

**Pengaruh Pemberian Ekstrak Buah Merah Papua (*pandanus conoideus*)
Terhadap Kadar IL-10 dan BDNF pada Tikus
Model Cedera Otak Traumatik**

ABSTRAK

Latar Belakang

Cedera otak traumatik (COT) menyebabkan kematian dan disabilitas yang disertai proses inflamasi dan stres oksidatif berkelanjutan. IL-10 berperan sebagai sitokin antiinflamasi utama, sedangkan *Brain-Derived Neurotrophic Factor* (BDNF) berperan penting dalam neuroplastisitas dan pemulihan jaringan saraf. Buah merah Papua (*Pandanus conoideus Lam*) diketahui mengandung berbagai senyawa antioksidan dan antiinflamasi, di antaranya β -karoten, flavonoid, tokoferol, dan senyawa fenolik lainnya, yang berpotensi memberikan efek neuroprotektif. Penelitian ini bertujuan untuk mengetahui pengaruh pemberian ekstrak buah merah Papua terhadap kadar IL-10 dan BDNF pada tikus model cedera otak traumatik. **Metode:** Penelitian ini menggunakan rancangan eksperimental dengan desain *Post-Test Only Control Group Design* dan teknik *simple random sampling*. Subjek penelitian adalah 25 ekor tikus putih jantan (*Rattus norvegicus*) strain Wistar usia 8-12 minggu dengan berat badan 120-200 gram yang dibagi menjadi lima kelompok, yaitu kelompok kontrol sehat (HC), kelompok kontrol sakit (SC), serta tiga kelompok perlakuan ekstrak buah merah dengan dosis 100 mg/kgBB, 200 mg/kgBB, dan 400 mg/kgBB. Cedera otak traumatik diinduksi secara terkontrol menggunakan metode *weight drop injury* setelah anestesi ketamin 100 mg/kgBB, kecuali pada kelompok sehat. Ekstrak buah merah diberikan secara oral satu kali sehari selama 14 hari. Sampel darah diambil pada hari ke-15 untuk pemeriksaan kadar IL-10 dan BDNF menggunakan metode *Enzyme-Linked Immunosorbent Assay* (ELISA). Data dianalisis secara statistik untuk menilai perbedaan antar kelompok. **Hasil:** Hasil penelitian menunjukkan bahwa pemberian ekstrak buah merah Papua meningkatkan kadar IL-10 dan BDNF dibandingkan kelompok kontrol sehat dan kelompok kontrol sakit. Peningkatan yang signifikan secara statistik ($p < 0,05$) ditemukan pada kelompok perlakuan dosis 200 mg/kgBB dan 400 mg/kgBB. Rerata kadar IL-10 tertinggi ditemukan pada EBM3 ($214,0 \pm 8,464$) sedangkan kadar BDNF peningkatan stabil pada EBM2 ($2,195 \pm 0,2559$) dan EBM3 ($2,344 \pm 0,4071$). Temuan ini menunjukkan bahwa ekstrak buah merah memiliki potensi sebagai agen antiinflamasi dan neuroprotektif melalui peningkatan IL-10 dan BDNF. **Kesimpulan:** Pemberian ekstrak buah merah mampu meningkatkan kadar IL-10 dan BDNF pada tikus model COT.

Kata Kunci: COT, Ekstrak buah merah Papua (*pandanus conoideus Lam*), IL-10, BDNF.

The Effect of Papua Red Fruit Extract (*Pandanus conoideus*) on IL-10 and BDNF Levels in Rats Model of Traumatic Brain Injury

ABSTRACT

Background

Traumatic brain injury (TBI) causes death and disability accompanied by ongoing inflammation and oxidative stress. IL-10 acts as the main anti-inflammatory cytokine, while Brain-Derived Neurotrophic Factor (BDNF) plays an important role in neuroplasticity and nerve tissue recovery. Papua red fruit (*Pandanus conoideus* Lam) is known to contain various antioxidant and anti-inflammatory compounds, including β -carotene, flavonoids, tocopherols, and other phenolic compounds, which have the potential to provide neuroprotective effects. This study aims to determine the effect of Papua red fruit extract administration on IL-10 and BDNF levels in a traumatic brain injury rat model. **Methods:** This study used an experimental design with a Post-Test Only Control Group Design and simple random sampling technique. The research subjects were 25 male white rats (*Rattus norvegicus*) of the Wistar strain, aged 8-12 weeks with a body weight of 120-200 grams, which were divided into five groups, namely the healthy control group (HC), the sick control group (SC), and three treatment groups with red fruit extract at doses of 100 mg/kgBW, 200 mg/kgBW, and 400 mg/kgBW. Traumatic brain injury was induced in a controlled manner using the weight drop injury method after ketamine anesthesia at 100 mg/kgBW, except in the healthy group. Red fruit extract was administered orally once a day for 14 days. Blood samples were taken on day 15 to examine IL-10 and BDNF levels using the Enzyme-Linked Immunosorbent Assay (ELISA) method. The data were statistically analyzed to assess the differences between groups. **Results:** The results showed that administration of red fruit extract increased IL-10 and BDNF levels compared to the healthy control group and the sick control group. A statistically significant increase ($p < 0.05$) was found in the 200 mg/kgBW and 400 mg/kgBW treatment groups. The highest mean IL-10 level was found in EBM3 (214.0 ± 8.464), while BDNF levels increased steadily in EBM2 (2.195 ± 0.2559) and EBM3 (2.344 ± 0.4071). These findings indicate that red fruit extract has potential as an anti-inflammatory and neuroprotective agent through the increase in IL-10 and BDNF. **Conclusion:** Administration of red fruit extract was able to increase IL-10 and BDNF levels in TBI model rats.

Key words: COT, Papua red fruit extract (*Pandanus conoideus*), IL-10, BDNF