CHAPTER I

INTRODUCTION

The Northern Thai community has a long history of extracting medicinal plants for local consumption and for the disease treatments. Northern Thai medicinal plants have been used since time immemorial to treat various disorders and offer an alternative to the synthetic compounds, as they have been considered either non-toxic or less toxic. Several medicinal plants in Northern Thailand have been used in rheumatoid arthritis, hemorrhoid, and muscle arthritis by traditional practitioners for a long time without the scientific support data. Therefore, it is worthy to study the anti-inflammatory property of those plants.

Antioxidants are substances that can destroy or block free radicals occurring from herbicides, oxidants, and other toxic compounds. Several oxidants such as reactive oxygen species (hydrogenperoxide, superoxide anion radical, etc) and reactive nitrogen species (nitric oxide, peroxynitrite, etc) are implicated in mediating a wide array of human disease including atheroscerosis, cancer, diabetes, Parkinson's and neurodegenerative diseases. Oxidants contribute to disease processes by causing damage to biomolecules and altering cellular metabolism. Some oxidants can induce cyclooxygenase, cause pain, destroy certain protease inhibitors, and enhance production of IL-1 and TNF. Activation of cGMP may also account for some of the anti-inflammatory effects of NO.

Recently, antioxidants are very well known among health professionals, because antioxidants have been used in health promotion, and in the prevention of several diseases. In Thailand, several Northern Thai medicinal plants provide antioxidants and their bioactive effects. The antioxidant activity of the plant extracts cannot be evaluated by only a single method due to the complex nature of phytochemicals, a single method due to the complex nature of phytochemicals, so it is important to employ commonly accepted assays to evaluate the antioxidant activity of plant extracts. Antioxidative capacity and anti-inflammatory properties of this ethanolic extracts were evaluated

by ABTS free radical decolorization assay, superoxide anion scavenging activity, nitric oxide scavenging activity, peroxynitrite scavenging activity, cyclooxygenase-2 (COX-2) inhibition and prevention DNA damage induced by free radical.

The objectives of this study are as follows:

1. To study the relationship between free radical scavenging activity and anti-inflammatory effect of six medicinal plants in Northern Thailand extract.
2. To measurement antioxidant activity by $ABTS^{\bullet+}$, superoxide anion, nitric oxide, peroxynitrite scavenging activity, and protection of plasmid DNA damage protection-induced by Fenton reaction.
3. To determine cyclooxygenase-2 inhibition of medicinal plant in Northern Thailand extracts which are chosen for at least three extracts with high activity from 2.