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Isolation of Bacterial and Fungal Microbes From the Rhizosphere of *Shepherdia utahensis* 'Torrey'

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Background

Shepherdia ×utahensis 'Torrey' is a buffaloberry hybrid between *S. agrestea* (Silverleaf buffaloberry) and *S. rotundifolia* (Roundleaf buffaloberry). All plants have a microbiome that plays a significant role in their growth and development. This hybrid variety is drought-tolerant and may harbor many plant growth-promoting microbes.

Objectives:

Our objective is to isolate plant growth-promoting microbes (bacteria and fungi) from the rhizosphere soil of this plant.

Methods

Root sample collection:

The roots of the hybrid buffaloberry were collected from the plants located at the USU campus in Logan, Greenville farm at USU Logan, Utah, and USU botanical garden in Kaysville, Utah, in a phosphate buffer.

Separation of Rhizosphere soil:

The rhizosphere soil (soil attached to roots) has been separated by shaking in the buffer. The roots were removed, and the soil was pelleted by centrifugation. The rhizosphere soil was stored at 40 °C until use.

Serial dilution:

The rhizosphere soil was diluted to a 10:95 ratio in sterilized water by W/V and then serially diluted.

Isolation of bacteria:

We spread 100 µl of the last three dilutions, each plated on five different agar media.

- ❖ Potato Dextrose Agar: Isolation of Fungi
- ❖ Actinomycetes Isolation Agar: Isolation of actinomycetes
- ❖ Yeast mannitol Agar: Isolation of Rhizobium
- ❖ Minimal Media: Isolation of slow-growing microbes
- ❖ 1/4 Nutrient Agar: As a general, all-purpose growth media

Purification of isolates:

The unique individual colonies were picked from each dilution and streak plate on 1/4 Nutrient Agar to obtain a single pure bacteria.

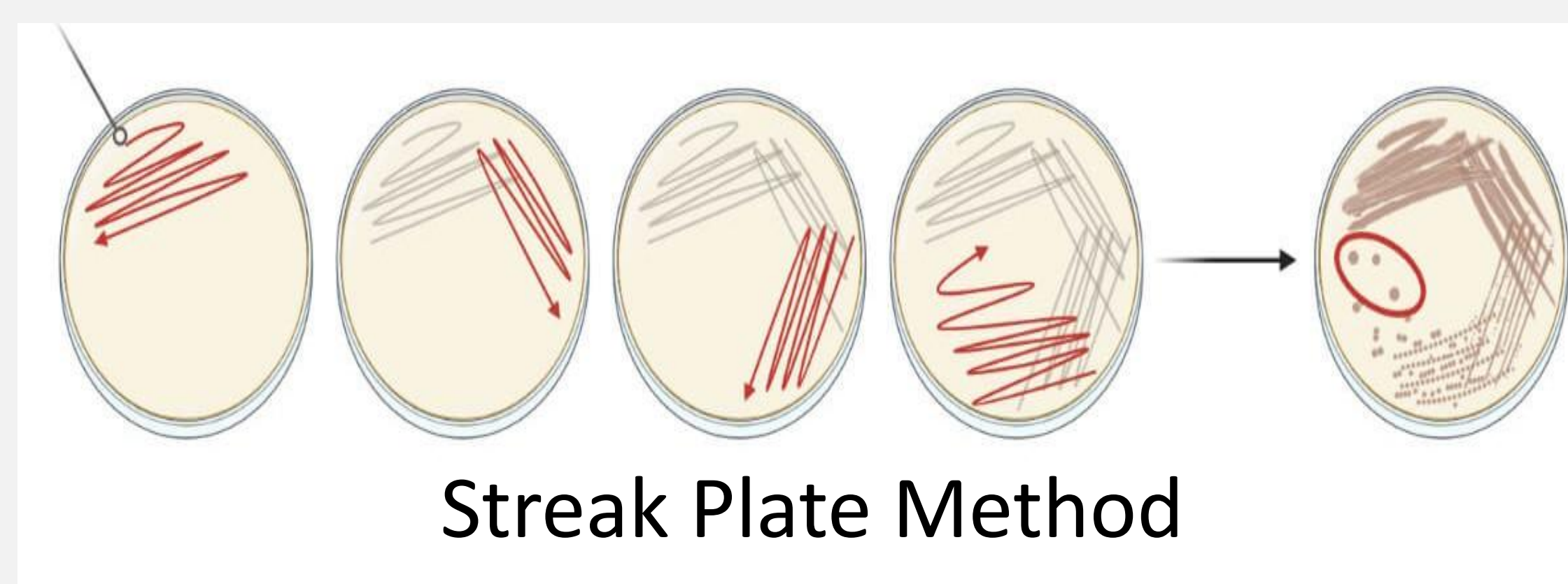
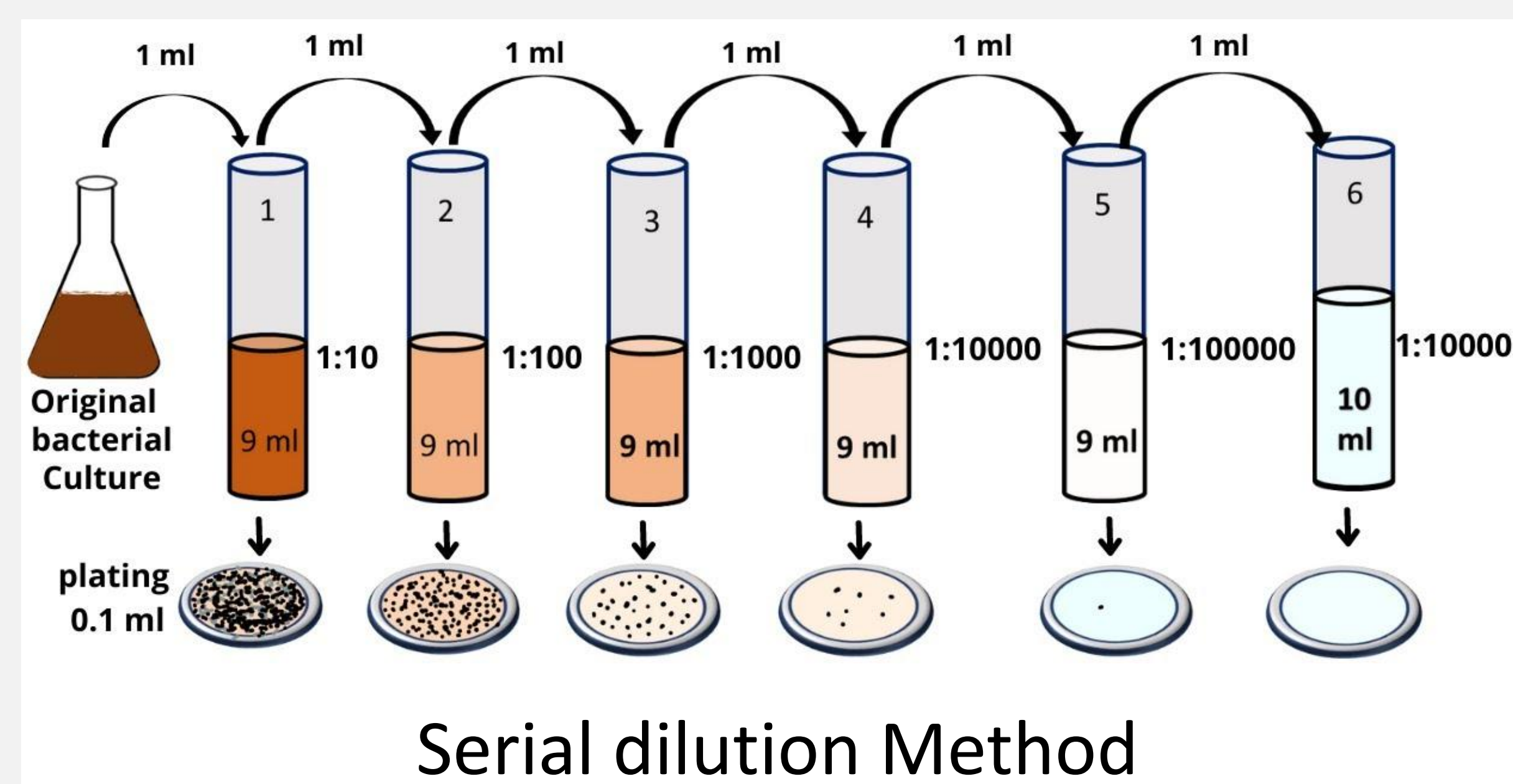
For the Future...

The purified isolates will be tested for plant growth prompting traits such as Nitrogen fixation, Phosphate solubilization, Siderophore production and Indole Acetic Acid production

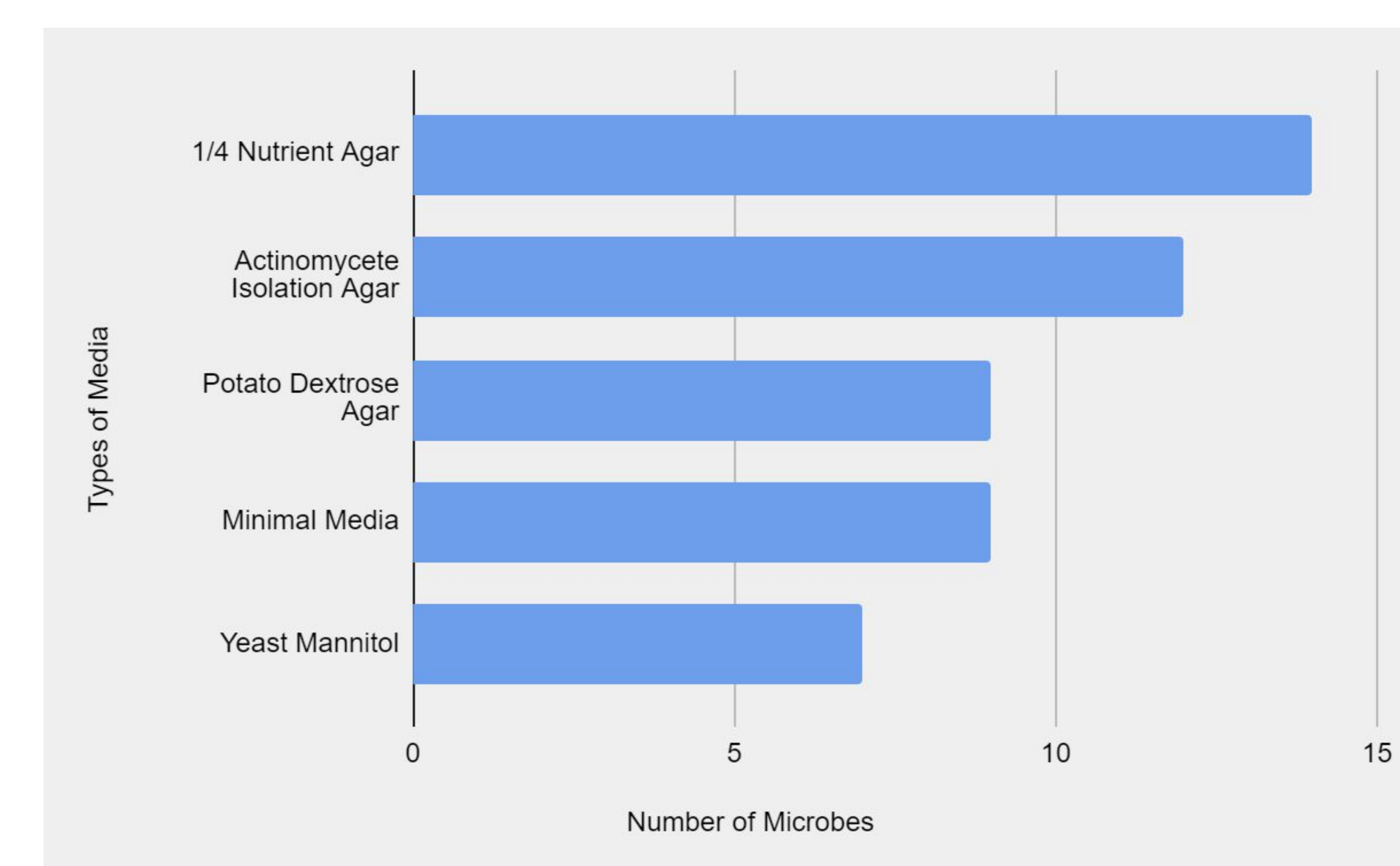
An enormous variety of microbes cohabiting in *Shepherdia × utahensis* 'Torrey'



Shepherdia × utahensis 'Torrey' at USU campus



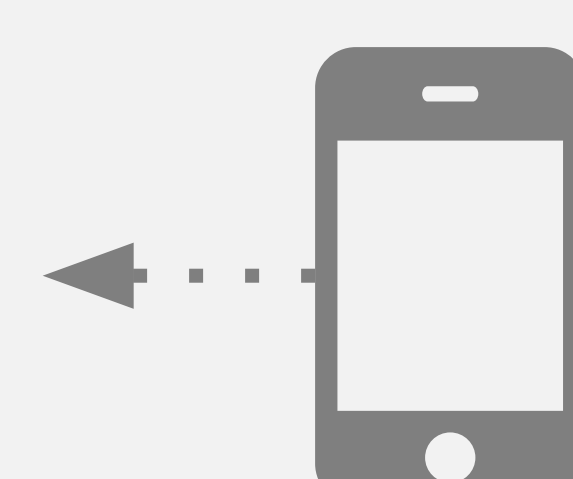
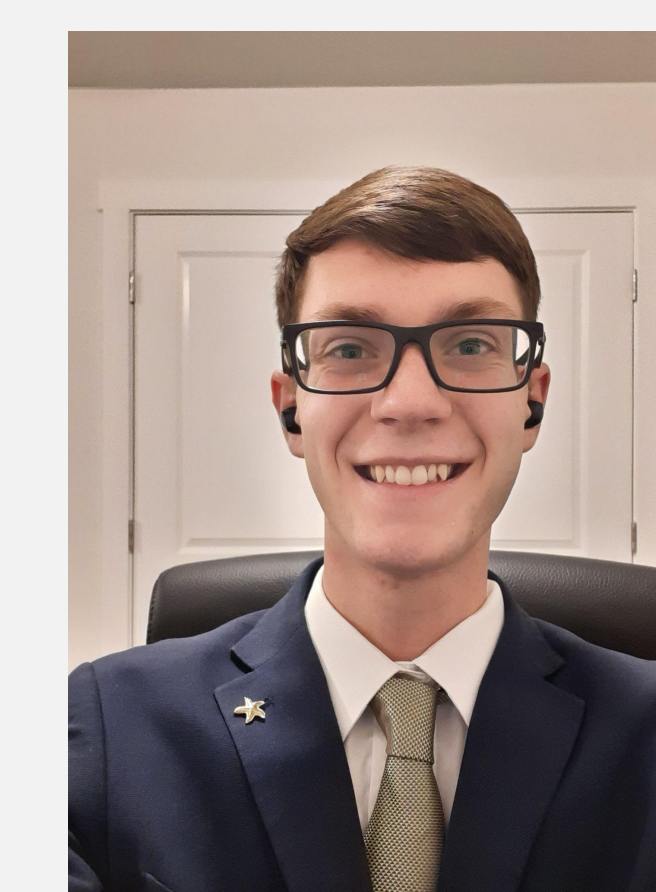
From top left to bottom right: Actinomycete Isolation Agar, Yeast Mannitol, Potato Dextrose Agar, Minimal Media, and 1/4 Nutrient Agar



Different microbes, and in different amounts, grew in different mediums



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Amita Kaundal | Utah State University



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