

**TITLE:** INVESTIGATION OF BACTERIAL SOIL ISOLATES WITH ANTIMICROBIAL ACTIVITY POTENTIAL

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**ABSTRACT:**

Soil microbial diversity is responsible for the production of hundreds of substances, as enzymes, polymers, and antibiotics, making the soil an important reservoir of these molecules. However, despite many commercially available antibiotics, their use is not enough to avoid the emergence of bacteria resistant to antibiotics of different classes. Therefore, a great challenge is the discovery of new molecules with antimicrobial activity. The goal of this study was to investigate environmental isolates capable of producing antimicrobial molecules against species of clinically important bacteria. In a previous work, 45 bacterial isolates were obtained from Brazilian agricultural soils and identified as belonging to the genera *Brevibacillus*, *Paenibacillus*, and *Bacillus*. These isolates were inoculated as a single straight streak onto Muller-Hinton agar, after 48 hours at 30°C for, the indicator bacteria were inoculated perpendicularly to the growth of isolate and incubated at 37°C. Twenty-two isolates were able to inhibit the growth of some indicator bacteria. After that, the culture supernatants of these isolates were used to gout diffusion method (10, 20, and 30 µl) on Muller-Hinton agar. Eight isolates presented antimicrobial activity, being that isolates S218 and S214 stood out inhibiting at least 11 and 8 indicator bacteria, respectively. By Minimum Inhibitory Concentration and Minimum Bactericidal Concentration methods, the isolate S214 showed a potential for bactericidal activity against *Streptococcus mutans*, and isolate S218 presented a potential for bactericidal activity against two indicators bacteria, *Burkholderia cepacia* and *Staphylococcus aureus*. Additionally, it was observed a significant reduction of the viability of other indicator bacteria. Until the moment, the present study revealed two bacterial isolates, which showed a promising antimicrobial activity.

**Keywords:** Antimicrobial molecules, Soil isolates, Antimicrobial activity

**Development Agency:** CAPES and FAPESP