# Chapter I

# Introduction

Over the past decade, there has been wide spread interest in the study of free radical mediated disease and possible antioxidant therapies. Recently, antioxidants have attracted a great attention for diseases such as aging, age-related disease and cancer due to their role in preventing oxidative stress for health. Furthermore, antioxidants are of interest because of interaction of additives with the food matrix and maintenance of shelf life, quaility, and attractiveness of the food (1). For human life, oxidative stress arises from both endogenous and exogenous sources; inflamation and air pollutant, which lead to cell death and many diseases. Many substances and enzymes are proposed to act as antioxidants such as glutathione, catalase, superoxide dismutase and glucose oxidase. Oxidative damage of DNA can be demonstrated which indicates that only endogenous antioxidant defense systems are not able to scavenge reactive oxygen species (ROS) completely and that repair processes are not effectively. Hence, dietary antioxidant may be particularly important in protective against DNA damage. Epidemiological studies have revealed that a high consumption of fruits and vegetables in consistantly associated with a low incidence of common human cancers. Many substances found in fruits and vegetables have been proposed to act as antioxidants such as β-carotene, tocopherol, ascorbic acid and other phenolic compounds. There is an increasing interest in the level of antioxidant in food from several area of research, especially from edible plants which are candidates for preventing cancer and for extending the life span of animals (2).

In Thailand, over 13,200 of plant species are reported and some species are found only in Thailand. Thai indiginous vegetables are hidden treasure to learn about local consuming culture which are the regional characterization. They play the role in nutritional, ecological, medicinal, and related to lifespan, religion, and culture. Now, the benefits from plant diversity are lessly reported, and some species are lost on the world. Therefore, studies on the using of plant diversity such as indiginous vegetables which have antioxidant contain are needed to promote, conserve, and apply for further use.

Several methods have been developed to measured the total antioxidant activity. In this study, some edible Thai indiginous vegetables are collected and determined for the total antioxidant capacity. The techniques used are based on the inhibition of the accumulation of the 2, 2' -azino-bis(3-ethyl benthiazoline-6-sulfonic acid) (ABTS) radical which is generated by the peroxidase activity of metmyoglobin and hydrogen peroxide. Trolox (6-hydroxy-2, 5, 7, 8 -tetramethylchroman-2-carboxylic acid), one of the antioxidant is used as standard. The unit of activity is TEAC (Trolox Equivalent Antioxidant Capacity), which is defined as the antioxidant capacity of 1.0 mg of samples to 1.0 mg of Trolox.

The objectives of the study are :-

1. to optimize the concentration of metmyoglobin and hydrogen peroxide for measuring total antioxidant capacity of Trolox standard solution.
2. to determine total antioxidant capacity of 62 edible Thai indiginous vegetables.
3. to study the inhibition of ABTS radical accumulation in some edible Thai indiginous vegetables.