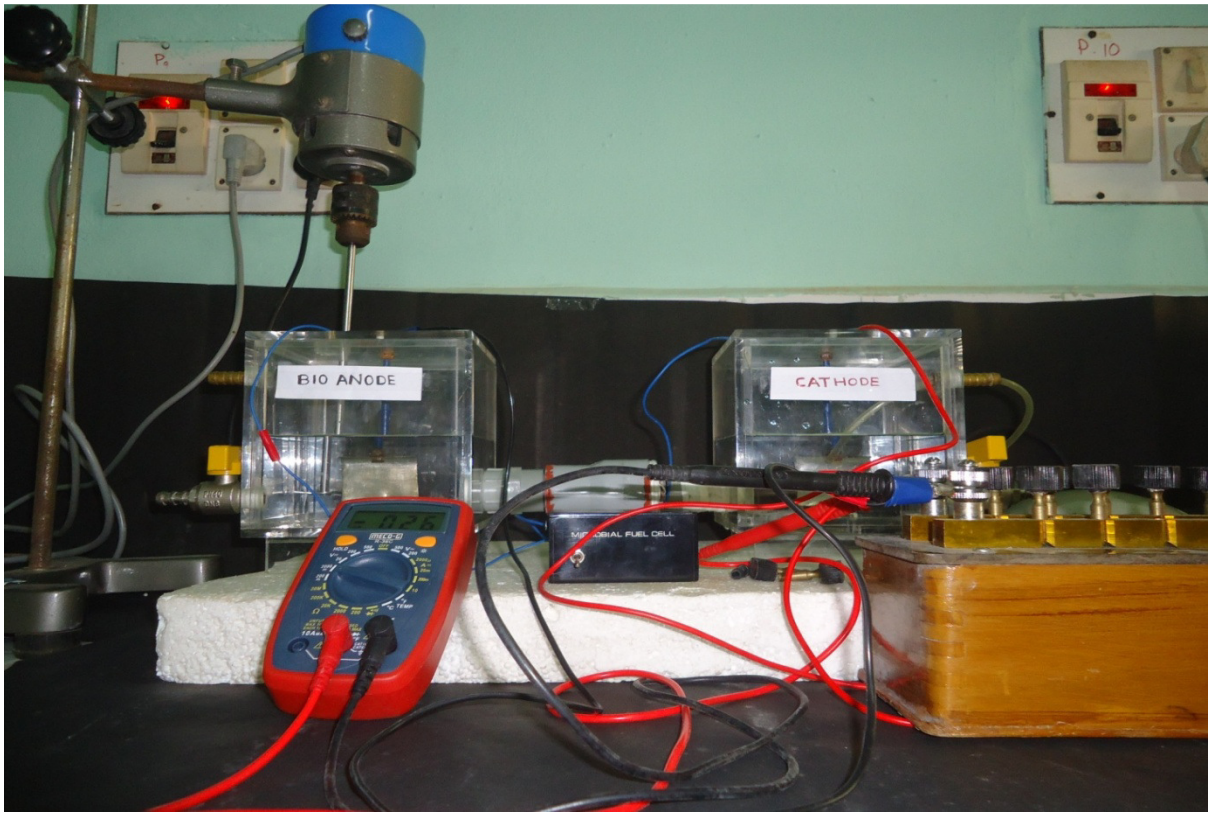
PARTS OF THE PROPOSED BIOREACTOR FOR EFFECTIVE TREATMENT OF CONTAMINATED DRINKING WATER



4.For Aniline effluent treatment

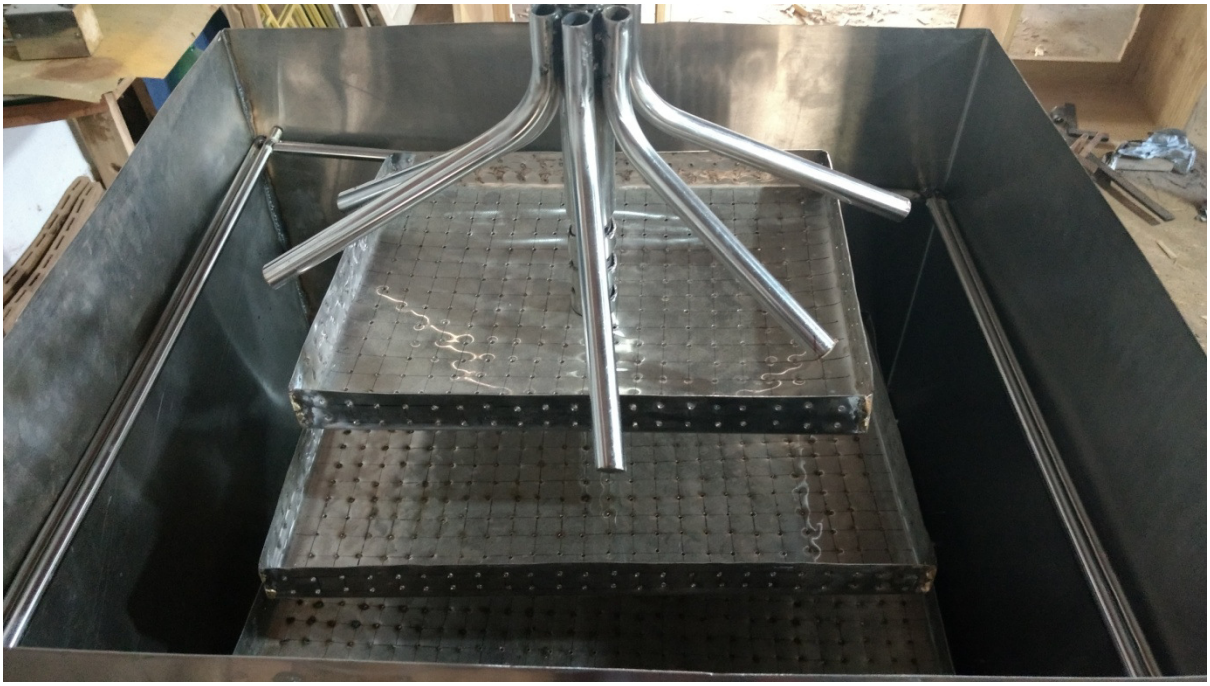


5.Microbial fuel cell designed for Phenol biodegradation



6.Designed a bioreactor for the project entitled Production enhancement and market promotion of Black Pepper and Ginger crops among the tribal population in Wyanadu district of Kerala.Project of 79.36 lakhs sanctioned by DBT to Kannur University and M.S Swaminadhan Foundation.Paptent submission in progress


BioConFerm
Designed & Developed by
Department of Biotechnology & Microbiology
KANNUR UNIVERSITY



From lab to field…….

Effective implementation of BIRD (Govt of Kerala) programme at Athirampuzha Gramapanchayath

VERMICOMPOSTING




8. INDUSTRY LINKAGE/ ACADEMIC TIE-UPS

1. Academic linkage with Rubber research institute of India
2. Academic linkage with Department of Microbioloy and Biotechnology, Kannur University
3. Academic linkage with NIIST, CSIR Trivandrum

9. **OTHER ACHIEVEMENTS**

1. **Adjunct Faculty** - Inter University Instrumentation Centre, Mahatma Gandhi University, Kottayam
2. Faculty adviser – Bioscience Forum, School of Biosciences
3. H. Director- Inter University centre for studies in science of music. M.G University
4. Member . Board of studies for Biosciences, M.G. University

10. **MEMBERSHIP IN ACADEMIC BODIES**

1. **SECAS**
2. Kerala Science Academy

11. EDITORIAL EXPERIENCE

1. Reviewer in Process Biochemistry, Elsievier
2. Reviewer in African Journal of Biotechnology
3. Reviewer in Research Journal of Biotechnology**.**