



CHAPTER I

INTRODUCTION

Secondary metabolites of microorganisms, in particular fungi, are important sources of bioactive compounds. Fungal secondary metabolites are a diverse group of compounds produced by a wide range of different fungi. Fungi are accomplished chemists that produce a wide range of complex organic molecules with important applications in the pharmaceutical industry (Tan and Zou., 2001).

Aspergillus species are widely found in environment. *Aspergillus variegator* syn. *Aspergillus stellatus*, anamorph of *Emericella variegator* (Powell et. al., 1994), is one of *Aspergillus* species which produces a variety of natural products. A large number of metabolites in polyketide-terpenoid pathway have been isolated from different strains of *A. variegator* including terrein (1) (Dunn et. al., 1975; Malmstrom et. al., 2002), 2-methoxy-6-(3,4-dihydroxyhepta-1,5-dienyl)benzyl alcohol (2) (Dunn and Johnstone, 1979; Malmstrom et. al., 2002), bistetrahydrofuran (asteltoxin) (3) (Kruger et. al., 1979; Steyn and Vleggaar, 1984), coumarin (4,7-dimethoxy-5-methylcoumarin) (4) (Chexal et. al., 1975^c), anthraquinones (emodin) (5) (Bringmann et. al., 2003), xanthones (tajixanthone) (6) (Ahmed et. al., 1992; Bringmann et. al., 2003; Chexal et. al., 1994^{a,b}; Chexal et. al., 1975^{a,b}; Fujimoto et. al., 2006; Holker et. al., 1974; Kralj et. al., 2006; Malmstrom et. al., 2002; Pornpakakul et. al., 2006) and sesterterpenoids (astellatol) (7) (Bartlett et. al., 1981; Chexal et. al., 1976; Cutler et. al., 1984; Dunn et. al., 1976; Dunn et. al., 1978; Dunn et. al., 1979; Hensens et. al., 1991; Holker and Simpson 1978; Kosemura et. al., 1994; McIntyre et. al., 1982; McIntyre et. al., 1986; Li et. al., 2005; Simpson, 1979; Simpson, 1981; Simpson and Walkinshaw, 1981; Simpson et.al., 1982; Simpson, 1994; Simpson et. al., 1997; Springer et. al., 1979; Wei et. al., 2004). The major groups of the metabolites of the fungus are xanthones and sesterterpenoids (e. g. meroterpenoids of mixed polyketide and terpenoid origins).

Secondary metabolites of *A. variegator* cultured in different media have been reported. A large number of sesterterpenoids including 6-*epi*-ophiobolin G (8), 6-*epi*-ophiobolin N (9) and shimalactone A (10) could be produced from *E. variegator* GF10

cultured on malt extract glucose medium and those was used rice solid medium (Wei et. al., 2004). Evariquinone (11), isoemicellin (12) and stromemycin (13) were produced from *E. varicolor* cultured in WSA liquid medium (Bringmann et. al., 2003). Four xanthenes produced from mycelium of *E. varicolor*, an endophytic fungus from *Croton oblongifolius* cultured in malt extract glucose liquid medium (Pornpakakul et. al., 2006). Since the secondary metabolites of *E. varicolor* obtained from different culture media are different it is suggested that the secondary metabolites produced by *E. varicolor* should depend on culture media.

Recently, metabolites of an endophytic fungus, *Emericella varicolor*, of *Croton oblongifolius* were investigated. Four xanthenes including shamixanthone (14), 14-methoxytajixanthone-25-acetate (15), tajixanthone methanoate (16) and tajixanthone hydrate (17) were isolated from mycelia of *E. varicolor*. All of them showed moderate activities and 14-methoxytajixanthone-25-acetate (15) and tajixanthone hydrate (17) was selective against gastric carcinoma and breast carcinoma. Comparison of metabolites of the endophytic *E. varicolor* with others terrestrial *E. varicolor* the metabolites of the endophytic *E. varicolor* were not the same. Thus, the endophytic fungus, *E. varicolor* cultured in different media may produce a variety of metabolites and provide novel biologically active compounds due to endophytic fungi are the rich sources of novel compounds (Pornpakakul et. al., 2006).

Therefore, aim of this project will investigate the effect of culture media on secondary metabolites production and biological activities of isolated metabolites from endophytic fungus, *E. varicolor* isolated from *Croton oblongifolius*.