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XANTHINE OXIDASE INHIBITORY EFFECT OF *MYRMECODIA PLATYTYREA* TUBER EXTRACTS

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TABLE OF CONTENTS

ABSTRACT

Many chronic diseases such as cancer, diabetes, atherosclerosis, Alzheimer's and Parkinson disease are oxidative stress-related. Oxidative stress is an imbalance of production of free radicals and its defense mechanisms, favouring the former. Oxidative stress causes tissue injuries and leads to the development of many disorders. An antioxidant is an agent that can prevent oxidative stress. It can stop, prevent or delay the oxidisable material oxidation by oxidative stress reduction and scavenging of free radicals. Phytocontituents in many medicinal plants are actually useful for scavenging the free radicals. *Myrmecodia platytyrea* subp. Antoinii (Becc.) Huxley & Jebb is an epiphytic plant found in the tropical forest of the Southeast Asia and large islands extending south to Queensland in Australia. *Myrmecodia* spp. has been used traditionally in the Southern Asia, for diarrhea, peptic ulcer, swelling, tuberculosis, headaches and hemorrhoids treatments as a decoction. It also can be used to manage cancer, coronary heart disease and hyperuricaemia. Therefore, the aim of this study was to determine the xanthine oxidase inhibitory effect of various extracts of *Myrmecodia platytyrea* tuber to inhibit excess production of uric acid which is associated with gout. The xanthine oxidase inhibitory (XOI) activity of crude methanol extract, as well as hexane, ethyl acetate and aqueous of *Myrmecodia platytyrea* tuber were investigated. It was found that methanol extract had the highest percentage of inhibition compared to other extracts with 102.35±5.55 % at the concentration of 100 µg/mL. Furthermore, all extracts were comparable to allopurinol (103.44 ± 5.55 % inhibition at 100 µg/mL), which is the standard reference used in this assay. In conclusion, extracts of *Myrmecodia platytyrea* tuber have potent XOI activity comparable to allopurinol. This may warrant more attention for natural sources to be recognised as a remedy for gout.

CHAPTER 1

INTRODUCTION

1.1 Background

Free radicals are atoms or molecules that contain one or more unpaired electron (Valko et al., 2006). They are cytotoxic thus can cause tissue injuries (Jainu and Shymala Devi, 2005). The reactive oxygen species and reactive nitrogen species formation can trigger oxidation in vivo and in vitro cause oxidative stress, which can lead to many diseases and also disorders (Rackova et al., 2007). They also can cause oxidative deterioration of products from foods, also in the pathogenesis of the disease among human, for example, chronic inflammation, diabetes mellitus, atherosclerosis, neurodegenerative disorder and several types of tumor or cancer (Valko et al., 2007; Frankel, 1996; Frankel & German, 2006).

An antioxidant is an agent that can fight against oxidation. It can stop, prevent or delay the oxidisable material oxidation by oxidative stress reduction and scavenging of free radicals (Dai & Mumper, 2010). One molecule of antioxidant can react with a single molecule of free radical at one time. It is able to neutralize the free radical by electron donating, reaction of ending carbon stealing (Sen et al., 2010).

Nowadays, herbal or natural product from medicinal plants are explored as the new interest for the treatment of chronic diseases. Approximately 80% of the world population utilize plant sources as their alternative medicine to treat and manage their condition. Usage of the naturally occurring antioxidants for prophylaxis treatment of many diseases that is related to oxidative