

**UNIVERSITI TEKNOLOGI MARA**

**IN-VITRO ANTI-INFLAMMATORY ACTIVITY OF  
STANDARDIZED AQUEOUS EXTRACT OF *ERYTHROXYLUM  
CUNEATUM* IN LIPOPOLYSACCHARIDE-INDUCED RAW 264.7  
CELLS**

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## ABSTRACT

*Erythroxylum cuneatum* has long been used by the folks as a traditional herbal medicine to treat inflammatory disease such as rheumatoid arthritis by chewing the dried leaves. This plant was chosen because only few studies were conducted on *Erythroxylum cuneatum*. The aim of the study is to determine the in-vitro anti-inflammatory activity of standardized aqueous extract of *Erythroxylum cuneatum* in lipopolysaccharide-induced RAW 264.7 cells. We evaluate the protective and toxicity effect of *Erythroxylum cuneatum* by measuring the percent cell death in MTT assay. The pro-inflammatory cytokines such as Tumor Necrosis Factor alpha (TNF- $\alpha$ ) and Interleukin-1 $\beta$  (IL-1 $\beta$ ) production were evaluated after the cells were induced by the lipopolysaccharide (LPS) of gram negative bacteria with presence of *Erythroxylum cuneatum*. The pro-inflammatory cytokines were evaluated by ELISA. In this research, upon stimulation of *Erythroxylum cuneatum* in lipopolysaccharide-induced RAW 264.7 cell showed that there are significantly reduced of the amount of pro-inflammatory cytokines production. These results suggest that *Erythroxylum cuneatum* may have anti-inflammatory activity by inhibiting TNF- $\alpha$  and IL-1 $\beta$  in RAW 264.7 cell.

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of study

*Erythroxylum cuneatum* is a plant of interest in this research. This plant is from the Erythroxylaceae family. The common names of this plant are *Chinta mula*, *inai-inai*, *kayu urang*, wild cocaine and *Gu Ko Yi* (Ody, 2000). Leaves from the Erythroxylaceae family such as *Erythroxylum coca* are used as an anti-inflammatory agent by the old folks. The leaves contain several alkaloid, the most important alkaloid are cocaine. The used of this leaves is as stimulant, carminative and also has a potent local anesthetic effect when applied to mucosal membranes (Jarald & Jarald, 2006). So, it is believed that *Erythroxylum cuneatum* will have the same indication for the treatment of inflammation.

The inflammatory response or inflammation is when tissues are damaged by inflammagen (Rainsford, 2004). Inflammagen is an irritant that elicits both edema and the cellular response of inflammation. Inflammagens can be bacteria, trauma, toxins, heat or any other cause. Inflammation produces five major symptoms that are redness, heat, swelling, pain and disturbance of function (Stoelting & Hillier, 2012).