



CHAPTER I

INTRODUCTION

Microbes, especially fungi have been widely used as food, food additive, microbial insecticide and sources of antibiotic or bioactive compounds. Examples are mushroom, yeast (food), *Penicillium candidum* (food additive), *Metarhizium anisopliae* (microbial insecticide), *Penicillium chrysogenum* (penicillin), *Cephalosporium acremonium* (cephalosporin), *Penicillium griseofulvum* (griseofulvin), *Monascus ruber* and *Aspergillus terreus* (lovastatin) (Moore-Landecker, 1998). Fungi play important role in biodiversity because they have world wide distribution and successfully exploit many different habitats (Isaac, 1992). Approximately 64,000 species of fungi have been described and estimated fungi are 1,600,000 species (Charlie and Watkinson, 1994). Fungi have been surveyed in various sources such as soil, marine, fresh water, litter, dung and decaying remains of plants and animals. Living plant is an interesting source for screening of new microorganisms. Fungi from special source like plant may also produce novel compounds possessing biological activities.

Endophytic fungi are fungi that live internally and symptomlessly within the living tissues of plant host (Strobel and Long, 1998). In the last decade, the interest for endophytic fungi as potential source of novel bioactive compound has increased. Isolation of paclitaxel (Taxol[®], anticancer drug from Pacific yew bark) from *Taxomyces andreanae*, an endophytic fungus of pacific yew *Taxus brevifolia* bark is the popular model (Strobel *et al.*, 1993).

In this research, *Annona reticulata* L. leaf (Annonaceae) was employed as a plant source of fungi because *A. reticulata* is regularly used as Thai medicinal plant, having pharmacological activities such as insecticide, antirheumatism, antispasmodic and insect repellent. During the course of study, the endophytic fungus isolate ARE-1 was isolated from a surface-sterilized leaf of *A. reticulata* collected from a botanical garden of the Faculty of Pharmaceutical Sciences, Chulalongkorn University, Thailand. The isolate ARE-1 was explored for secondary metabolites. Chemical structures of the secondary

metabolites was elucidated by spectroscopic method and the isolated fungus was classified based on morphology and nucleotide sequence of ITS1-5.8S-ITS2 regions of rDNA.

The main objectives of this investigation are as follows:

1. Isolation and characterization of secondary metabolites of the endophytic fungus isolate ARE-1 from *A. reticulata* leaf.
2. Identification of the endophytic fungus isolate ARE-1.
3. Evaluation of biological activities of the isolated compounds.



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