Soil texture influences on bio-surfactant sorption rates

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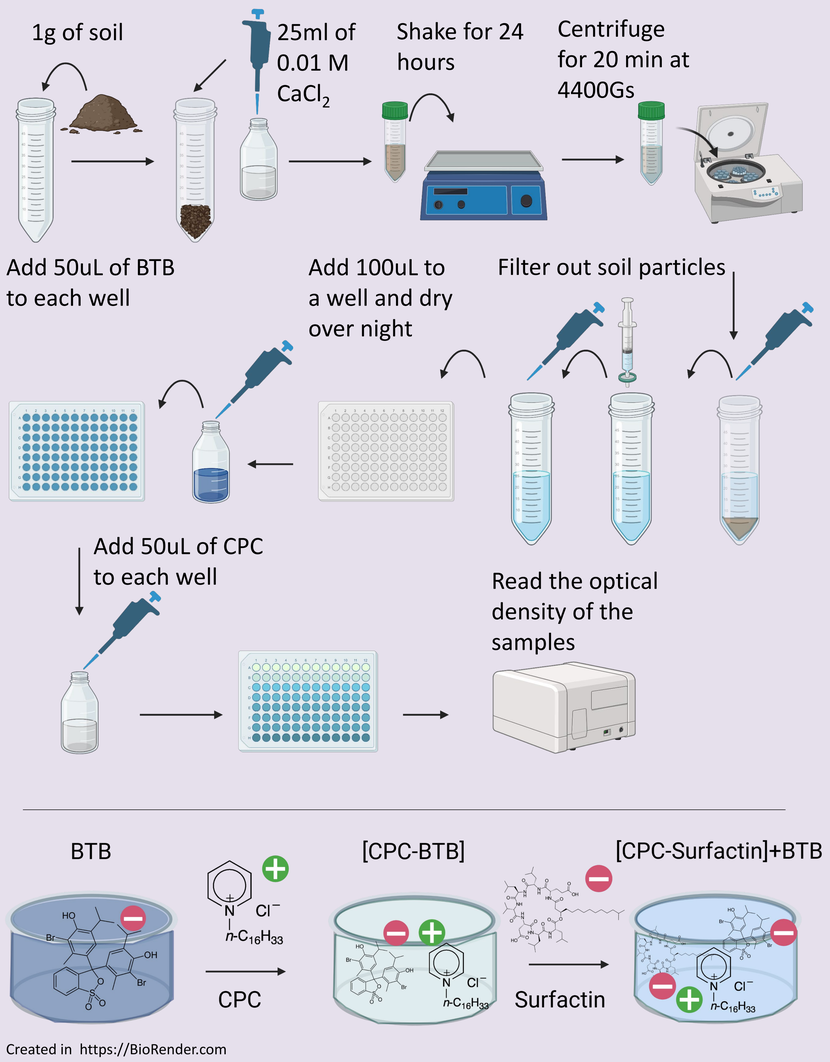
Background and Motivation

- Due to anthropogenic activity, rapid changes in the environment have led droughts to become a frequent threat.
- Surfactants have been found to increase soil water retention and soil wettability.
- It is important to understand what types of soils biosurfactant amendments are most effective in so producers can administer these types of amendments efficiently.

Objectives

To further develop analytical methods that can be used to rapidly quantify surfactin sorption in soils of different textures and surfactin produced by *Bacillus subtilis* in different chemical environments

Experimental Design



Results

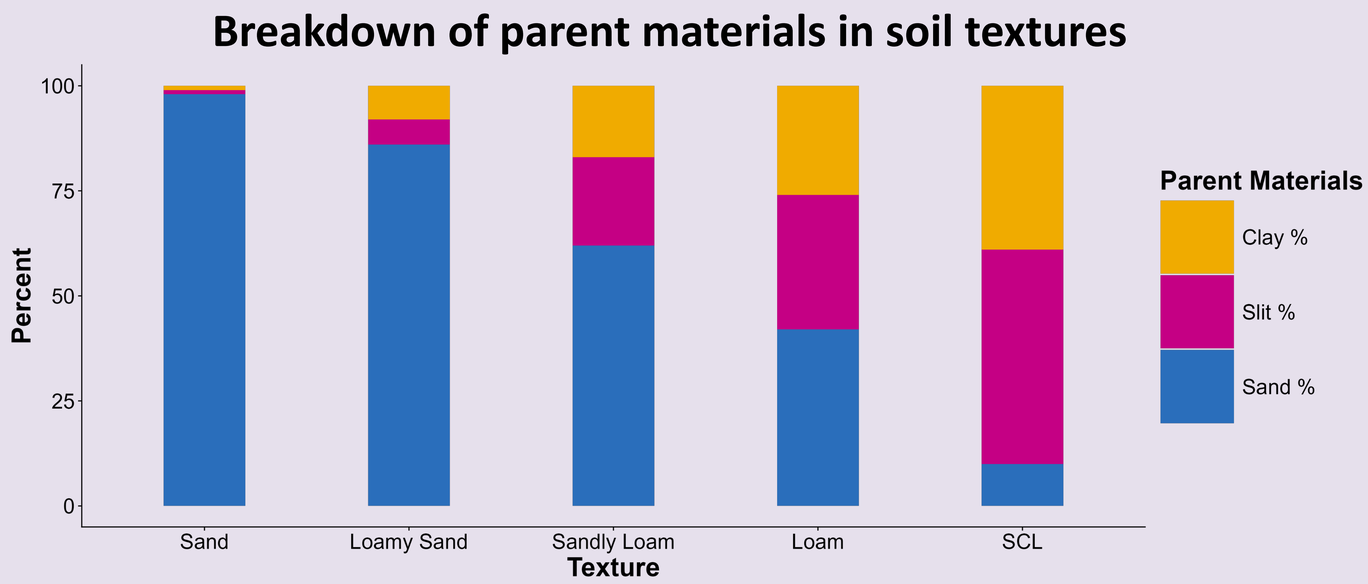


Figure 1: These are the five soil textures used throughout the experiment, which were created using soil from Kansas.

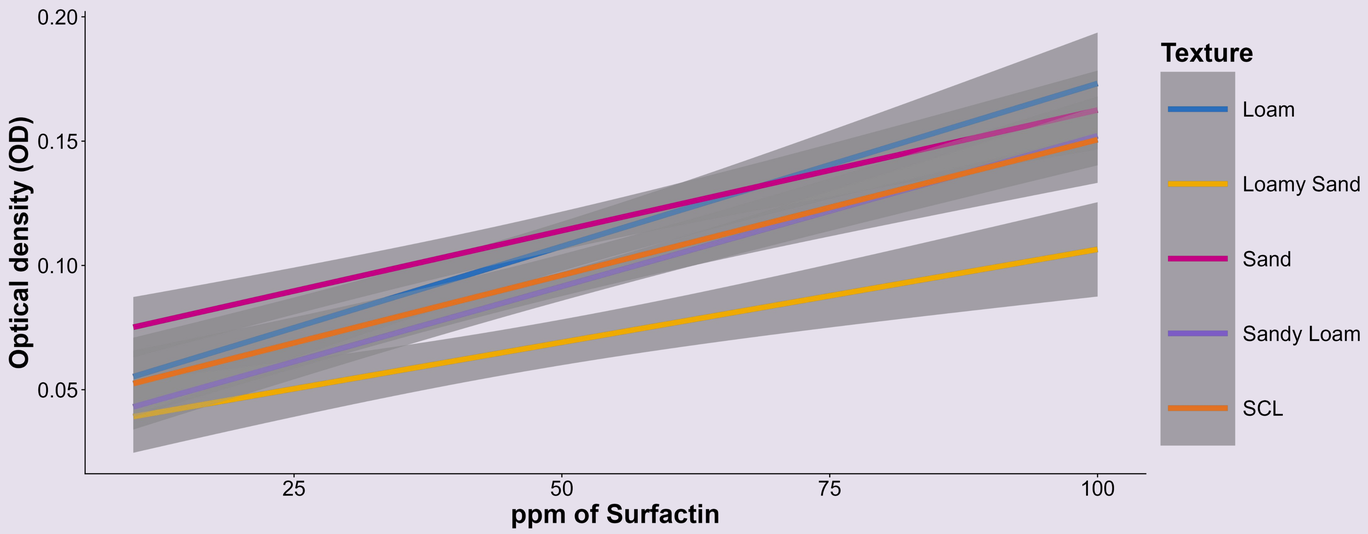


Figure 2: These are the calibration curves of the five soil textures. These curves can be utilized to convert optical density into an absolute value of surfactin content. The curves are significantly different.

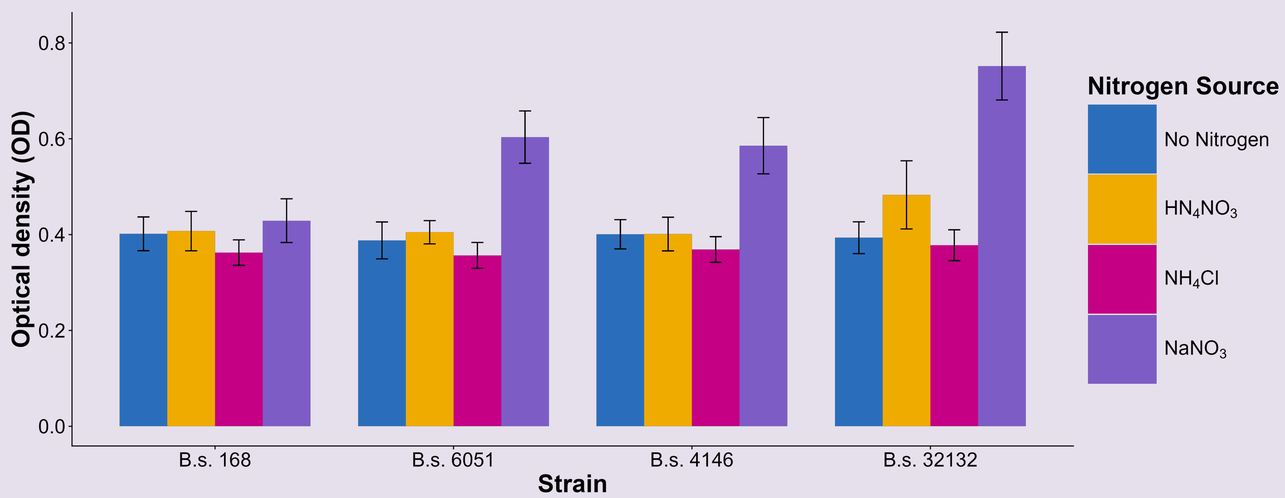


Figure 3: Four strains of *Bacillus subtills* were used. Strain 168 was used as a control producing zero surfactin. $NaNO_3$ was the source with the highest yield of surfactin, and Strain 32132 was the highest producer of surfactin.

Conclusion

- Strain 32132 of *Bacillus subtills* is the highest yield in terms of surfactin
- $NaNO_3$ favor the bacterial growth and therefore the production of Surfactin.

Acknowledgements

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