

EFEKTIVITAS VARIASI DOSIS IRADIASI SINAR GAMMA DAUN KELOR TERHADAP KADAR TOTAL SAPONIN DAN AKTIVITAS ANTIBAKTERI *Streptococcus mutans*

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ABSTRAK

Daun kelor (*Moringa oleifera*) diketahui mengandung senyawa bioaktif, salah satunya saponin yang berpotensi sebagai antibakteri. Iradiasi sinar gamma merupakan metode yang dapat memodifikasi kandungan senyawa aktif bahan alam. Penelitian ini bertujuan untuk menganalisis efektivitas variasi dosis iradiasi sinar gamma terhadap kadar total saponin dan aktivitas antibakteri *Streptococcus mutans*. Sampel yang digunakan berupa ekstrak etanol daun *M. oleifera* hasil iradiasi sinar gamma dengan dosis 0; 2,5; 5,0; 7,5; dan 10 kGy. Ekstraksi dilakukan menggunakan metode ultrasonik. Penetapan kadar total saponin dilakukan dengan metode spektrofotometri UV-Vis menggunakan reagen anisaldehida, sedangkan uji aktivitas antibakteri dilakukan dengan metode difusi cakram terhadap *Streptococcus mutans*. Hasil penelitian menunjukkan bahwa iradiasi sinar gamma berpengaruh signifikan terhadap kadar total saponin dan aktivitas antibakteri. Dosis iradiasi 7,5 kGy menghasilkan kadar total saponin tertinggi sebesar 439,852 mgSAE/g ekstrak dan menunjukkan perbedaan signifikan antar perlakuan dosis ($P < 0,05$). Selain itu, dosis 7,5 kGy juga memberikan aktivitas antibakteri paling optimal dengan diameter zona hambat berkisar antara 3,23–3,97 mm terhadap *Streptococcus mutans*. Hasil uji korelasi variasi dosis iradiasi sinar gamma menunjukkan korelasi kuat terhadap kadar total saponin dan sangat kuat terhadap aktivitas antibakteri *Streptococcus mutans*.

Kata kunci : Daun kelor, iradiasi sinar gamma, saponin, *Streptococcus mutans*, rendemen

EFFECTIVENESS OF VARIATIONS IN MORINGA LEAF GAMMA RAYS IRRADIATION DOSES ON TOTAL SAPONIN LEVELS AND ANTIBACTERIAL ACTIVITY OF *Streptococcus mutans*

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ABSTRACT

Moringa oleifera leaves are known to contain bioactive compounds, including saponin, which has antibacterial potential. Gamma ray irradiation is a method that can modify the active compound content of natural ingredients. This study aims to analyze the effectiveness of variations in gamma ray irradiation doses on total saponin content and antibacterial activity of *Streptococcus mutans*. The sample used was an ethanol extract of *M. oleifera* leaves irradiated with gamma rays doses of 0; 2,5; 5; 7,5; and 10 kGy. Extraction was performed using an ultrasonic method. Total saponin levels were determined using UV-Vis spectrophotometry using anisaldehyde reagent, while antibacterial activity was tested using the disc diffusion method against *Streptococcus mutans*. The results showed that gamma ray irradiation significantly affected total saponin levels and antibacterial activity. The irradiation dose of 7,5 kGy produced the highest total saponin content of 439,852 mgSAE/g extract and showed significant differences between doses. In addition, the 7,5 kGy doses also provided the most optimal antibacterial activity with an inhibition zone diameter ranging from 3.23–3.97 mm against *Streptococcus mutans*. Based on correlation statistical analysis, variations in gamma-ray irradiation dose showed strong correlation for total saponin levels and very strong with the antibacterial activity of *Streptococcus mutans*.

Keywords : *Moringa* leaves, gamma ray irradiation, saponin, *Streptococcus mutans*, yield