# INTISARI

Kolitis Ulseratif (KU) berdampak terhadap kualitas hidup penderitanya. Efek samping pengobatan KU menyebabkan penyakit kardiovaskular, nefrotoksisitas, dan penekanan sumsum tulang. *Morinda citrifolia* Linn memiliki beragam potensi diantaranya sebagai antiinflamasi, dan antioksidan. Tujuan penelitian adalah mengkaji efek Ekstrak Etanolik Buah Mengkudu (EBM) terhadap perbaikan inflamasi kolon dan populasi bakteri saluran pencernaan pada KU.

Mengkudu diekstraksi menggunakan etanol 70%. Ekstrak dikarakterisasi dengan analisis proksimat (kadar air, kadar abu, kadar serat), kandungan fitokimia dengan metode Kromatografi Cair Kinerja Tinggi dan aktivits antioksidan dengan metode DPPH, ABTS dan FRAP. Induksi KU pada mencit Balb/c jantan umur 12-14 minggu, menggunakan Asam Asetat (AA) 2%. Mencit dibagi menjadi kelompok normal, kelompok positif (Sulfasalazin 30mg/kgBB), kelompok negatif (induksi AA 2%), EBM (100-400mg/KgBB). Pengaruh EBM terhadap keparahan KU ditentukan berdasarkan Indeks Aktivitas Penyakit (IAP), pengamatan histopatologi (Pengecatan Hematoksilin-Eosin), pengukuran ekspresi *tnf-α*, dan *il-6* (metode qPCR), serta penentuan populasi bakteri (metode *Shotgun Metagenomic Squencing*).

EBM mengandung 392,28 ± 0,01 µg/g skopoletin. Nilai $IC_{50}$ pada pengujian DPPH yaitu 0,553 ± 0,001 µg/mL. Pada dosis 400mg/kgBB, EBM menunjukkan potensi dalam mengurangi skor IAP. Kondisi lesi kolon membaik pada kelompok EBM (100-400mg/KgBB) dan memiliki aktivitas yang sama dengan kelompok kontrol positif. Pemeriksaan histopatologi jaringan kolon mengungkapkan tingkat keparahan skor kerusakan EBM dosis 400mg/KgBB (3,0±0,244) berkurang dibanding kelompok kontrol negatif (10,8±0,475). Pemberian EBM menurunkan ekspresi *tnf-α*, dan *il-6.* Terdapat perbedaan ekspresi gen *il-6* antara kelompok EBM 400mg/KgBB (1.093 kali) dengan kelompok negatif (5,962 kali) ($p<0,05$). Terdapat juga perbedaan ekspresi gen *tnf-α* EBM 400mg/KgBB (1,000 kali) dengan kelompok negatif (12,290 kali) ($p<0,05$). Pada analisis sekuen filum bakteri terdapat peningkatan tinggi populasi *Actinomycetota, Ascomycota* dan *Bacteroidota* pada kelompok negatif, sedangkan *Campylobacterota* mengalami penurunan. Dalam taksonomi kelas, *Bacili, coriobacteria, erysipelotrichia, dan saccharomycetes* meningkat pada kelompok negatif. Sebagai kesimpulan, EBM berpotensi untuk dikembangkan sebagai sediaan yang dapat mengurangi keparahan pada kondisi KU.

Kata kunci : Kolitis Ulseratif, Ekstrak Etanolik Buah Mengkudu, *tnf-α*, *il-6*, *Firmicutes, Bacteriodetes.*

*ABSTRACT*

Ulcerative Colitis (UC) impacts the quality of life of sufferers. Side effects of UC treatment include cardiovascular disease, nephrotoxicity, and bone marrow suppression. Morinda citrifolia Linn. has various potentials, including anti-inflammatory and antioxidant. The aim of this study was to assess the effect of Morinda Fruit Ethanolic Extract (Morinda Fruit Ethanol Extract) on improving colonic inflammation and gastrointestinal bacterial populations in UC.

Morinda Fruit was extracted using 70% ethanol. The extract was characterized by proximate analysis (water content, ash content, fiber content), phytochemical content using High-Performance Liquid Chromatography (HPLC), and antioxidant activity using DPPH, ABTS, and FRAP methods. UC was induced in 12-14-week-old male Balb/c mice using 2% AA. Mice were divided into a normal group, a positive group (Sulfasalazine 30 mg/kgBW), a negative group (2% AA induction), and EBM (100-400 mg/kgBW). The effect of EBM on UC severity was determined based on the Disease Activity Index (DAI), histopathological observations (HE staining), measurement of TNF-α and IL-6 expression (qPCR method), and bacterial population determination (shotgun sequencing method).

EBM contains 392.28 ± 0.01 µg/g scopoletin. The $IC_{50}$ value in the DPPH assay was 0.553 ± 0.001 µg/mL. At a dose of 400 mg/kgBW, EBM showed potential in reducing DAI scores. Colonic lesions improved in the EBM group (100-400 mg/kgBW) and had similar activity to the positive control group. Histopathological examination of colon tissue revealed a reduced severity score for EBM damage at the 400 mg/kgBW dose (3,0 ± 0,244) compared to the negative control group (10,8 ± 0,475). Administration of EBM reduced the expression of *tnf-α* and *il-6.* There was a difference in the expression of the *il-6* gene between the 400mg/KgBW EBM group (1,093 times) and the negative group (5,962 times) ($p<0.05$). There was also a difference in the expression of the *tnf-α* gene between the 400mg/KgBW EBM group (1,000 times) and the negative group (12,290 times) ($p<0.05$). In the bacterial phylum sequence analysis, there was an increase in the population of Actinomycetota, Ascomycota and Bacteroidota in the negative group, while Campylobacterota experienced a decrease. In the taxonomic class, Bacili, coriobacteria, erysipelotrichia, and saccharomycetes increased in the negative group. In conclusion, EBM has the potential to be developed as a preparation that can reduce the severity of UC conditions.

Keywords: Ulcerative Colitis, Ethanolic Extract of Morinda Fruit, *tnf-α*, *il-6, Firmicutes, Bacteriodetes.*