Deciphering putative biostimulant properties of a seaweed extract made from *Gracilaria gracilis* in tomato plants

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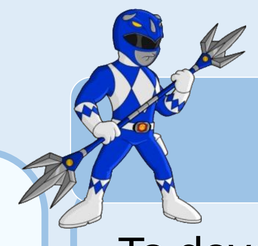
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To give you some context…

The agriculture sector is facing several challenges worldwide. Therefore, it is crucial to find **new strategies** to accomplish safe, healthy and sustainable food production for present and future generations. With this in mind, **plant biostimulants** have been widely explored as a potential alternative, since they can contribute not only to reduce the use of chemical fertilizers but also to increase crop production. They can be made from a variety of natural sources, including **seaweeds and plant-growth promoting bacteria** (PGPB). Regarding the application of seaweed extracts, it poses several concerns at different levels.



Our goal

To develop a **pipeline** to assess **biostimulant effects** of a seaweed extract, from ***Gracilaria gracilis***, on **tomato** (*Solanum lycopersicum*)

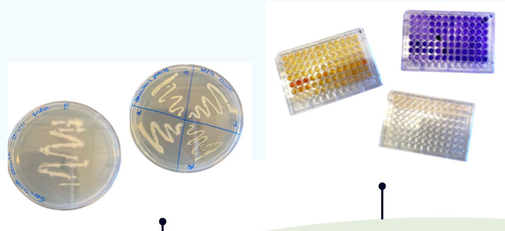
How we did it?



Gracilaria gracilis **extract (GE)**

Approaches

1 ***GE microbiota***



2 ***Full extract***





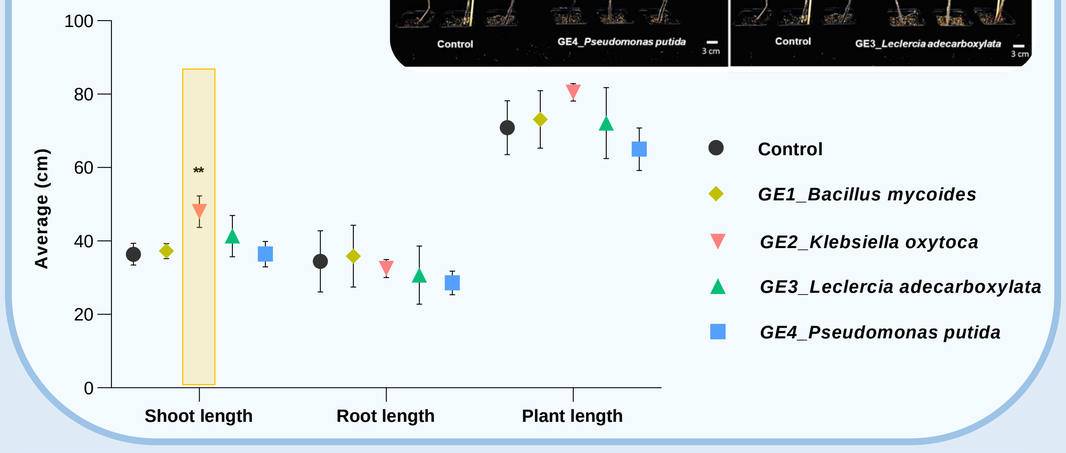
Changes in culturable microbiota profile (soil and roots)

Results

1 Characterization as bioinoculants

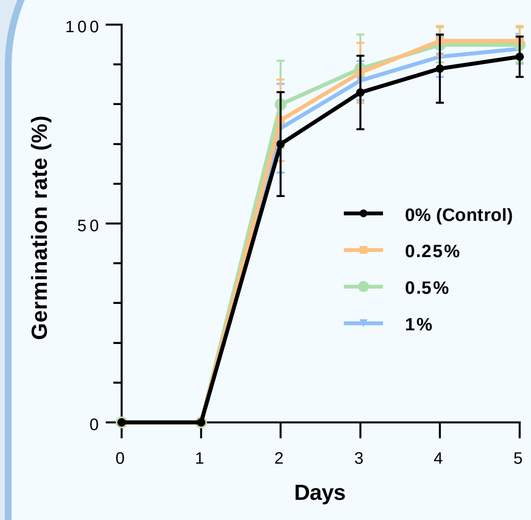




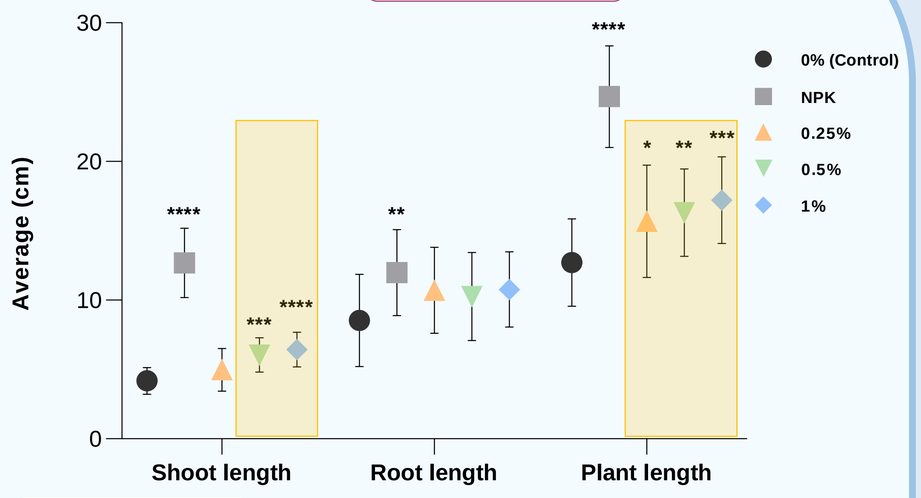


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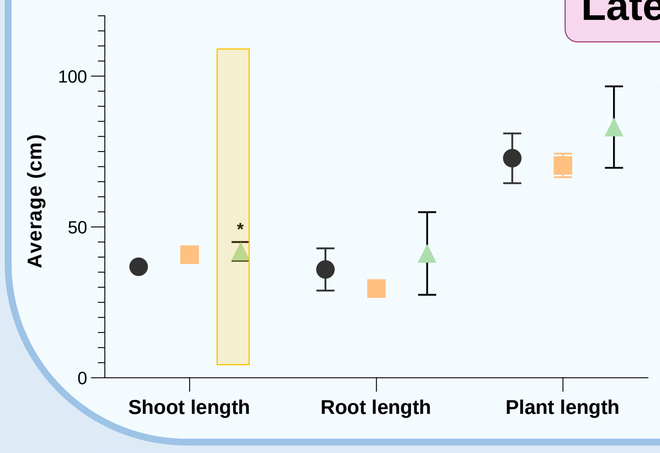
Germination

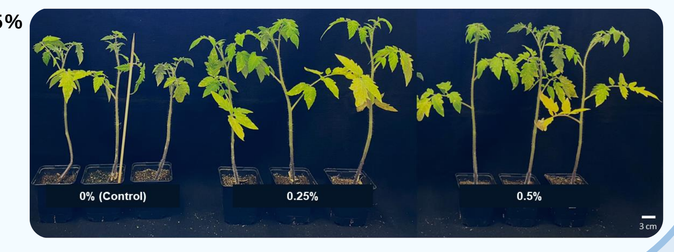


Early-stage



Late-stage





Conclusions

1 ***GE microbiota***

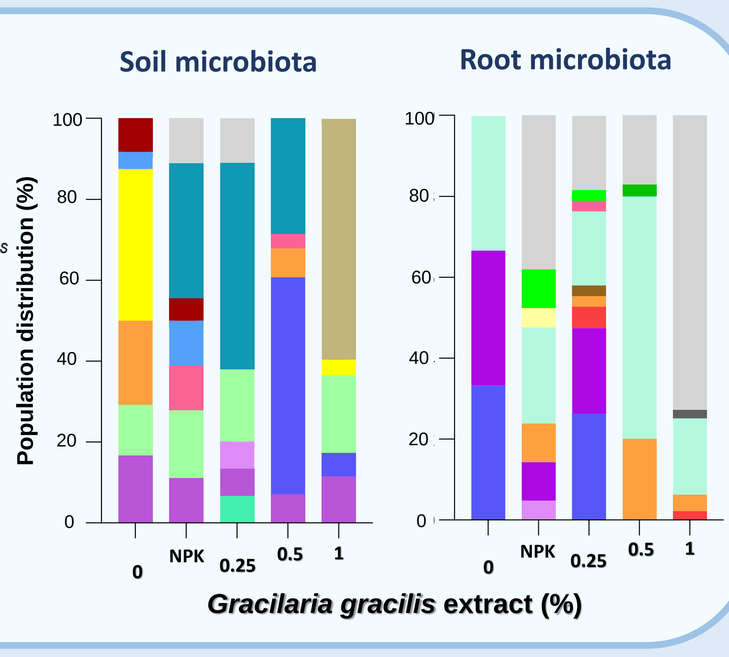
- 4 bacterial strains identified
- PGP traits (biofilm and auxins production, and growth in ACC)
- GE2_*Klebsiella oxytoca* boosted tomato´s shoot length

2 ***Full extract***

- Slightly increased germination rate
- 0.5% concentration showed to be beneficial for tomato growth
- Modulated culturable microbiota profile

Microbiota profile changes







References

https://doi.org/10.3389/fpls.2019.0065
https://doi.org/10.1515/bot-2019-0012