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Abstract

Nowadays, the medical concerns with Methicillin-resistant *Staphylococcus aureus* (MRSA) arised when in 2009, the proportion of *S. aureus* isolates that are resistant to methicilin has increased to 59.5%- 64.4% in South East Asia. Hence a new antibacterial agent from natural source is necessary to combat the infectious diseases. This study aimed to investigate the anti-MRSA activity of the endophytic fungus *Penicillium minioluteum* ED24, which was previously isolated from the leaf of the medicinal plant *Orthosiphon stamineus* Benth, in Penang, Malaysia. Methanol was used to extract the freeze-dried fungal biomass of the 14-days old fungal culture. The extract showed very significant anti-MRSA activity of disc diffusion assay with the minimal inhibitory concentration of 31.3 mg/mL and minimal lethality concentration of 250 mg/mL. Besides, 50% growth reduction of MRSA was observed at 33.2 h at the concentration of extract at MIC and 26.7 h at concentration of 2MIC. The structural degeneration of MRSA was observed by using scanning electron microscope (SEM). The SEM micrographs showed that the formation of cavities were observe on the extract treated cells and the cell wall structure of the MRSA was collapsed after treated with the fungal extract. The results suggesting that the bacterial cell wall is the target of the antibiotic compound(s) present in the extract. These results reveal that the endophytic fungus *P. minioluteum* ED24 a is potential source of anti-MRSA compounds.

Keywords: Anti-MRSA activity, endophytes, *Penicillium minioluteum*, *Orthosiphon stamineus*.