

CHAPTER 1

INTRODUCTION

Non-communicable diseases (NCDs) such as obesity, diabetes, hypertension and Alzheimer's disease (AD) have been both national and international health problems for a long time, especially in developing countries. The incidence of these diseases had been proved to be in high correlation with various internal and external factors with oxidative stress being the significant linkage of all diseases. Thus, phenolics and antioxidants, both natural and synthetic compounds, are potential choices for prevention and treatment of these NCDs. Besides, the inhibition of key enzymes that control these particular diseases is currently of public interest and is a platform of drug design for medicinal treatment. Several synthesized drugs have been proposed as potential medicinal treatment of these diseases. Some have even been approved for applying to the patients despite their adverse effects, which eventually lead to the withdrawal of some drugs. Thus, the search of functional foods that can replace these drugs in term of preventing the diseases would be beneficial regarding confidence to consume, less/no side effect and economically effectiveness.

Legumes have been reported as functional food, which provides health benefits in term of being a good source of phenolics. Recently, the investigation in natural products that can act as nutraceuticals is of interesting for promoting health benefits. Plants are sources of diverse phytochemicals that have potential efficacy for preventing or treating several NCDs. Legumes are economically and nutritionally important food crops, which are cultivated and consumed in many countries throughout the world. In Thailand, different types of legumes including mung bean, black bean, red kidney bean, soybean, white kidney bean, and peanut are cultivated in every region. Legume seeds contain low-molecular-weight protein, low glycemic index, low cholesterol and are considered as rich sources of macronutrients and micronutrients. Moreover, legumes are good sources of bioactive compounds such as phenolic acids, anthocyanins, flavonoids, saponins, lecithins and tannins, all of which

are mainly resided in seed coats. Some of these compounds can function as antioxidants against oxidative stress and might as well inactive some key enzymes relevant to obesity, diabetes, hypertension and AD. Nevertheless, the information regarding control of these diseases through key enzymes' inhibition as well as the effect of legume parts and cooking process of legumes is limited. Thus, the investigation of the health benefits on these legumes is an interesting and necessary approach that can eventually lead to supportive evidence to promote the usage of legumes as excellent choices of healthy food. As well, this information can provide new dietary sources of bioactive compounds for further development of nutraceuticals for prevention and treatment of oxidative stress, obesity, diabetes, hypertension and AD.