

Endophytes as antivirulence agents

Strategies employed by endophytes for maintaining host tissue colonization and aiding host plant defense
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Our work demonstrates an important survival strategy used by endophytes to circumvent invasion by a plethora of generalist and specific pathogens. This study exemplifies a significant biological role played by the endophytes in different ecological niches, by acting as antivirulence agents, not only aiding host plant defense but also for maintaining colonization and their own survival inside plants.

“Endophytes” are a diverse group of microorganism inhabiting the internal tissues of the plant and constantly co-evolving with the host plant and associated microorganisms. These multitudinous interactions enable the endophytes to counter the invasion by a plethora of generalist and specific pathogens. Therefore, in order to maintain colonization inside the host plant in different ecological niches, endophytes employ certain functional traits developed during the course of evolution. Our work emphasizes on one such trait, commonly known as “quorum quenching”.

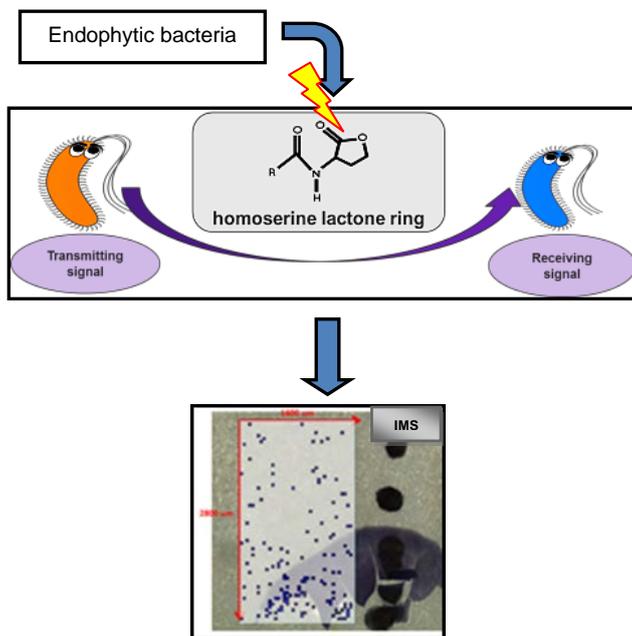


Figure 1. Schematic representation of quenching of quorum coordination by bacterial endophytes of *Cannabis sativa* L.

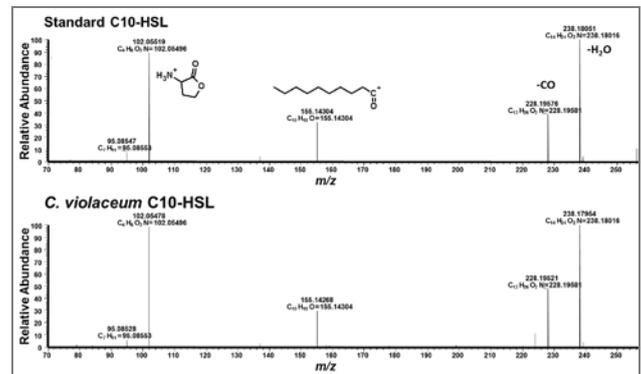


Figure 2. Representative MS/MS spectra showing comparison of C10-HSL in authenticated standard (top) and in the control biosensor strain (bottom)

Our previous work on the attack-defense-counter-defense strategies of the endophytic fungal community revealed their potential as biocontrol agents. Therefore, we further our investigation to study the ecological context of the bacterial endophytes in providing host fitness benefits. In this study, we use a combination of high performance liquid chromatography high-resolution mass spectrometry (HPLC-ESI-HRMs) and matrix assisted laser desorption ionization imaging high-resolution mass spectrometry (MALDI-imaging-HRMS) to quantify and visualize the selective and differential quorum quenching capability of potent bacterial endophytes harbored in *Cannabis sativa* L. plants.

Our work provides fundamental insights into the potential of endophytic bacteria as biological tools for biocontrol of phytopathogens and as antivirulent agents both within the ecological context and clinical settings.

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Publications:

- [1] Kusari P., Kusari S., Lamshoef M., Sezgin S., Spiteller M., Kayser O. (2014) Quorum quenching is an antivirulence strategy employed by endophytic bacteria. **Submitted**
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