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Human urine as organic alternative to chemical fertilizers: Positive feedback to poverty alleviation and safety of mother earth

Human urine is not a waste but a resource out of place. Average person voids around 2 liters of urine per day which is rich in nitrogen (15-19%), phosphorous, (2.5-5%) potassium (3.0-4.5%), carbon (11-17%) calcium (4.5-6%) apart from some growth promoting agents such as amino acids, glucose and vitamins and immense medicinal properties that enabled it perfect for urine therapy. More than 2.4 billion people in the world of which nearly 60% of the Indian population do not have access to proper sanitation causing high risk numerous of airborne and waterborne diseases when discharged into the sewer system or through open defecation. On the other hand, there is vast scope for its profitable uses in various economic driven activities. As a result, eco-san has emerged as eco-friendly alternative to close the loop between sanitation and agriculture by the way of providing organic fertilizers in agriculture and aquaculture production. Urine diversion toilet is particularly useful for collection and to create safe fertilizers that would substitute cost intensive synthetic chemical fertilizers and provide food security, poverty and malnutrition alleviation and improve the trade balance of countries importing chemical fertilizers. Researchers have shown human urine as a safe fertilizer in organic farming to produce tomato, barley, wheat, spinach, ash gold, french bean, pole bean, pumpkin, banana, green amaranth, cucumber, etc. Zooplankton, *Moina micrura*, an important fish food grew and reproduced well in 0.5% solution of fresh human urine. Though fresh and stored urine were effective to produce microalgae, zooplankton and fish, the 6-months old stored urine was superior for the production of phytoplankton as well as different species of Indian carp and freshwater prawn than the latter ones. At the same time, there was no difference in the counts of *Escherichia coli* between the urine treated tanks and the control. Further, the production cost is very cheap and highly cost effective. It is exigent to promote ecological sanitation for ensuring nature, society, process and device of the wastes into wealth. However, further research is needed to explore strategies from the risks of pharmaceutical drugs, antibiotics, hormones and some other pathogenic to ensure safe uses of human urine in various activities.

Biography

B B Jana is a Fellow of National Academy of Agricultural Sciences, New Delhi as well as some other prestigious academies of India and a Recipient of Joy Govinda Memorial Award of the Asiatic Society. He has published several monographs, books and contributed chapters in UNESCO-Encyclopedia and has published more than 235 peer reviewed papers. His research includes wastewater aquaculture, ecological sanitation, eco-restoration, ecological engineering, microbial nutrient cycling, integrated organic farming, impact of global warming and climate change issues in aquaculture, water conservation, etc.

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