

8th International Conference on

Nutrition, Food Science and Technology

December 09-10, 2019 | Dubai, UAE

Microbial technology for sustainable nutritious Food production with environmental protection

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Fresh water scarcity is knocking at the door. General health as well as food security is also threatened due to this crisis. Agriculture uses about 89% of the fresh water that is drawn everyday accounting to be one of the major causes of freshwater scarcity. Dairy industry utilizes and produces a lot of water. For each liter of milk processed, about 3 liters of wastewater is generated. The wastewater is nutritionally rich and causes environmental damage unless treated extensively before discharge. The Microbial Technology Group in India has developed a process through microbial intervention which converts dairy wastewater into a biofertilizer that enhances yield of economic crops. It maintains the nutritional quality of the food while increasing its yield. This biofertilizer unlike its counterparts available in the market can enhance yield of non-tuber crops when compared to the produce using chemical fertilizer. Through this approach fresh water as well as chemical fertilizer use for agriculture can be reduced substantially while decreasing the cost of the product due to higher production. The adoption of this technology would be economically beneficial for both the dairy farms and the farmers. The process has been scaled up to 11m³/day processing capacity with enhance grain yield in case of Mung bean (*Vigna radiata* var. MEHA) (1.56 folds), Maize (*Zea mays* var. Vijay) (1.19 folds), Black Gram (*Vigna mungo* var. Pant-U-31) (1.04 folds). Biomass yield enhancement is seen in case of Sorghum Sudan grass (*Sorghum sudanense*) (3.5-fold), Ramie fiber (*Boehmeria nivea*) (1.3 fold), Lemon grass (*Cymbopogon citratus* var. Dhanitri and var. Krishna) (2.6 to 4.6 folds). In case

of Aloe vera (1.31-fold) the gel content as well as the leaf dimension are seen to increase as compared to the conventional practice. There was significant increase in percentage filling of grains in case of scented rice (*Oryza sativa* var. Kola Joha and var. Manikimadhuri) with maintained fragrance and production of hydroxy cyclooctene derivatives in the rice hull imparting protection from insect infestation.

Speaker Biography

Shaon Ray Chaudhuri did her PhD from Calcutta University in 2001 in Molecular Biology. She was a DST Fast Track Scientist in 2003 and has been working independently in the area of Microbial Technology since then. She is currently an Associate Professor at Department of Microbiology, Tripura University. Her group has been working on development of wastewater specific tailor-made microbial consortia for treatment with minimum dead mass generation. Under her guidance ten scholars have graduated with PhD degree; three scholars are pursuing their PhD while four others are working in the group to develop new solutions for waste management with environmental sustenance. She has to her credit 5 technologies transferred, 4 awarded international patents and 10 filed patents. Two of the developed technologies have being tested in three industries in India. She was the founder Director of RCM BioSolutions Pvt Ltd and has formed up a start-up named Waste to Wealth Innovative Technologies LLP. She has more than 50 papers published in refereed international journals. She has secured R&D grants of over USD 1.1M till date. She is a recipient of the Visitor's (President's) award under Technology category of 2019 while another technology earned the 16th position in DST Lockheed Martin Indian Innovation Growth Program in 2014.

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