

*Application of the High Pulse Electric Field Method to Reduce Hydrogen Cyanide
Content in Rubber Seeds*

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ABSTRACT

*Rubber seeds (*Hevea brasiliensis*) are abundant in Indonesia and have potential as a high-protein food source, but their utilization is constrained by the presence of hydrocyanic acid (HCN) in the form of linamarin. This study evaluated the effectiveness of High Pulsed Electric Field (HPEF), a non-thermal technology, in reducing HCN levels in rubber seeds and its effect on protein and moisture content, using a Factorial Completely Randomized Design with electrode distance (0.5–1.5 cm) and exposure time (3–7 minutes). Electrode distance had a highly significant effect on reducing HCN content ($F = 3441.867$; $p = 0.000$), while exposure time ($F = 0.067$; $p = 0.936$) and the interaction between electrode distance and time ($F = 2.267$; $p = 0.142$) had no significant effect, with HCN levels decreasing from 194.30 mg/100 g to 4.20–4.50 mg/100 g (a 97–98% reduction) at the widest electrode distance. Electrode distance also significantly affected protein content ($F = 25.049$; $p = 0.000$), whereas exposure time ($p = 0.395$) and its interaction ($p = 0.507$) did not show significant effects. Moisture content was not significantly affected by electrode distance, HPEF time, or their interaction ($p = 0.150$; $p = 0.829$; and $p = 0.665$, respectively), and was more determined by raw material heterogeneity. HPEF proved to be a promising non-thermal alternative for detoxifying rubber seeds, although the final HCN content (42–45 ppm) still remained above the safe consumption limit of 10 ppm, indicating that further processing is required to make the product safe for consumption.*

Keywords: *electroporation, High Pulsed Electric Field, hydrogen cyanide, rubber seeds, non-thermal detoxification.*