

Review of: "Assessment of Quality, Bacterial Population and Diversity of Irrigation Water in Selected Areas of Minna, Niger State, Nigeria"

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Potential competing interests: No potential competing interests to declare.

Abstract:

PAPER: Results obtained showed that bacterial population and diversity were significantly affected by location and that all the physical and chemical properties of the irrigation water were significantly affected by location except for chemical oxygen demand (mg/l).

COMMENT: Put in one sentence that states all factors were influenced by location.

Introduction:

PAPER: Most of the sources of water used for irrigation in Nigeria are water that contains contaminants of fecal origin from the sewage system and also contains heavy metals and other pollutants from urbanization, like human activities and washing away of soil from farmlands where fertilizers, pesticides, and other chemicals have been used.

In Minna, Nigeria, wastewater flows from different sources into the main drainage channels containing refuse, domestic and industrial waste, which may contaminate water used for irrigation or be a source of energy for heterotrophic nutrition and microbial growth and development.

COMMENT: This section needs referencing.

PAPER: The water used for irrigation contains microorganisms, which are living organisms that may be single-celled (Madigan and Martinko, 2006) or multicellular. Microorganisms are diverse, and they include bacteria, archaea, and most of the protozoa; the water also contains some species of fungi, algae, and some species of animals like rotifers.

COMMENT: This section can be removed.

GENERAL COMMENT: This introduction is too general; it's about water needs for the world as well as what bacteria are. The introduction should be more relevant to the paper and the aims of the paper. Focus more on water contamination and the problems associated with it health-wise, and then what bioremediation is and which bacteria can bioremediate which metals, citing proper literature for it.

Materials and Methods

PAPER: Study Area

COMMENT: Give the location name with the coordinates in brackets.

PAPER: The average annual temperature is 27⁰C (80.7⁰F) with an average monthly temperature of 5.3⁰C

COMMENT: A monthly average of 5.3°C does not sound right???

PAPER: Treatments are sewage water from locations practicing irrigation as follows: Soje-A in Kpakungu, Fadikpe, Mechanic village in Keterengwari, and Bari in Chanchaga, replicated three times and arranged in a Completely Randomized Design

COMMENT: Please expand a bit here. What is the treatment here? Or are you just talking about water sprayed? What constitutes a replicate? Did you take samples on different days or just 3 samples? Your design is difficult to comprehend.

PAPER: The physical, chemical, and microbial analyses were in accordance with the "Standard Methods for the Examination of Water and Wastewater,"

COMMENT: Need a citation for this.

PAPER: 1 ml of the 10⁶ dilution

COMMENT: Don't start a sentence with a number.

PAPER: Culturing

COMMENT: Need citation for the culturing procedure.

PAPER: Lactose Test, H2S Test, O2 Test

COMMENT: Need citations.

Results and Discussion

PAPER: The *Bacillus* spp. were quite more able to assimilate N and C sources than *E. coli* and *Salmonella* (Table 2)

COMMENT: "Quite more able," please rewrite to make a better sentence.

GENERAL COMMENT ON ID: We live in an era where sequencing is standard, moving beyond 2nd generation and into 3rd generation sequencers. Why would you not sequence isolates? I think the authors have to justify the use of morphological and plate identification. Also, the identification has to be described better, with proper literature cited on how the IDs were made. As is, we are just taking their word for it.

GENERAL COMMENT ON STATS TABLES: These tables should include SD values.

GENERAL COMMENTS ON DISCUSSION AND PAPER: The methods followed for this investigation have a few

problems. Only culturable organisms can be obtained using the methods described here. Also, only aerobic. A lot of bioremediation processes depend on anaerobic conditions. It would have been better if a targeted metagenomic approach was followed to determine the full diversity in the different locations. The paper also does not provide any new findings, as the most "significant" organisms "found" is *Bacillus*, and its use in bioremediation is well and better documented.

RECOMMENDATION: I do not feel that this paper, as is, contributes enough to the scientific community to be published. Significant changes would have to be made to recommend publication.