

INTISARI

Depresi adalah gangguan kejiwaan yang berkontribusi besar terhadap beban penyakit global. Penelitian sebelumnya melaporkan bahwa, daun pare (*Momordica charantia* Linn.) memiliki aktivitas sebagai antidepresan secara *in vivo*, namun hingga saat ini belum ada laporan terkait pengaruhnya terhadap kadar neurotransmitter. Berdasarkan hal tersebut, dilakukan penelitian untuk mengetahui aktivitas ekstrak etanolik daun pare sebagai antidepresan melalui pendekatan *in vivo*, penelusuran pengaruhnya terhadap perubahan kadar neurotransmitter, serta karakterisasi ekstrak berdasarkan kandungan senyawa β -sitosterol yang diduga sebagai senyawa marker antidepresan.

Penelitian ini diawali dengan pembuatan ekstrak dengan pelarut etanol 80% menggunakan metode *Ultrasonic Assisted Extraction* (UAE), lalu dikarakterisasi menggunakan *Fourier Transform Infrared Spectroscopy* (FTIR) dan *High Performance Thin Layer Chromatography* (HPTLC) densitometri. Selanjutnya dilakukan uji aktivitas antidepresan secara *in vivo* ekstrak tersebut dengan dosis 200 dan 400 mg/kg BB, senyawa β -sitosterol 30 mg/kg BB sebagai pembanding, NaCMC 1% sebagai kontrol negatif dan fluoxetine 2,6 mg/kg BB sebagai kontrol positif, menggunakan mencit Balb/c model *Chronic Unpredictable Mild Stress* (CUMS). Efek dievaluasi berdasarkan perubahan perilaku dan kadar neurotransmitter menggunakan ELISA kit.

Hasil penelitian menunjukkan bahwa daun pare mengandung senyawa aktif berpotensi sebagai antidepresan. Pada uji FTIR mengindikasikan adanya gugus fungsi mirip β -sitosterol. Pada uji HPTLC densitometri mengonfirmasi keberadaan β -sitosterol dengan kadar 0,06%. Pemberian ekstrak, β -sitosterol, dan fluoxetine pada mencit menunjukkan aktivitas antidepresan yang ditandai dengan penurunan *immobility time* serta peningkatan *feeding time*, aktivitas lokomotor, waktu pergerakan, dan jarak tempuh pergerakan. Kelompok ekstrak 400 dan fluoxetine menunjukkan peningkatan kadar serotonin (5-HT) dan norepinephrine (NE). Selain itu kelompok ekstrak 200 dan 400, β -sitosterol, fluoxetine meningkatkan kadar dopamin (DA) dan *Brain Derived Neurotrophic Factor* (BDNF), serta menurunkan kadar kortikosteron (CORT) signifikan ($p < 0,05$) dibandingkan kelompok NaCMC 1%. Kesimpulan penelitian ini adalah daun pare memiliki aktivitas sebagai antidepresan melalui perubahan perilaku dan neurotransmitter di otak, berpotensi dikembangkan sebagai obat herbal untuk mencegah dan mengobati depresi.

Kata Kunci: Depresi, *Momordica charantia* Linn., *behavioral*, neurotransmitter

ABSTRACT

*Depression is a mental disorder that contributes significantly to the global burden of disease. Previous studies have reported that bitter melon leaves (*Momordica charantia* Linn.) possess in vivo antidepressant activity; however, no reports have addressed their effects on neurotransmitter levels. Based on this, a study was conducted to investigate the antidepressant activity of the ethanolic extract of bitter melon leaves through an in vivo approach, to examine its influence on neurotransmitter level changes, and to characterize the extract based on its β -sitosterol content, which is presumed to be a marker compound for antidepressant activity.*

This study began with the preparation of an extract using 80% ethanol as the solvent via the Ultrasonic Assisted Extraction (UAE) method, followed by characterization using Fourier Transform Infrared Spectroscopy (FTIR) and High-Performance Thin-Layer Chromatography (HPTLC) densitometry. Subsequently, the antidepressant activity of the extract was evaluated in vivo at doses of 200 and 400 mg/kg body weight (BW), with β -sitosterol at 30 mg/kg BW as a reference compound, 1% NaCMC as a negative control, and fluoxetine at 2.6 mg/kg BW as a positive control, using Balb/c mice in a Chronic Unpredictable Mild Stress (CUMS) model. The effects were assessed based on behavioral changes and neurotransmitter levels using an ELISA kit.

The study's results showed that bitter melon leaves contain active compounds with potential antidepressant properties. FTIR analysis indicated the presence of functional groups similar to β -sitosterol, while HPTLC densitometric analysis confirmed the presence of β -sitosterol at a concentration of 0.06%. Administration of the extract, β -sitosterol, and fluoxetine in mice demonstrated antidepressant activity, as evidenced by a reduction in immobility time and increased feeding time, locomotor activity, movement duration, and travel distance. The 400 mg/kg extract group and the fluoxetine group showed increased levels of serotonin (5-HT) and norepinephrine (NE). In addition, the 200 mg/kg and 400 mg/kg extract groups, β -sitosterol, and fluoxetine significantly ($p < 0.05$) increased dopamine (DA) and Brain-Derived Neurotrophic Factor (BDNF) levels, while significantly reducing corticosterone (CORT) levels compared with the 1% NaCMC group. The conclusion of this study is that bitter melon leaves exhibit antidepressant activity through behavioral and neurotransmitter changes in the brain, and have the potential to be developed as a herbal medicine for the prevention and treatment of depression.

Keywords: *Depression, *Momordica charantia* Linn., behavioral, neurotransmitter*