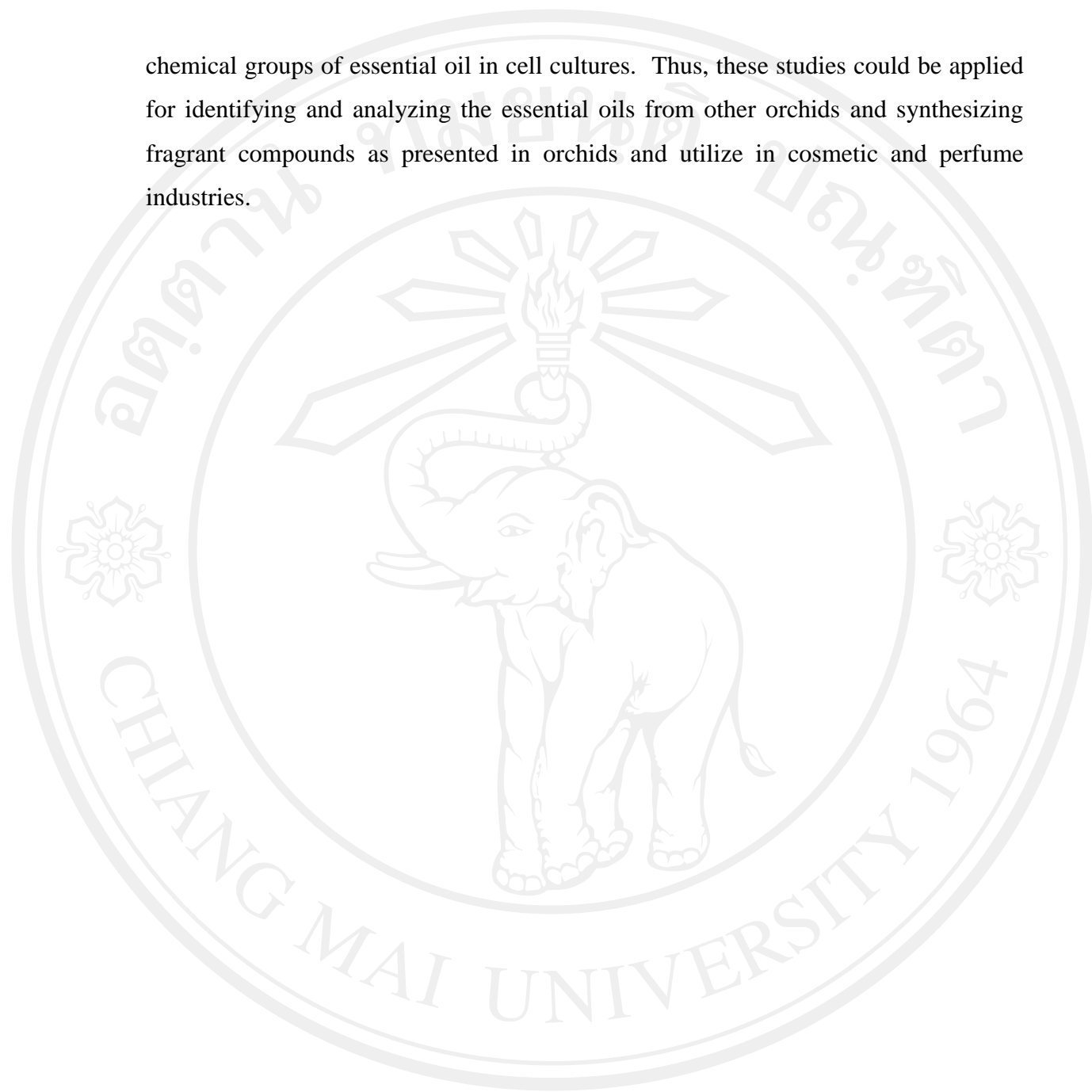


CHAPTER VI

CONCLUSION

The research work was aimed to identify and enhance the chemical constituents of essential oils from four fragrant orchids belong to *R. gigantea*, *R. gigantea* var. *harrisonianum*, *V. coerulea* and *D. parishii*. Plant parts (flowers, leaves, roots and/or pseudobulb) and their plant cell cultures were treated with some appropriate biotechnology methods included feeding precursor, elicitation, permeabilization and two-phase system. The chemical constituents of essential oils were characterized by Gas Chromatography-Mass Spectrometry together with Head Space-Solid Phase Microextraction technique. The volatile compounds were identified by using WILEY library program and calculated *n*-alkane standard. Results of study showed evidently that chemical constituents of essential oils were presented not only in the flowers but also in leaves, roots and pseudobulbs. Comparing the important constituents of chemical compound of these four studied plants, it was found that there were different compounds existed among these plants. Some secondary metabolites produced by *D. parishii* cell cultures could be enhanced and identified obviously with biotechnology methods. Elicitation was more advantage method in improving chemical constituents of essential oils than other methods, the analyzed chemical groups were similar to the suspension culture and the main chemical groups were sesquiterpene, aldehydes and ketones. The suggestion for further studies firstly should be emphasized on the combination use of the methods such as elicitation together with two-phase system or elicitation together with biotransformation. Secondly, adding new types of chemical use such as the other elicitors i.e. chitin, jasmonate. Thirdly, using of new biotechnology methods such as immobilized of cells. The benefits obtained from this study were identification of essential oils from four fragrant orchids and improving of essential oil production in plant cell cultures. The previous studies on biotechnologies in plant cell cultures were used for enhancing only the main components (one or two compounds) but in our works were able to both improve and increase all of the

chemical groups of essential oil in cell cultures. Thus, these studies could be applied for identifying and analyzing the essential oils from other orchids and synthesizing fragrant compounds as presented in orchids and utilize in cosmetic and perfume industries.



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