

Project Title: Study on the geographical distribution of *Burkholderia pseudomallei*, and interference of environmental factors for the distribution of this bacterium in Taiwan

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Abstract:

Melioidosis, an emerging disease, caused by *Burkholderia pseudomallei*, is a fatally infectious disease. Melioidosis had been occurred outbreak in 2005 in Taiwan. Human acquired melioidosis is via directly subcutaneous inoculation or pulmonary inhalation of soil or dust containing *B. pseudomallei*. Thus, this project aimed to survey the geographical distribution of *B. pseudomallei* in Taiwan. The soil at a depth of 300-600mm was sampled following as both sides of national or province roads every 5-10 km. Results indicated that Ren-Der (Tai-Nan), Mein-Chou (Ping-Tong), Shui-Shang (Chiayi) and Feng-Yuan (Tai-Chung) was 26.6% and 29.7%, 10.0% and 25.0%, 5.2% and 12.5%, and 4.5% and 11.3% of isolation- and PCR-positive rate, respectively. Although 1.6-13.6% of PCR-positive rate was detected in other area, no culturalbe *B. pseudomallei* were found in these areas. A total of 26 strains, have been identified to *B. pseudomallei* with biochemical and molecular diagnosis, were typed using RAPD (randomly amplified polymorphic DNA) methods. The isolates from Ren-Der, Mein-Chou and Shui-Shang were shared with same RAPD types, but theolates from Feng-Yuan exhibited independent type. Some strains were harbored with CAT/GGC heterozygous characteristics in 16S RNA gene sequences. Results indicated that the isolates from Taiwan had independent molecular features, which were different from the isolates from international. However, the unevenly distribution of *B. pseudomallei* in Taiwan was affected by several physical, chemical and biological factors. The isolates of *B. cepacia* genomovar IIIa were widely distributed in cropped field in Taiwan. Among of them, 7.4% of isolates were capable of inhibiting the growth of *B. pseudomallei*. In the media mimicking adverse circumstances, for example, change of pH value, temperature and salt concentration, the adaptive abilities of *B. cepacia* were better than those of *B. pseudomallei*. This is one of reasons to explain why the geographical distribution of *B. pseudomallei* in Taiwan is uneven.

Key words : *Burkholderia pseudomallei* 、 geographical distribution 、 biological antagonistic 、 environmental factors