

Studies of Salt Concentration Dependent Compounds Produced by Endophytes of Salt-Tolerant Plants

Yoshihito Shiono, Takuya Koseki

Department of Food, Life, and Environmental Science, Faculty of Agriculture, Yamagata University

Summary

Mangrove forests area are distributed in most tropical and subtropical coast regions of the world. Some of the potency of mangrove plants may be due to mutualistic endophytes fungal associated with host plants. In fact, some chemical materials are isolated from the fermentation broth of endophytes from mangrove plants. These fungi such as producing chemical materials are adapted to sodium chloride (NaCl). It could be shown that NaCl has a profound influence on the regulation of secondary metabolites biosynthesis in fungal species. In this project, we started a research program to discover the endophytic fungi from mangrove plants that show the growth increase of secondary metabolites under the NaCl including fermentation condition. Over 100 fungal strains were collected from the twigs and petiols of mangrove plants at Muara angke, Jakarta, Indonesia, on NaCl supplemented agar plate. The AcOEt extracts obtained from these cultures have been done by TLC analysis. Then, two fungal strains, IM-26 and IM-33 were selected because of large productivity or characteristic of secondary materials profile in the NaCl including fermentation condition (exposed salt stress). TLC-guided fractionation of the extract resulted in the isolations of altenuene (**1**) and compound **2** from IM-26 strain and 12-*O*-monodeacetylphomaxanthone A (**3**), cytocharasins H (**4**), and J (**5**) from IM-33 strain, respectively. These structures were elucidated by spectroscopic methods (1D, 2D NMR and MS) except for compound **2**.

Although altenuene (**1**) and compound **2** do not contain a chloride atom, altenuene (**1**) and compound **2** biosynthesis increased under the 3% NaCl concentration in fermentation condition. The biosynthetic pathways of them could be activated by NaCl in this species. These endophytic fungi live within plant tissues without causing visible damage to the host plant may protect plants directly or indirectly through a using these compounds produced by fungi activated by NaCl.