Microbes from the Negev Desert with Potential for Use as Plant-Growth Promoting Bacteria

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BACKGROUND

Exponential growth in the world population, coupled with increasing environmental damage, underlines the need for more sustainable and environmentally-friendly approaches to agricultural practice. Many current approaches utilize chemical additives to accelerate crop growth. Newer, more environmentally-friendly strategies include the use of transgenic plants and plant-growth promoting bacteria (PGPB). Unfortunately, most PGPBs identified thus far fix little or no nitrogen. This limits their utility in rhizosphere soil, which contains the bulk of the nutrients found in arid environments. There is therefore a pressing need to identify PGPBs that not only have plant growth-promoting activity, but also demonstrate the ability to fix nitrogen, in order to support agriculture in underutilized, arid, nutrient-poor environments like deserts.

INNOVATION

Researchers in UCLA's Department of Botany and Ben-Gurion University of the Negev have jointly identified a number of new PGPBs in the rhizosphere of the Negev Desert, which may be useful in agriculture, silviculture, horticulture, and environmental cleanup applications. Notably, these species have been observed to fix nitrogen, chelate iron, solubilize phosphate, and secrete cellulase. These characteristics make them excellent candidates to support growth in arid environments, which will only become more widespread as global warming trends continue.

APPLICATIONS

- Promote plant growth in arid environments as a seed coating for:
- Agriculture
- Horticulture
- Silviculture
- Environmental cleanup

ADVANTAGES

- The first PGPB isolated from desert rhizosphere – likely to support growth in arid environments
- Avoids the environmental consequences of using chemical growth agents

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,212,943	02/26/2019	2013-797

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OTHER INFORMATION

KEYWORDS

Agriculture, plant growth, bacteria, horticulture, rhizosphere

CATEGORIZED AS

- **Agriculture & Animal Science**
  - Nutraceuticals
- **Biotechnology**
  - Food
  - Industrial/ Energy

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