

Siangjeaw Piriyaopin 2014: Biodiversity of Halophilic Fungi and Antagonistic Activities Against Some Plant Pathogenic Fungi. Doctor of Philosophy (Tropical Agriculture), Major Field: Tropical Agriculture, Faculty of Agriculture.  
Thesis Advisor: Professor Leka Manoch, Ph.D. 119 pages.

Sixty one soil samples, thirteen *Acacia* leaves samples and nine samples of organic residues were collected from 2 Provinces in Thailand on November 2008 to December 2010. For isolation of the fungus, soil samples were isolated using the soil plate and soil dilution plate methods on Gochenaur's glucose ammonium nitrate agar and potato dextrose agar supplemented with 10% sodium chloride and incubated at 28°C for 5-7 days. Fungal identifications were based on morphological characters under light and scanning electron microscopes and 18 S rDNA sequences. Four species of halophilic, endophytic fungi including *Fusarium equiseti*, *Fusarium* sp., *Lasiodiplodia pseudotheobromae* and *Nectria rigidiuscula*, were isolated from leaves of *Acacia ampliceps* Maslin (Family Fabaceae) obtained from the areas of highly saline soil (pH 9.2) at Amphoe Kham Thale Sor, Nakhon Ratchasima Province, Thailand. The fungi were characterized for their *in vitro* antagonistic activity and for enzyme production. *F. equiseti* and *N. rigidiuscula* were tested against seven species of plant pathogenic fungi in dual cultures on PDA. These two species inhibited 100% mycelium growth of *Phytophthora palmivora* and 80-92% mycelium growth of *Pythium aphanidermatum*, *Curvularia oryzae*, *Colletotrichum capsici* and *Rhizoctonia solani* but showed only moderate activities against *Helminthosporium oryzae* and *Alternaria brassicicola*. Regarding enzyme production, *F. equiseti* strongly digested lipid, whereas *N. rigidiuscula* strongly degraded phosphate and lipid and slightly degraded protein.

In another investigation, four species of alkaliphilic fungi including *Fomitopsis ostreiformis*, *Scytalidium hyalinum*, *Termitomyces cartilagineus* and *Trichoderma virens* were found from organic residues of *Acacia ampliceps* obtained from the moderately and highly saline soil (pH 8.7-9.6) at Amphoe Kham Thale Sor, Nakhon Ratchasima Province and Amphoe Ban Pai, Khonkean Province. In dual cultures test, these four species inhibited 67-100% mycelium growth of *Alternaria brassicicola*, *Helminthosporium oryzae*, *Colletotrichum capsici*, *Pythium aphanidermatum* and *Rhizoctonia solani*. In addition, *Trichoderma virens* inhibited 100% mycelium growth of *Phytophthora palmivora*. These organisms also possessed cellulase, protease, phosphatase and lipase activities. *T. virens* rapidly produced cellulase and showed strongly activities in degrading cellulose, phosphate and lipid. *In vitro* antagonistic test revealed that *T. virens* suppressed *Phytophthora* foot rot and *Rhizoctonia* leaf blight of durian at the Orchard of Development Royal Project Center, Amphoe Thamai, Chantaburi Province. After foliar spray of *Trichoderma* inoculums ( $10^6$ /ml) 10 litre per durian tree every 15 days for 6 months, the rotten bark tissue of durian recovered dried and producing the healthy bark as were as javum leaves young. Furthermore, the *Trichoderma* hypha and conidia alive in the plant cells of cork and cortex inner tissue of the host plant layers of durian fibrous root.

---

Student's signature

---

Thesis Advisor's signature