

## ABSTRACT

**Awani, JMI., 2025, GASTROPROTECTIVE ACTIVITY OF ESSENTIAL OIL INHALATION FROM CURCUMA XANTHORRHIZA ROXB RHIZOME AND HISTOPATHOLOGICAL FEATURES OF THE STOMACH IN MALE MICE INDUCED WITH ACUTE STRESS, THESIS PROPOSAL, FACULTY OF PHARMACY, UNIVERSITY SETIA BUDI, SURAKARTA.**

Stress is the body's response to physical, emotional, or psychological pressure, one of the causes of stress is sound. The purpose of this study was to determine the value of TNF  $\alpha$ , gastroprotective activity, and analyze the histopathological image of the stomach of male mice that were given inhalation of essential oil of curcuma rhizome and induced by acute stress using the modified ultrasonic method.

The study was conducted experimentally using male mice divided into 6 groups, namely group 1 as a normal control that was not induced by anything. Group 2 was induced with stress using ultrasonic, group 3 positive control was given ranitidine 0.8 mg/20 grams of mouse body weight given orally ultrasonic-induced stress. Group 4 was induced with stress and given inhalation of temulawak rhizome essential oil with a concentration of 0.5%, Group 5, was induced with stress and given inhalation of temulawak rhizome essential oil with a concentration of 1% and Group 6, was induced with stress and given inhalation of temulawak rhizome essential oil with a concentration of 2%. Stress was induced using ultrasonic method, and the observed parameters included TNF- $\alpha$  levels, gastric fluid pH and histopathological features.

The results of the study demonstrated that inhalation of essential oil from *Curcuma xanthorrhiza* rhizome was able to reduce TNF- $\alpha$  levels in mice induced with acute stress, indicating anti-inflammatory activity. The treatment also exhibited a gastroprotective effect, as evidenced by a reduction in the number and severity of gastric ulcers and improvements in gastric mucosal structure. Histological observations revealed a decrease in tissue damage, such as necrosis, mucosal erosion, and infiltration of inflammatory cells, in the treatment groups compared to the negative control group. Therefore, inhalation of *Curcuma xanthorrhiza* essential oil has potential as an anti-inflammatory and gastroprotective agent under acute stress conditions, as indicated by the reduction of TNF- $\alpha$  levels and improvements in gastric histological structure.

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**Keywords:** Essential oil, *Curcuma xanthorrhiza*, acute stress, stomach, TNF- $\alpha$ .

