Isolation and Characterization of Endophytes from Cordyline fruticosa

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Endophytes are bacteria and fungi that live inside plant tissues, often acting in mutualistic relationships by producing beneficial compounds. Leaf tissues of Cordyline fruticosa (ti) were obtained and the endophytes within were isolated and characterized. A total of seventy endophytic isolates were obtained. In an antibacterial disk assay, nine bacterial and fungal isolates inhibited the growth of Micrococcus luteus, Bacillus subtilis, and Branhamella catarrhalis. Subsequently, a growth curve of one antibacterial endophytic bacterium identified as Bacillus pumilus (thought to be a novel endophyte discovery in Cordyline fruticosa), was constructed to test its bioactivity in liquid cultures of B. subtilis. The live endophyte and its cell-free supernatant were used. Both B. subtilis experiments were statistically significant in inhibiting growth, shown at the final absorbance reading ($p<0.05$). Additionally, thirteen bacterial endophytes and thirteen fungi were tested for their ability to produce indole-acetic acid (IAA), a plant-growth hormone. Four bacteria and four fungi demonstrated high capabilities of producing IAA (ranging 9.3 – 115.0 µg/mL) and were subsequently tested for their ability to colonize or improve the germination of radish seeds by soaking them in endophytic suspensions for fifteen hours and plating them on wet germination paper. Results show the potential enhanced germination and growth by three endophytes (one bacterium, two fungi) in radish seeds. Further identification and research into the colonizing ability of these endophytes should be done to better understand their role in the ti leaf microbiome and their potential roles in the microbiomes of other plants.

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