

## Chapter 1

### Introduction

Thailand is an important origin of tropical orchids, being rich in biodiversity of both botanical and horticultural interests, and has become a major center for orchid cultivation and research during the past 40 years. Recently, about 1,125 species in 177 genera have been found and identified. Among these more than 300 species in 80 genera are terrestrial orchids (Nanakorn and Indhamusika, 2000). The terrestrial orchids in Thailand comprise both evergreen and deciduous growth habits. They have wide arrays of morphological diversity in the forms of plant, leaf and flower.

For the past several decades, a large number of orchid hybrids especially *Dendrobium* hybrids, *Vanda* including its intra- and inter-generic hybrids, and also some terrestrial orchids, e.g. *Cymbidium*, *Paphiopedilum* and *Spathoglottis* have been successfully bred, registered and released to orchid communities. Nowadays, orchid growers and breeders try to introduce new orchid hybrids with new characteristics to serve both orchid industry and amateur demands. Many kinds of terrestrial orchids, especially in the deciduous group have new interesting characteristics that can be used in breeding programs, e.g. *Habenaria*, *Brachycorythis* and *Pecteilis*, to produce new cut flowers and/or potted plants for both hobby and commercial growing.

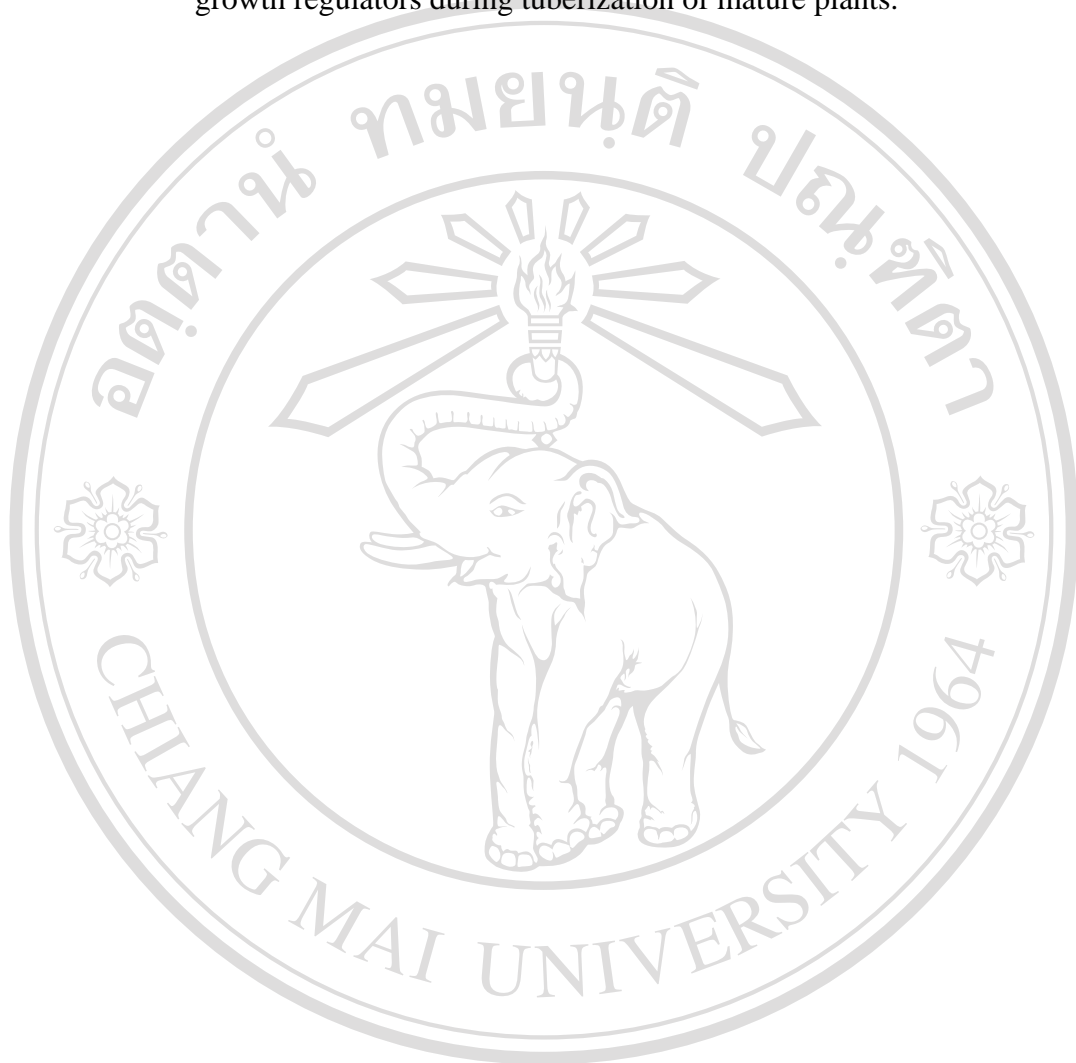
*Pecteilis sagarikii* Seidenfaden is an endemic terrestrial orchid of Thailand. It was named in the honour of Professor Dr. Rapee Sagarik. It is a deciduous ground orchid. It has been found and reported that *Pecteilis sagarikii* has two forms which are different in the lip color, viz. yellow lip and white with yellow at lip base (Thaithong, 2000). Because of its beauty, and compact, unique characteristics, suitable for growing as small potted plant, this caused high demand for this plant. Overexploitation results in decreasing its natural population and might be extinct.

Nowadays, the studies on the tropical terrestrial orchids, especially in the deciduous group have not been carried out extensively. This dissertation was attempted to study on the tuber formation of *Pecteilis sagarikii*, both *in vitro* and in a green house condition. It is hoped that the information gained from these studies will provide better understanding in the tuber formation processes, factors influencing their tuberization, and the tuber internal changes. In addition, the results from these studies will be beneficial for controlling seedling growth and tuber formation to produce numerous tubers for future use.

### Objectives of the experiments

1. To carry out studies on factors influencing growth and *in vitro* tuberization of *Pecteilis sagarikii* Seidenfaden.

2. To study histologically on tuberization from a germinating protocorm and a mature plant.
3. To study on the changing of macro elements, free amino acids and some growth regulators during tuberization of mature plants.



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