

以 LC-PDA-MS 對海洋真菌 *Trichoderma* spp. 之抗菌成份進行 Molecular Networking 分析

Yi-yu, Chen(陳儀諭), Chih-Chuang Liaw*

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

Abstract:

Marine covers nearly three-quarters of the earth surface, and the environments inside are unique, including deep sea volcanic area, the Dead Sea, estuaries, intertidal zones, wetlands and other special circumstances. Marine fungi are widespread in such environments so that marine fungi are speculated to possess different secondary metabolism from terrestrial fungi. Besides, more and more literatures indicated that marine fungi produce a variety of novel compounds, for example cephalosporin C from marine fungus *Acremonium chrysogenum*. Till now, cephalosporin C has been synthesized more than 30 derivatives, and some of them become commonly used antibiotics. These results indicated marine fungi are worth to further research and development of new drugs.

Marine fungus, *Trichoderma reesei*, was isolated from a sponge collected in Wan-Li Tong, Pingtung County. In the preliminary biological activity screening against eight bacterial indicators and one fungal indicator, *Trichoderma reesei* showed clearly inhibitory effects against *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Bacillus cereus*, *Acinetobacter baumannii*, and *Candida albicans*. Therefore, we will analysis the fungus *T. reesei* by LC-PDA and LC-MS/MS molecular networking. Molecular networking analysis, which can organize MS signals with the similar fragmentation pattern together, is used to quickly classify the types of compounds. We plan to use this new strategy to search bioactive/novel compounds from this marine fungus.

海洋佔了地球近四分之三表面積，且海洋環境十分獨特，例如：深海的火山區、死海、河口、潮間帶、濕地等特殊環境。海洋真菌廣泛存在這些環境，可推測其具有異於陸生真菌的代謝途徑。隨著海洋真菌化合物研究的進展，越來越多實驗證明海洋真菌可產生多樣化的新穎化合物，例如：來源於海洋真菌的頭孢菌素 C，經開發利用，陸續成為常用藥的合成衍生物約 30 種。這些成果顯示出海洋真菌是一個值得去深入研究並進行新藥開發的主題。

我們自屏東萬里桐所採集到的海綿 *Niphat* sp. 中分離到一株海洋真菌，經 18S rRNA 為 *Trichoderma reesei*，且由生物活性篩選顯示 *Trichoderma reesei* 對 *Staphylococcus aureus*、*Pseudomonas aeruginosa*、*Bacillus cereus*、*Acinetobacter baumannii*、*Candida albicans* 具有抑制活性。

我們並利用 LC-PDA-MS 及分子網絡 (Molecular Networking) 進行分析這兩株真菌之有機萃取物。Molecular networking 是一個用來快速的分析及分類出其分析物中所含之化合物的種類及片段，我們期望能藉此分析技術以快速搜尋出海洋真菌產之具抑制活性化合物，再進一步進行放大培養與分離出具有抑制病菌活性的新型化合物。