

**Kajian Filter Air Baku Berbasis Endokarp Biji Mangga (*Mangifera indica*)
Sebagai Material Bio-Adsorben** (*Study of Raw Water Filters Based on Mango
Seed Endocarp (*Mangifera indica*) as Bio-Adsorbent Material*).
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ABSTRACT

*Lead (Pb) heavy metal contamination in clean water requires further filtration. This study aims to test the bio-adsorbent membrane from the endocarp of mango seeds (*Mangifera indica*) through a filtration system. Membrane performance was evaluated based on the soaking time of the $ZnCl_2$ activator: control (P0), 24 hours (P1), 36 hours (P2), and 72 hours (P3). Through the Analytic Hierarchy Process (AHP) method, P3 was selected as the best treatment with the characteristics of a solid, compact membrane and high pore density. The P3 treatment provided the fastest filtration time (1,155.6 seconds), the highest flow rate (0.08653 mL/s), a filtration rate of (3.5659 mL·cm²/s), and a swelling value between 72.93% - 217.45%. The AAS test of the P3 membrane showed a reduction in Pb heavy metal levels of 44.84%, stable pH (7.10), and the highest reduction in turbidity of 64.5% (82 NTU to 29.4 NTU). From the financial aspect, P3 requires operational costs of Rp. 2,008,357, HPP of Rp. 5,021/unit, and a selling price of Rp. 8,013/unit. As well as the added value analysis of the Hayami method of Rp. 2,409,686 (ratio of 37.50%). Overall, the utilization of mango seed endocarp skin waste into a bio-adsorbent membrane as an efficient, economical, and sustainable raw water filter.*

Key words : *Mango Seed Endocarp, Bio-Adsorbent Membrane, Water Filtration, Lead (Pb)*