

Isolation of Antibiotics Producing Soil Bacteria in Taiwan Intertidal Zones

Ya-Ping Jang, Chih-Chuang Liaw, Chi-Hsin Hsu*

Department of Marine Biotechnology and Resources, National Sun Yat-sen University, Kaohsiung 804, Taiwan

Keywords: sediment, marine-derived microbes, antibiotic, secondary metabolites

Since the discovery of the first antibiotics, penicillin, by Alexander Fleming in 1928, many more, such as cephalosporins, aminoglycosides, tetracyclines, etc., were isolated from microorganisms. However, due to misuse or abuse of antibiotics, resistant pathogens become serious threats to human health. The possibilities of finding new drugs from the terrestrial based origins and exhausted. On the other hand, the under exploited marine environments may provide new sources of anti-microbial compounds. In this study, marine-derived bacteria with antibiotic activity from Taiwan intertidal zones by the flip-flop agar-diffusion method was used to screen for new antibiotics.

Sediment samples from the underwater hot springs of Gueishan Island and mud from the intertidal zones of Ma-kung Island (Peng-Hu), Da-Peng Bay (Ping-tung), Ken-ting (Ping-tung), and Little Liuchiu. A total of 289 marine-derived microbes, of which 43 showed the antibiotic activities against 7 indicator bacterial strains, *Bacillus cereus*, *Staphylococcus aureus*, *Klebsiella pneumonia*, *Salmonella typhimurium*, *Pseudomonas aeruginosa*, *Vibrio harveyi*, and *Escherichia coli*. The 43 isolates were grouped into 9 *Bacillus spp.*, 1 *Virgibacillus sp.*, 31 *Pseudoalteromonas spp.*, 1 *Vibrio sp.*, and 1 *Streptomyces sp.* based on 16S rRNA sequences. Among the isolates, all the *Pseudoalteromonas spp.* and *Vibrio sp.* require added salts for growth. Some of the isolates with stronger or broader spectra activities were chosen for further investigation on the optimal conditions of the production of the active compounds. Strain QWI06 (*Vibrio sp.*) from Da-Peng Wan showed the highest inhibitory effects when grown at 30 °C for three days. The purification and structural elucidation of the active ingredients are currently in progress.