# CHAPTER 1

# INTRODUCTION

Orchids are angiosperm plants that show the greatest evolution (Hsiao *et al*., 2013). There are about 25,000 species of orchids that have been identified. In addition, there are more than 100,000 hybrids. They are many varieties and characteristics of flower shape, colors and fragrance. In Thailand, orchids are the most important flower crop. *Dendrobium* is the most important cut flowers in Thailand, others are *Cattleya, Phalaenopsis, Oncidium, Paphiopedilum, Vanda* and etc. Thailand can export orchid flowers to other counties i.e. Japan (31.9%), USA (21.0%), EU (15.8%), China (7.6%), Asians (3.0%) and the others market (20.7%) (Patipatpunya, 2011). The exporters have created orchid products i.e. pot plants, cut flowers, bouquet and others.

One of the most common found orchids in Thailand is a terrestrial orchid. This type of orchid is like a bulbous plant. It has a cycle of growing period and dormancy. Generally, terrestrial orchid can grow during rainy season and go to dormant during dry and cool season. There are quite a number of orchid species that have varieties in flower shape and color. *Habenaria* and *Pecteilis* are the two genera which have good characteristics and potential to develop for commercial use. One of the attractive *Habenaria* is *H. rhodocheila*. It has bright color and attractive flower shape. People like to grow it as a small pot plants but they can see it only a limited season because of dormancy period. The long dormancy is the reason why this species is not very popular. Breeders attempt to create new characteristics through intraspecific hybridization, as well as, intergeneric hybridization with others genus, for example, *Pecteilis*, which will make new a type of hybrids and it would be more graceful than wild species. Progress of breeding will enhance use of *Habenaria* in the future.

*Habenaria* and *Pecteilis* are terrestrial orchids, that are not widely studied on orchid morphology (Limpiyaprapan, 2011). At first, *Pecteilis* was in *Habenaria* genus, and then it was separated to theirs own genus. The characteristics of *Pecteilis* species has short spur, both side of staminal column and mentum are short. Flowers of *Pecteilis* are white (Thaithong, 2005). Moreover, they are different in some characteristics, such

as lip color and petal color. Nowadays, molecular marker method can elucidate relationship of plants which, sometimes, are different in terms of morphology but molecular marker can show similarity between and within genera. There are several molecular markers which can be employed. One of the popular methods is Random Amplified Polymorphic DNA (RAPD). This method is simple and can be used to find genetic relationship among orchids such as *Dendrobium* (Inthawong, 2004), *Doritis* (Duangkhet, 2013), *Paphiopedilum* (Chung *et al*., 2006), *Phalaenopsis* (Taywiya, 2010) and *Vanda* (Manners *et al.*, 2013). Since, the relationship between *Habenaria* and *Pecteilis* genera is not so clear, molecular marker techniques might be able to elucidate the similarity and/or difference of these two genera. In this study, RAPD was employed to analyze genetic relationship of *Habenaria* and *Pecteilis*.