

Antimicrobial effects of rhizophora apiculata pyroligneous acid against pathogenic microorganisms

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Abstrak

The antimicrobial effects of rhizophora apiculata pyroligneous acid on pathogenic microorganisms were evaluated. Pyroligneous acid (PA) and concentrated pyroligneous acid (CPA) showed various levels of antimicrobial activity against 14 species of microorganisms (10 species of bacteria, 2 species of yeasts and 2 species of fungi) with bacteria, as the most susceptible microorganisms. The bio-active component(s) of PA was isolated using dichloromethane as the extraction solvent (resulted in DCM A) and also an acid - base treatment to DCM A (resulted in DCM B) which was believed to contain all the valuable phenolic compounds in PA. Antimicrobial screening on DCM A and DCM B showed significant activity against all the microorganisms tested. DCM B was further subjected to MIC/MLC (Minimum Inhibitory Concentration and Minimum Lethal Concentration) and SEM studies. The results showed that bacteria were the most susceptible against DCM B with MIC/MLC value of 1.6-3.1/3.1-6.3 mg/ml, while yeasts and fungi shared the same MIC/MLC value of 3.1/6.3 mg/ml. The SEM study revealed that in addition of inhibiting the growth of the microorganisms, DCM B also caused severe morphological alterations on the cells of the microorganisms in which it was suggested that cell lysis and death had taken place.