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ABSTRACT
BOOK

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ID481 | Plant Growth-Promoting Bacteria Recovered from Winery Wastes

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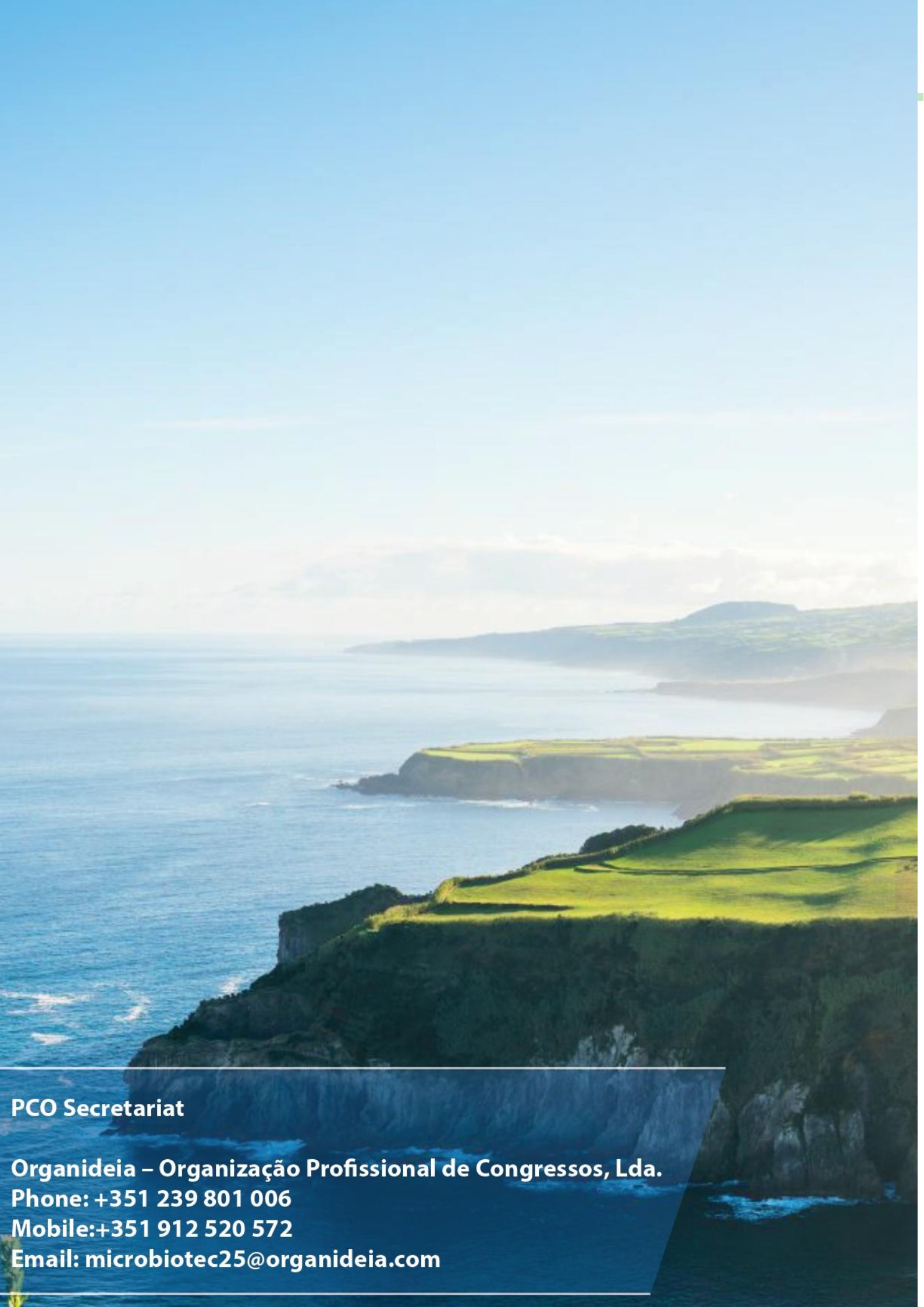
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Background: Wine industry generates by-products including grape stalks and washing sludge which are often burned, thus becoming an economically and environmentally unsustainable practice. A promising alternative is to reuse these wastes through composting. Isolating plant growth-promoting bacteria (PGPB) from composted wine residues represents a valuable strategy, as both PGPB and compost may enhance plant growth and soil health. This study aimed to isolate and identify bacteria from different composting piles and assess their ability to produce plant growth-promoting (PGP) substances.

Methods: Several bacterial isolates were isolated from composting piles using the serial dilution method and grown in specific culture media (e.g. King B). Seventy-four isolates were characterized according to Gram staining, cytochrome oxidase and catalase activities. In addition, their capacity to produce PGP substances (e.g. P solubilization, N₂ fixation) was evaluated. Based on their ability to produce PGP substances, 23 isolates were screened for indol-3-acetic acid (IAA) production and identified using 16S rRNA sequencing. **Results:** The 16S rRNA sequencing revealed that nearly 40% of the isolates were identified as *Bacillus*, followed by 26% as *Pseudomonas* and 13% as *Cytobacillus*. Isolates exhibiting the highest IAA production belonged primarily to the genera *Bacillus*, *Brevibacillus* and *Agrobacterium*, highlighting their potential as key PGPB. Additionally, results showed that nearly 11% of the isolates presented multiple PGP traits, including P solubilization, N₂ fixation, and siderophores production. Only 7 isolates were able to synthesize multiple extracellular enzymes.

Conclusions: Composting of sludge and wine stalks from wine industry enabled the isolation and characterization of several bacterial strains with potential as plant growth promoters.

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