

## Chapter 1

### Introduction

Krachai-Dam (*Kaempferia parviflora* Wall. ex Baker) is an herbaceous plant belonging to the Zingiberaceae family. Its rhizomes have been traditionally used as a vitalizing and stimulating agent in Thai traditional medicine (also commonly known as 'Thai ginseng') since ancient times; it is especially used for the treatment of colic disorders (Jaipetch *et al.*, 1983) and increasingly for erectile dysfunction in men (Sennil and Thichalee, 2002). Consumers would purchase the black-internal Krachai-Dam rhizomes because their attitudes were that the darkness of internal skin color was positively correlated with the vitalizing and stimulating agents' contents in the rhizomes. The taste, marketing image/fame, products, quality, vitalizing ability and stimulating properties which resemble Korean ginseng were the most important factors related to consumers' purchasing decision of Krachai-Dam products. The most popular products were Krachai-Dam wine, Krachai-Dam honey wine and Krachai-Dam dry gin (Pojanagaroon and Kaewrak, 2003a).

Epidemiological studies conducted during the last 20 years have shown that coronary heart diseases are less prevalent in countries consuming a regular and moderate consumption of wine. In one of the best-known studies, Renaud and De Lorgeril (1992) suggested an explanation of the phenomenon particularly favorable to the French population with regard to cardiovascular disease, known as the "French paradox." This paradox confirms that mortality levels provoked by coronary artery disease are much lower in France than in other industrialized countries, even though the consumption of fats in France is similar and blood cholesterol levels are generally higher. Furthermore, other factors associated with the risk of coronary artery disease, such as arterial blood pressure, body weight and smoking, are no lower in France than in other countries.

Wine, particularly red wine, is an important source of polyphenols which are capable of inhibiting the processes behind coronary artery disease. This hypothesis is supported by the results of recent epidemiological studies concerning foodstuff polyphenols, particularly flavonoids, which was advanced that potent antioxidative phenolics in wine can prevent oxidation of LDL and explain the 'French paradox'. A correlation was also noticed between increasing levels of flavonoids ingestion from fruits and vegetables and a reduction in coronary artery disease. The studies carried out by Hertog *et al.* (1993), Knekt *et al.* (1996), Rimm *et al.* (1996) and Teissedre and Landrault (2000) revealed the benefits of a diet rich in flavonoids.

Crude dichloromethane, ethanol and methanol extracts of Krachai-Dam have shown antilipid peroxidation activity by using the TBA method (Yenjai *et al.*, 2002; Pojanagaroon and Rujjanawate, 2005). Thus, the hypothesis of this research is that Krachai-Dam honey wine should have potent antioxidant activity according to their raw materials.

As the main criteria for the selection of the rhizomes for growing in the next season of the farmers was the dark purple to dark internal skin color of the rhizomes, and they used this internal skin color to determine the price and to grade the rhizome

(Pojanagaroon and Kaewrak, 2003b). According to the botanical, chemical, pharmaceutical, genetically and agricultural aspects, Krachai-Dam can be divided into two main groups of cultivar: green leaves (pale internal color of rhizomes) and red leaves (dark internal color of rhizomes) groups. To solve the critical problems of Krachai-Dam wine regarding sensory aspects, which were being too bitter, and having a strong odor, thus the main product studied is Krachai-Dam honey wine, which uses honey instead of sugar as raw material in the fermentation process for upgrading wine quality. Not only comparing Krachai-Dam cultivars, but also studying several factors influence upon Krachai-Dam honey wine qualities such as yeast strains, proportion of rhizomes in must and honey types. The other factors studied comprise of plantation area, planting months, harvesting months, numbers of year crops, methods, and periods for Krachai-Dam storage.

### **Objectives of this research**

The main objectives of this research are as follows:

1. To standardise the quality of Krachai-Dam rhizomes for Krachai-Dam honey production.
2. To study the effects of plantation area, planting months, harvesting months, numbers of year crops, methods and periods for Krachai-Dam storage which using as raw materials for Krachai-Dam honey wine processing.
3. To find out the optimal Krachai-Dam honey wine processing that can be used for promoting and extending to the farmers.
4. To draft the good agricultural practices (GAP) of Krachai-Dam for Krachai-Dam honey wine processing purpose.

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่

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