

UNIVERSITI TEKNOLOGI MARA

**ANTI-NOCICEPTIVE ACTIVITY OF
STIGMASTEROL ON ACETIC ACID-INDUCED
INFLAMMATION ON MICE**

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ABSTRACT

Stigmasterol is a phytosterol found in many plants such as *Tridax procumbens* and *Tridax procumbens*. Based on previous studies, stigmasterol-containing plant extract exhibit hypoglycemic, antioxidant and anti-inflammatory activity, but few studies were carried out on is anti-inflammatory activity as a pure compound. This study investigates the antinociceptive activity of stigmasterol using acetic acid-induced writhing test as the inflammatory pain model. Oral administration of stigmasterol (10, 20, 40 mg/kg) showed antinociceptive ability in a dose-dependent manner. Using indomethacin (10 mg/kg) as standard drug reference, stigmasterol (40 mg/kg) showed significant pain inhibition at min-30, as compared to min-5 ($p=0.000$). Indomethacin (10 mg/kg) showed a similar pattern to stigmasterol (40 mg/kg) and has significant increase in analgesic effect at min-30, as compared to min-5 ($p=0.000$). Hence suggesting comparable potency between stigmasterol (40 mg/kg) and indomethacin (10 mg/kg). The ability to stigmasterol to inhibit pain may be due to its ability to inhibit of inflammatory mediators such histamine, serotonin, prostaglandin and bradykinin via arachidonic pathway. In conclusion, stigmasterol possesses potent antinociceptive ability comparable to indomethacin and further studies are warranted to determine its molecular mechanism.

CHAPTER 1: INTRODUCTION

Inflammation process can be interpreted as the body's attempt in fighting injuries. There are several inflammation signs, characterized as heat, loss of function, redness, swelling and pain (Serhan et al., 2010). Inflammation occurs as the body's response to infections and injuries. It attempts to remove the stimuli and the pathogens that causes pain. Several cases may happen where inflammation causes serious disease such as arthritis, which is the inflammation in the joints.

There are several major events in inflammation process. Vasodilation is the dilation of blood vessels, increasing the blood flow to the inflamed area causing rubor and calor. Elevated vascular permeability causes the endothelial cells to leak from direct cell injury or by chemical mediators. An increase in osmotic pressure and hydrostatic pressure causes exudation of fluid from the intravascular space. Lastly, chemical mediators and inflammatory cells are allowed to respond to the stimulus by slowing down the blood flow in the bloodstream.

Chronic inflammation also may contribute to many serious diseases such as cardiovascular disease, cancer and diabetes (Lucas et al., 2006). If the response during acute inflammation process is inadequate to remove the proinflammatory substances, it will lead to chronic inflammation, which comprises the rapid increase of neutrophils and fibroblast (Elango et al., 2012). Insufficiency in response to the inflammatory reaction will cause immunodeficiency, which is the foundation of infection and cancer. Even so, an excessive inflammatory response will end with morbidity and mortality in atherosclerosis, inflammatory bowel disease, multiple sclerosis, diabetes, Alzheimer's disease, rheumatoid arthritis, myocardial and cerebral ischaemia (Tracey, 2002).