

CHAPTER I

INTRODUCTION



Apis florea, dwarf honeybee, is a small honeybee with a small single colony and lives in an open nesting habitat. *A. florea* is generally distributed in warm climate. It is native to Thailand and presently lives throughout the country. Character of *A. florea* was less aggressive than other species so it can adapt to live any places. Honeybee is a highly eusocial insect that divides duty into three castes, queen, drone, and worker. A worker performs almost tasks in a colony such as making comb, tending larvae, tending queen, tending young drones, gathering food, defending hive, etc. Moreover, it is very important to plantation when a worker gathers food, nectar and pollen. It helps plants to continue natural pollination. Furthermore, it is economic to produce useful products such as honey, beeswax, venom, propolis, pollen, and royal jelly. Honey is a main product of honeybee. The essential use of honey is as a flavoring sweetener and energy source. In addition, honey can be used in medicine and cosmetics. Honey also performs healing properties such as antimicrobial activity, moisturizing removal, and oxygen barrier property (Schmidt, 1996). Honey is mainly produced by the activity of alpha – glucosidase, AG. The AG is an enzyme that hydrolyzes 1, 4 – glycosidic linkage in sucrose, disaccharide, to be fructose and glucose, monosaccharide. Therefore, honey is composed of monosaccharides which are easily absorbed and help in transferring energy to consumers. AG is synthesized in hypopharyngeal glands (HPGs). The AG production is very high in mature honeybee, forager bee. The high production of AG coincides to the duty of forager bee which seeks nectar and converts it to be honey. The AG in other honeybee species, *A. mellifera* and *A. cerana*, was mostly studied in foreign countries but not in *A. florea* yet.

The objective of this research is to study an expression level of AG in *A. florea* from different stages. We attempt to obtain a cDNA sequence of AG in *A. florea* and to construct a phylogenetic tree of the gene among other organisms. Moreover, AG will be partially purified by chromatography and enzyme activity will

be assayed. Then, we expect to know the MW of AG in *A. florea*. In addition, optimum conditions of partially purified AG will be verified. The outcomes and benefits from this research, especially in some kinetics and properties of AG, will be useful to apply to a sweetened industry. Finally, it will bring to a promotion in honeybee industry because *A. florea* is a native species in Thailand.