Using Microbial Metabolites to Develop an Alternative to Combat Klebsiella pneumoniae carbapenemase (KPC)

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Bacterial resistance refers to the ability of bacteria to multiply even in the presence of antibiotics, making infections caused by these microorganisms difficult to combat. Albeit a natural biological process, the unregulated use of antibiotics has clearly accelerated bacterial resistance. The incorrect and indiscriminate use of antibiotics in humans and animals has resulted in an artificial selection of "superbugs", organisms that have appeared more and more frequently. Bacteria develop this kind of resistance at a faster rate than we have been able to discover and make new drugs. According to the World Health Organization (WHO), bacterial multidrug-resistant infections cause about 14% of hospital deaths. Therefore, the present project aimed to develop a new alternative based on natural compounds to combat the multi resistant bacterium Klebsiella pneumoniae carbapenemase (KPC). In order to accomplish that, direct confrontation tests were performed using 9 antagonistic bacteria (RV1R2, S1, S2, S3, MV1, MV2, MV3, MV4 and MV5) from natural soils. From the direct antagonism test, I have selected four bacteria that presented the best results (MV5, S1, S3 and RV1R2) for production and well tests. I have used the bioautography test and Minimum Inhibitory Concentration only on the RV1R2 bacteria, showing that it is necessary to use 250 µL / mL of the compound produced by the RV1R2 bacterium for the elimination of multi resistant bacteria. This study shows that it is possible to develop an alternative, derived from natural compounds, to combat KPC.

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