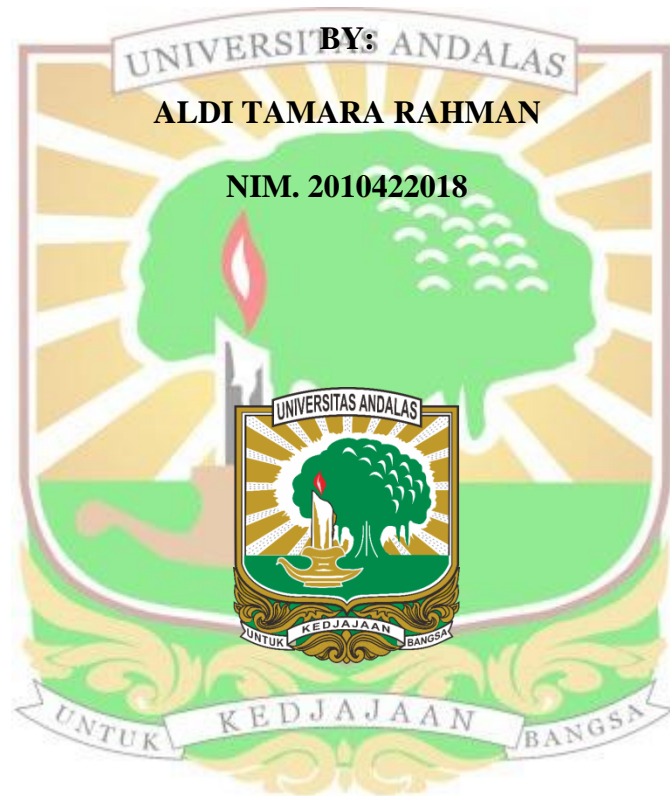


EFFECT OF ETHANOLIC EXTRACT OF SUMATRA WILD TURMERIC

(*Curcuma sumatrana*: Zingiberaceae) RHIZOME IN PREVENTING

ULCERATIVE COLITIS: IN VIVO AND IN SILICO STUDY

BIOLOGY UNDERGRADUATE THESIS



BIOLOGY DEPARTMENT

FACULTY OF MATHEMATICS AND NATURAL SCIENCES

UNIVERSITAS ANDALAS

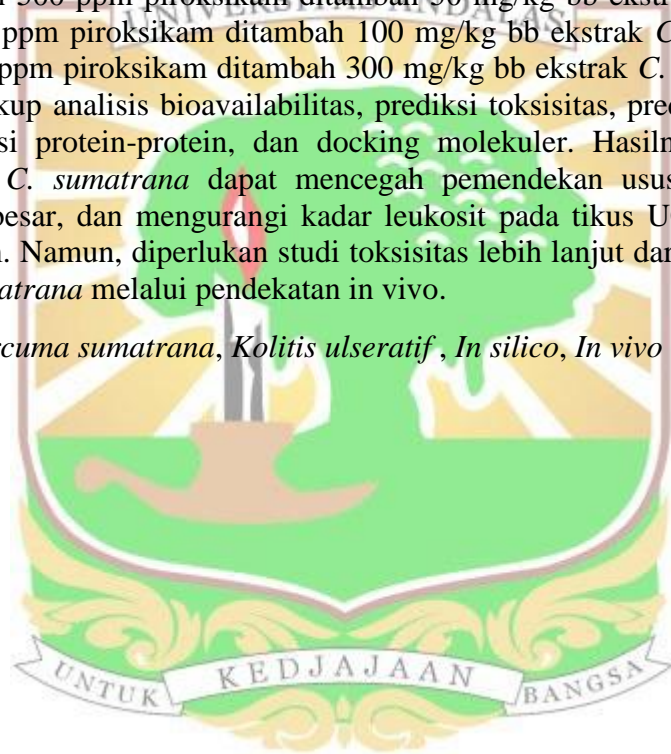
PADANG

2024

ABSTRAK

Kolitis ulseratif (UC) adalah penyakit radang usus besar yang prevalensinya semakin meningkat setiap tahun di Asia, termasuk Indonesia. Pengobatan yang ada saat ini sering kali memiliki efek samping yang signifikan, sehingga diperlukan terapi alternatif dengan efek samping yang lebih sedikit. *Curcuma sumatrana*, tanaman endemik Sumatra, dilaporkan memiliki sifat antiinflamasi dan antioksidan. Penelitian ini bertujuan untuk menyelidiki efek ekstrak etanolik *C. sumatrana* dalam mencegah kolitis ulseratif menggunakan pendekatan *in vivo* dan *in silico*. Tikus jantan dewasa ($n = 30$) secara acak dibagi menjadi enam kelompok selama 28 hari: P1 tanpa perlakuan (kelompok kontrol), P2 dengan 500 ppm piroksikam (induktor UC), P3 dengan 500 ppm piroksikam ditambah 100 mg/kg bb sulfasalazine (obat komersial UC), P4 dengan 500 ppm piroksikam ditambah 50 mg/kg bb ekstrak *C. sumatrana*, P5 dengan 500 ppm piroksikam ditambah 100 mg/kg bb ekstrak *C. sumatrana*, dan P6 dengan 500 ppm piroksikam ditambah 300 mg/kg bb ekstrak *C. sumatrana*. Studi *in silico* mencakup analisis bioavailabilitas, prediksi toksisitas, prediksi bioaktivitas, analisis interaksi protein-protein, dan docking molekuler. Hasilnya menunjukkan bahwa ekstrak *C. sumatrana* dapat mencegah pemendekan usus besar, menjaga histologi usus besar, dan mengurangi kadar leukosit pada tikus UC yang diinduksi oleh piroksikam. Namun, diperlukan studi toksisitas lebih lanjut dari ekstrak etanolik rimpang *C. sumatrana* melalui pendekatan *in vivo*.

Kata kunci: *Curcuma sumatrana*, Kolitis ulseratif, *In silico*, *In vivo*



ABSTRACT

Ulcerative colitis (UC) is an inflammatory disease of the colon with increasing prevalence annually in Asia, including Indonesia. Current treatments often have significant side effects, highlighting the urgent need for alternative therapies with fewer adverse effects. *Curcuma sumatrana*, an endemic plant of Sumatra, has been reported to possess anti-inflammatory and antioxidant properties. This study aims to investigate the effects of ethanolic extract of *C. sumatrana* in preventing ulcerative colitis using both *in vivo* and *in silico* approaches. Adult male mice (n = 30) were randomly assigned into six groups over 28 days: P1 with no treatment (control group), P2 with 500 ppm piroxicam (UC-inductor), P3 with 500 ppm piroxicam plus 100 mg/kg bw sulfasalazine (UC commercial drug), P4 with 500 ppm piroxicam plus 50 mg/kg bw *C. sumatrana* extract, P5 with 500 ppm piroxicam plus 100 mg/kg bw *C. sumatrana* extract, and P6 with 500 ppm piroxicam plus 300 mg/kg bw *C. sumatrana* extract. In silico studies included bioavailability analysis, toxicity prediction, bioactivity prediction, protein-protein interaction analysis, and molecular docking. The results showed that *C. sumatrana* extract could prevent colon shortening, maintain colon histology, and reduce leukocyte levels in piroxicam-induced UC mice. However, further toxicity studies of the ethanol extract of *C. sumatrana* rhizome through *in vivo* approaches are needed.

Keywords: *Curcuma sumatrana*, *In Silico*, *In Vivo*, *Ulcerative colitis*

