Chapter 6

Conclusion

This experiment was conducted in order to standardise the qualities of Krachai-Dam (*Kaempferia parviflora* Wall. ex Baker) rhizomes for Krachai-Dam honey wine production. It had been carried out into 3 phases as followed;

Firstly, the study was made to find out the optimal method for producing honey wine that provides high total phenolic compounds (TP) and antioxidant index (AOI) in wine together with high appreciation scores from sensory evaluation. The condition of study was made under the effects of different Krachai-Dam cultivars, proportions of rhizomes in must, types of honey and dry commercial active powder yeast strains in fermentation process on qualities of wines were studied;

Secondly, after the best treatment from the previous experiment was obtained, the Krachai-Dam cultivar raw materials from the best previous treatment were used to study the optimal method to produce the second wine generation, under the condition of studying the effects of plantation areas, planting months, harvesting months, storage methods and periods on wine qualities;

Finally, the study was made on the quantitative and qualitative yields of raw materials that were used to produce the second wine generation, in order to standardise raw materials, and to draft Good Agricultural Practices (GAP) of Krachai-Dam growing for honey wine production.

This research was made from April 2004 to March 2007 at the Queen Sirikit Sericulture Centre (Chiang Mai) and the Department of Science and Technology, Faculty of Agro-industry, Chiang Mai University, Chiang Mai.

The results revealed as follows:

1. It was found that the optimal method, which showed the highest TP (342 mg GAE/100 ml) and AOI (3.42) with the highest appreciation scores from sensory testing, was Treatment 163. It was produced from 'Rom-Klao' cultivar (dark-purple internal color) with proportion of rhizomes in must of 12.5% w/w, Longan honey, and Lalvin V1116 (dry active powder yeast strain) in fermentation process. Actually, there was another treatment which showed the similar appreciation scores as Treatment 163. But due to showing lower TP and AOI, so that, treatment 163 was selected. Moreover, the Krachai-Dam honey wine from Treatment 163 rendered a higher TP and AOI when compared with the red wines from grapes. This optimal method was used to study the storage methods, periods and the environmental effects on wine qualities.

2. Base on the raw materials from Treatment 163 (Rom- Klao' cultivar), second phase of experiment was conducted. The effects of environmental factors on wine qualities indicate that the wine in Treatment 2-28 (in phase 2), which was produced from the rhizomes that were grown at the 'Maechonluang' area (1,350 m asl) in May, being harvested in February, and the 1-year crop showed the highest TP (380 mg GAE/100ml), AOI (1.36) and appreciation scores from sensory testing. Moreover, the cold storage at 13°C, 65% RH within 6 months after being harvested could preserve the TP and AOI in rhizomes and wines.

3. Base on the raw materials from Treatment 163 (Rom- Klao' cultivar), phase 3 experiment was conducted. The effects of these factors on quantitative and qualitative yields of raw materials were shown as follows: As for the quantitative yields, the 'Maechonluang' area supplied the significantly highest average yields/hectare (3,977.63 kg) and the average weight of rhizomes (38.52g). This resulted from longer rainy season, especially in October and November, higher organic matters (4.18%), nitrogen (0.210%) and potassium mineral contents (294.00 ppm) in soils, lower soil pH (4.8), and lower maximum/ minimum temperature (25-30/ 9-20°C) than other plantation areas. In addition, the sandy clay loam and sandy clay soil types were found in the 'Maechonluang' area. It was also found that the 2-year crop showed higher yields (4,740.75 kg/hectare) and weight of rhizomes (44.23 g) than the 1-year crop (3,214.82 kg and 21.39 g respectively). The qualitative yields containing internal color, TP and AOI of raw materials were compared with their honey wine qualities. The obvious relationship between the wines and their raw materials was established. There was a good correlation among TP, AOI and L* values of the two Krachai-Dam honey wine generations and their raw materials.

4. The linear and multiple regression equations for TP and AOI estimation were, therefore, proposed.

5. The research revealed the standardizing the Krachai-Dam rhizomes and drafting the GAP of Krachai-Dam growing for honey wine production. The cultivar that had a higher level of internal rhizomes' color gave a higher level of TP and AOI in Krachai-Dam honey wines, 'Phurua-10 (Rom-Klao).' The optimal area was an area with a higher elevation than 950 m asl. May and June were the optimal planting months while January and February were the optimal harvesting months. The instant processing after being harvested or storing in a cold storage for 6 months was also suggested.

Furthermore, this research also revealed the new standard formula for producing honey wine, which could be of great benefits for farmers and wine producers.