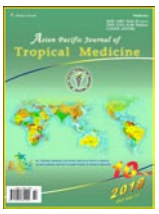

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Bacillomycin D-like compounds isolated from *Bacillus amyloliquefaciens* HAB-2 are effective against *Burkholderia pseudomallei*

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ABSTRACT **Background:** *Burkholderia pseudomallei* (Bp) is a gram-negative environmental bacterium that causes melioidosis. It has high mortality and relapse rates regardless of powerful antibiotic therapy. Bacterial pathogens display versatile gene expression to adapt to changing surroundings, especially when they are infected by drugs. A cyclic lipopeptide was isolated from *Bacillus amyloliquefaciens* HAB-2, which is a bacillomycin D-like compound, named as bacillomycin DC. It is a potent fungicide against *Colletotrichum gloeosporioides* Penz. **Methods:** We used this kind of bacillomycin DC to be inhibitor of Bp and in order to find out how does it infect the bacterial pathogens. We observed the morphological changes under transmission electron microscope (TEM) and scanning electron microscopy (SEM) when BP is in the minimum inhibitory concentration (MIC) of ceftazidime and bacillomycin DC. Then we used quantificationgene Real-Time PCR (qRT-PCR) to measure the expression of three drug-assistant genes including *MexB*, *qnrS* and *oprD2,* respectively. **Results:** Bacillomycin DC treatment caused changes in the shape and microstructure, and the bacterial outer membrane were damaged, the leakage of the cell were observed. The expression level of *mexb* gene was not high until 72h after ceftazidime and bacillomycin DC treatment. Both ceftazidime and bacillomycin DC caused high expression of *oprD2*, but higher expression level proves that the DC works more efficiently and quickly. Bacillomycin DC increased the expresssion level of bacteria *qnrS* gene in 24 h, which proved this compound injured the DNA helicase and topoisomerase of the bacteria in a short time. The results showed that the bacillomycin DC had better inhibitory effects. We also found out that different mechanism of action between ceftazidime and bacillomycin DC. **Conclusion:** The bacillomycin DC makes bacterial pathogen display more *oprD2* and *qnrS*, which respectively means bacterial pathogen are sensitive to the bacillomycin DC and its DNA gyrase are injured. In short, our study showed for the first time that bacillomycin DC can inhibit Bp in a short time.

Keywords: *Burkholderia pseudomallei*; Bacillomycin DC; Ceftazidime; MIC; Inhibitory effect; Quantitative Real-Time PCR

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