

TITLE: ISOLATION OF BIOACTIVE COMPOUND PRODUCED BY *Burkholderia metallica* RV7S3 STRAIN WITH POTENTIAL FOR PHYTOPATHOGENIC FUNGUS CONTROL

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ABSTRACT:

The search for new antimicrobial compounds is one of the main challenges of nowadays. The indiscriminate use of antibiotics in clinical cases and the uncontrolled applications of fungicides and bactericides in the agricultural sector causes considerable public health and environmental problems. The *Burkholderia* genus is known for the biosynthesis capacity of several antimicrobials with potential to control human and plant pathogens. This study aimed was the isolation of a metabolite produced by *B. metallica* RV7S3 and the analyses of the antibacterial and antifungal activity of these bacteria against isolates of agricultural and clinical interest. The strain was isolated in the municipality of Itararé-SP and identified by sequencing of the 16S rRNA. 1 L of nutrient broth (NB) were inoculated with 1 mL of cell suspension (1.5×10^8 CFU mL⁻¹) and incubated during 6 days under 150 rpm and 28°C. The supernatant was obtained by centrifugation (9.000 rpm during 20 min) and then collected. The pellet was discarded. Three liquid-liquid partitions were performed with dichloromethane and the dichloromethane extract (DE) was separated and concentrated in a rotary evaporator. DE was fractionated by flash chromatographic column for purification of the active metabolites and the fraction of interest was characterized in high performance liquid chromatography (HPLC) (Zorbax 40 SB C-18 5 µm / 4.6 x 250 mm, with gradient of H₂O and acetonitrile (Acn) as the mobile phase). The substance tested has a retention time of 17.2 min on HPLC analysis and was verified antifungal activity against *Rhizoctonia solani*, *Mycosphaerella fijiensis*, *Sclerotinia sclerotiorum* and *Alternaria alternata*, anti-yeast against *Candida albicans* and antibacterial against *Staphylococcus aureus* in disc-diffusion assays performed with the concentrations of 15 and 50 µg disc⁻¹. The best antimicrobial activity was obtained against *R. solani* (18 mm with 15 µg and total inhibition with 50 µg), and a minimum inhibitory concentration (MIC) test was performed with this microorganism. The MIC was 1.56 µg mL⁻¹ and the minimal fungicide concentration was 25 µg mL⁻¹. The compound has high potential to be used as an alternative to commercially available antimicrobials, especially to agricultural fungicides because it has high selectivity to phytopathogenic fungi.

Keywords: antifungal, *Rhizoctonia solani*, chromatography methods.

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