

CHAPTER 1

INTRODUCTION

Since many degenerative diseases have been recognized as being a consequence of free radical damage¹, there have been many studies undertaken on how to delay or prevent the onset of these diseases. The most likely and practical way to fight against degenerative disease is to improve body antioxidant status which could be achieved by higher consumption of vegetables and fruits. Flavonoids and other plant phenolics are reported, in addition to their free radical scavenging activity², to have multiple biological activities. They inhibit LDL oxidation *in vitro*³. Thus, polyphenols probably protect LDL oxidation *in vivo* with significant consequences in atherosclerosis. And also protect DNA from oxidative damage with important consequences in the age-related development of some cancers⁴. In addition, flavonoids have antithrombotic and anti-inflammatory effects⁵. The antimicrobial property of polyphenolic compounds has been well documented⁶. Several types of polyphenols (phenolic acids, hydrolysable tannins, and flavonoids) show anticarcinogenic and antimutagenic effects. Polyphenols might interfere in several of the steps that lead to the development of malignant tumors, inactivating carcinogens, inhibiting the expression of mutant genes and the activity of enzymes involved in the activation of procarcinogens and activating enzymatic systems involved in the detoxification of xenobiotics⁷. Several studies have shown that in addition to their antioxidant protective effect on DNA and gene expression, polyphenols, particularly

flavonoids, inhibit the initiation, promotion and progression of tumors, possibly by a different mechanism. The possible link between antioxidants and health is a very popular issue of discussion among people with varying levels of nutritional knowledge. However, much information in the public domain may mislead people to assume that antioxidants are something magical that could protect them from many kinds of disease. Presently, the most widely used antioxidants are the synthetic ones like BHT, BHA, and TBHQ. However, consumers are bothered about the safety of artificial food additives and this has promoted and increased the search for natural antioxidants to replace the synthetic ones. Natural antioxidants like tocopherols, ascorbic acid are very expensive and their colour and flavour characteristics have limited their use as food additives. Therefore, attention in recent times has been focused on the isolation, characterization and utilization of natural antioxidants especially of Thai indigenous plants.

The aims of the present work were to determine the antioxidant activities and cytotoxicities of the indigenous plant extracts and study the chemical characterization of phenolic compounds with high antioxidant activity of the selected plant.