

## ***Abstract***

*Peptic ulcer and gastric mucosal injury remain significant global health problems, often induced by ethanol exposure, inflammation, oxidative stress, and imbalance between protective and aggressive factors in the stomach. Fermented lotus root (*Nelumbo nucifera*) has gained scientific interest due to its enhanced bioactive content following fermentation with *Saccharomyces cerevisiae*, while food replacement “X”, containing purple sweet potato, is known for its antioxidant and mucosal-protective properties. This study aimed to compare the gastroprotective effectiveness of fermented lotus root and food replacement “X” on ethanol-induced gastric mucosal damage in *Rattus norvegicus*. Fifteen male rats (200–250 g) were acclimatized for seven days and divided into three groups: control, fermented lotus root, and food replacement “X” (n = 5). Gastric injury was induced using 60% ethanol with 150 mM HCl. Treatments were administered orally for 14 days. Gastric tissues were collected for macroscopic lesion scoring and histopathological evaluation using hematoxylin–eosin staining. Data were analyzed using one-way ANOVA followed by post-hoc testing. The results showed that fermented lotus root produced greater improvement in mucosal integrity, reduced lesion index, and better epithelial regeneration compared to food replacement “X”. Histological findings demonstrated decreased inflammation and increased preservation of gastric architecture in the fermented lotus root group. In conclusion, fermented lotus root exhibited superior gastroprotective activity, indicating its potential as a natural therapeutic alternative for gastric mucosal injury.*

***Keywords:*** *Ethanol–HCl Injury; Fermented Lotus Root; Gastric Protection; Histopathology; Rattus Norvegicus.*

## **Abstrak**

Penyakit tukak lambung dan kerusakan mukosa lambung masih menjadi masalah kesehatan global yang signifikan, terutama akibat paparan etanol, peradangan, stres oksidatif, serta ketidakseimbangan faktor protektif dan agresif pada lambung. Fermentasi akar teratai (*Nelumbo nucifera*) diketahui meningkatkan kandungan senyawa bioaktif melalui proses fermentasi menggunakan *Saccharomyces cerevisiae*. Sementara itu, food replacement “X”

yang berbahan dasar ubi ungu juga memiliki aktivitas antioksidan dan pelindung mukosa. Penelitian ini bertujuan membandingkan efektivitas gastroprotektif fermentasi akar teratai dan food replacement “X” terhadap kerusakan mukosa lambung yang diinduksi etanol pada tikus *Rattus norvegicus*. Sebanyak 15 ekor tikus jantan (200–250 g) diaklimatisasi selama tujuh hari dan dibagi menjadi tiga kelompok: kontrol, fermentasi akar teratai, dan food replacement “X” (n = 5). Kerusakan lambung diinduksi menggunakan etanol 60% dan HCl 150 mM. Perlakuan diberikan secara oral selama 14 hari. Jaringan lambung diambil untuk pengukuran indeks lesi dan pemeriksaan histopatologi dengan pewarnaan hematoksilin–eosin. Analisis data menggunakan ANOVA satu arah dan uji post-hoc. Hasil penelitian menunjukkan bahwa fermentasi akar teratai memberikan perbaikan yang lebih besar pada integritas mukosa, penurunan indeks lesi, serta regenerasi epitel yang lebih baik dibandingkan food replacement “X”. Secara histologis, kelompok fermentasi akar teratai menunjukkan penurunan inflamasi dan struktur mukosa yang lebih terjaga. Kesimpulannya, fermentasi akar teratai memiliki aktivitas gastroprotektif yang lebih tinggi dan berpotensi menjadi terapi alami untuk kerusakan mukosa lambung.

**Kata kunci:** Etanol–HCl; Fermentasi Akar Teratai; Gastroprotektif; Histopatologi; Tikus *Rattus Norvegicus*.