ANTIBACTERIAL ACTIVITY OF COMPOUND ISOLATED OF PIPER ADUNCUM AND NISIN ON ALICYCLOBACILLUS ACIDOTERRESTRIS

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Alicyclobacillus acidoterrestris is a bacterium Gram-positive aerobic. This bacterium resists pasteurization temperature and low pH, and is usually related to the spoiling of reconstituted orange juice. Another process should be added to the thermal treatment for the spoilage produced by the microorganism since high temperature may cause the loss of the product’s sensorial and nutritional characteristics. The objective of this study was evaluates the antibacterial activity of Piper aduncum and nisin on Alicyclobacillus acidoterrestris and subject to the isolation of pure compound. The Minimum Inhibitory Concentration (MIC) and the Minimum Bactericide Concentration (MBC) were determined by broth microdilution method by a twofold dilution. P. aduncum was fractionated by adsorption chromatography to obtain the compound pure. Bactericide activity of the pure compound was confirmed by the time-kill curve. The morphological changes of A. acidoterrestris were evaluated by Scanning Electronic Microscopy. Six fractions were obtained and the dichloromethane fraction (F.3) had the lowest MIC/MBC (7.81 μg/ml). Nisin and P. aduncum showed good antibacterial activity with MIC and MBC of 15.63 and 31.25 μg/ml respectively. The dichloromethane fraction was again fractionized and the purified compound (F.3.7) obtained. Spectrum analysis showed that the compound was prenylated chromene with MIC and MBC 7.81 μg/ml and showed changes in the morphology of A. acidoterrestris. Prenylated chromene was isolated and identified as the main antibacterial compound of P. aduncum. Current study suggests natural extracts as an alternative for food bio-preservatives.