

# Review of: "Plant growth promoting characteristics of halophilic and halotolerant bacteria isolated from coastal regions of Saurashtra Gujarat"

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In this study, the authors performed an initial screening on salt-resistant bacteria. But the authors had to do more evaluations on them. In my opinion, the information provided in this paper is not much informative. There does not seem to be a novel angle or take that might help drive future research in a certain direction. I did not find enough innovation in it to be published in this journal. It is well known that one percent of bacteria isolated from agricultural or non-agricultural farms are positive for plant growth-promoting characteristics. It was interesting for me to read this article because I realized that it is possible to publish articles without innovation in this journal (Scientific Reports).

I just mentioned some of the general ambiguities and suggestion for doing research in the future

## **Methods:**

### **Isolation of halophilic bacteria from soil samples:**

- A total of 15 soil samples (approximately 100 g each) were collected from agricultural fields from a depth of 5 cm around the crop rhizospheres with the help of an agricultural soil sampler. Why were not samples collected from rhizosphere soil?
- Halophilic agar plates were incubated at 35 °C for 5 days. Why at 35 °C? It is not clear for me author's reason for selecting this temperature. Such a temperature is usually used for isolating bacteria pathogenic to human

### **Determination of salt, pH and temperature tolerance test**

- **All isolates were tested separately in halophilic broth tubes supplemented with NaCl concentrations ranging from 5, 10, 15, 20 and 25 per cent for salt tolerance.**

**Control (tubes without NaCl and inoculated with isolates) is missing. It was better for the authors to report facultative halotolerant bacteria as well**

Authors mentioned that "A tube without inoculation served as the negative control for each range of salt, pH and temperature respectively." But at the end of this paragraph mentioned that "The strain that could grow at particular range of salt, pH and temperature were considered as tolerant by observing the presence or absence of growth and comparing it with negative control respectively for each isolate. It is not clear what authors mean with negative control here. If negative control is without inoculation, how author did this comparison?

### **IAA production**

- A colorimetric determination is not correct for indole acetic acid. It shows only production of auxins. Verification and

quantification specifically of IAA should have been done by HPLC

-Concentration of L-Tryptophan is missing in this assay, which was very important to mention

- Why at 30 C°? It is not correct to use two different temperatures for assaying the same bacteria (30 and 35 C°).

- Phosphate solubilization test

Phosphate solubilization: The tricalcium phosphate test is not very reliable because all the bacteria/fungi that acidify the culture medium solubilize the phosphate. See the article of Bashan Y, Kamnev AA, de-Bashan LE (2013) Tricalcium phosphate is inappropriate as a universal selection factor for isolating and testing phosphate-solubilizing bacteria that enhance plant growth: a proposal for an alternative procedure. *Biol Fertil Soils*. doi: DOI 10.1007/s00374-012-0737-7. See this paper and assay the ability to solubilize fungi/bacteria by suggestions present in this paper

- Why at 28 C°? It is not correct to use two different temperatures for assaying the same bacteria (28, 30 and 35 C°).

Potash solubilization capacity

- Why at 30 C°? It is not correct to use two different temperatures for assaying the same bacteria (28, 30 and 35 C°).

Qualitative ACC deaminase production

- Why at 32 C°? It is not correct to use two different temperatures for assaying the same bacteria (28, 30 and 35 C°).

-The authors should have investigated the ability to produce plant growth-promoting properties of bacteria under salinity. It has been shown that production capacity of bacterial PGP traits can be reduced under salinity stress

- It was better to determine the maximum salt concentration at which these bacteria could grow

-The potential of superior isolates should be investigated on stimulating the growth of a salinity stressed plant

Table 1: It is interesting for me that author isolated such bacteria from soils that are not even saline.

Reporting content of soil P and K in P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O is correct scientifically. See this paper (Lambers, H., Barrow, N.J. P<sub>2</sub>O<sub>5</sub>, K<sub>2</sub>O, CaO, MgO, and basic cations: pervasive use of references to molecules that do not exist in soil. *Plant Soil* 452, 1–4 (2020).

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Fig. 1 & 2: statistical analysis is missing. It is interesting for readers to know if there is significant difference among bacteria in terms of IAA, etc