

## Germination effects on diversity of seed-associated bacteria

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### Abstract

The plant-microorganism interaction is specific to certain species of plants and/or bacteria. In the last few years the studies of endophytic microbial diversity have been studied in many plant species, mainly focusing at understanding the diversity and biotechnological potential of this community. In this interaction, both the host plant and endophytes may be benefited by the exchange of nutrients and protection. However, there is a lack of information regarding bacterial diversity seed-associated and how the germination stages affect the endophytic community. Thus, in the present work, we assessed the endophytic bacterial community inside of *Eucalyptus* seeds and germination effects on diversity and colonization. Endophytic seed-associated bacteria were assessed in *Eucalyptus citriodora*, *E. urophylla* and the hybrid *E. globulus* x *E. grandis* by isolation and DGGE techniques. Additionally, analysis was performed by scanning electron microscopy (SEM) and transmission electron microscopy (TEM) at different seed germination stages. The results showed that the endophytic bacterial density did not differ among *Eucalyptus* species. This bacterial community is composed by Actinobacteria, Proteobacteria and Firmicutes. In addition, *Bacillus megaterium* and *Williams* sp. were the most frequent bacteria in seeds of *E. citriodora* and *E. globulus* X *E. grandis*. The germination stages increased the bacterial density and diversity, suggesting that germination can activate the seed-associated bacteria. The cell walls and membranes were not affected during germination stages assessed. Therefore, we suggest that bacterial community is activated by seed germination allowing the settling inside the seedlings. These bacteria could be associated to plant protection during environmental establishment.

Keywords: Plant-microbe interactions; Microscopy; DGGE; Germination