

## CHAPTER I

### INTRODUCTION

Giant galanga (*Alpinia* spp.) is the member of Zingiberaceae family. It had originated in South East Asia, probably southern China; it is now cultivated in Indochina, Thailand, Malaysia and Indonesia. Galanga is a very popular spice in whole South East Asia and especially typical for the cuisine of Thailand. This plant is also known and used in Malaysia, Indonesia, Cambodia, Vietnam and Southern China. Chinese *five spice powder* is sometimes enhanced with galanga. In Western countries, however, galanga is not well known, at least in our days; it has, however, been a valued spice in the early Middle-ages.

In Thailand, *Alpinia* spp. is the most important edible genus with *A. galanga* being the most important species that its rhizome is used not only as a common spice for flavor soups and many other dishes but also as a medicinal and aromatic plant (Mokkhasmit, 1971). The properties of drug, the active chemical in galanga which could inhibit the growth of microorganism is eugenol, cineole and camphor. The essential oil could abate the stomachache. Chinsiriwong and Herunkan (1983) and Autchararit *et al.* (1983) reported that the extract of galanga using methanol (95 percent), chloroform and petroleum ether could also decrease swelling and kill the growth of fungi *Microsporum gypseum* and *Trichophyton rubrum* which caused the skin disease.

Srisornkopol (1996) and Lertvirasawat (1997) reported the test of extract from galanga by TLC-bioassay with the fungi (*Cladosporium cladosporioides*), purified the active part by preparative chromatography and identified the structural elucidation by GC-MS spectroscopy method to confirm as 1'-acetoxychavicol acetate. The study of Bhassabutra (1997) found that extracts could inhibit growth of *Collectotrichum gloeosporioides* (Penz.) Sacc. and the purified extract with ethylacetate by column chromatography technique showed the efficiency to control the anthracnose postharvest disease on the surface of mango's fruit and confirmed the same result as Benzimidazole fungicide. Moreover, 1'-acetoxychavicol acetate could reduce the pain of stomach in the human (Jariyanusorn, 2002). Tanaka *et al.* (1997) found that 1'-acetoxychavicol

acetate from galanga could inhibit azoxymethane-stimulated tumor development and the mucosa cell expansion in the intestine of mouse by enhancing the activities of glutathione S-transferase (GST) and quinone reductase (QR) in the liver and intestine. GST was found in the mammal that can destroy toxin and cancer. So, any substance which can stimulate the activities of GST is very useful for cancer's resistance. Itokawa *et al.* (1987) also revealed that 1'-acetoxychavicol acetate and 1'-acetoxyeugenol acetate from galanga had power to resist cancer Sarcoma 180 ascites in mouse. Moreover, *Alpinia galangal* is used as antifatulent and carminative (Medicinal Plants in SiriRuckhachati Garden, 1991; Wanajak, 1999). Preliminary studies indicated that extracts of greater galangal exert antimutagenicity toward known mutagens-induced mutation in the Salmonella mutation assay (Viniketkumnue *et al.*, 1992; Rearungchom, 1993). Consequently, galanga is a high potential plant that has a lot of benefit in the future.

Giant galanga in Thailand consists of many local varieties showing wide variations in morphological and physiological characters. Classification of galanga varieties using only morphological character of plant could not identify the differences of galanga due to its close relationships. Phenotypes of galanga that expressed with shape, color or size may also get the influence from environment (Sakdren *et al.*, 1994) thereby confusing the classification based only on morphology.

At present, among several molecular approaches employed to assess genetic diversity and phylogenetic relationship in plant species, RAPD (randomly amplified polymorphic DNAs) analysis is the most simple and least labor method. In addition, RAPD analysis enables detection of informative genetic markers at a large number of loci in both coding and non-coding regions of the genome. The information on genetic diversity and relationships within and among crop species and their wild relatives is essential for the efficient utilization of plant genetic resource collections. Also, in this time, the evaluation of galanga genetic diversity and relationships are still insufficiently studied. Therefore, this study is concerned to evaluate the genetic diversity and relationships of giant galanga varieties collected in Thailand by RAPD analysis for selection of giant galanga cultivars which produce anti-fungal agent. The basic information will be useful for plant improvement in the future.