

Purification performance of coconut fibers, palm kernel fibers, and shredded plastic bottles in biofilter septic tanks: efficiency and limitations 🛒

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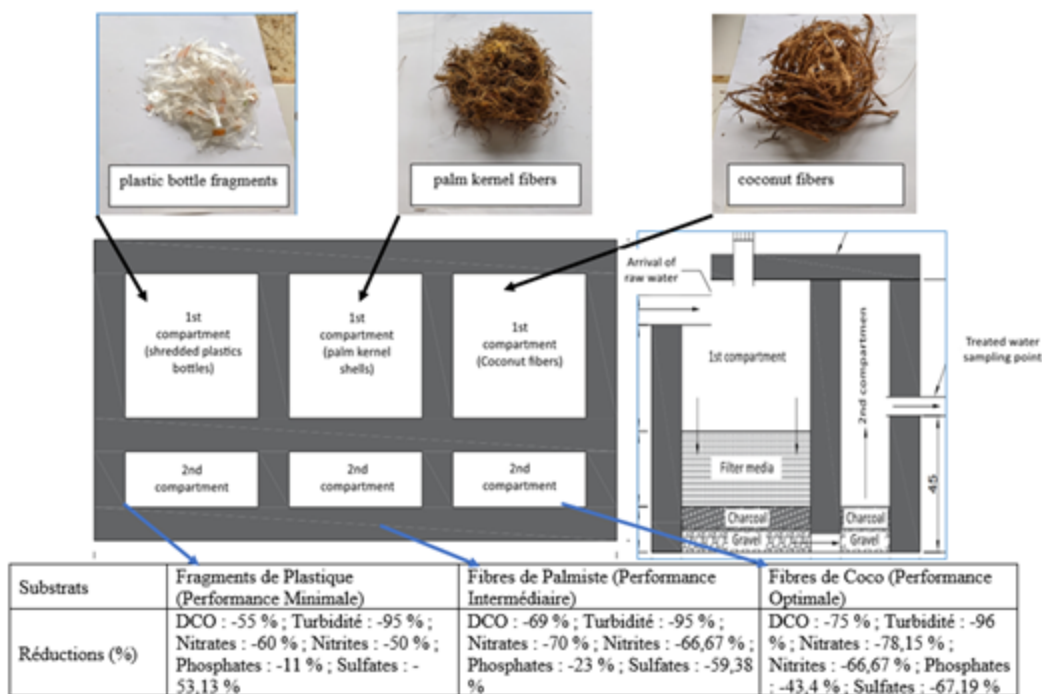


Water Practice and Technology wpt2026473.

<https://doi.org/10.2166/wpt.2026.473> Article history 🕒

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ABSTRACT



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This study conducted over 56 days evaluates the purifying efficiency of three organic and synthetic substrates: coconut fibers, palm kernel fibers, and plastic bottle fragments within a biofiltration wastewater treatment system. The experimental device consists of three bi-compartmentalized units (effective capacity of 259 L; hydraulic retention time of 40 h), incorporating filter beds composed of gravel, charcoal, and the materials under test. Analysis of physicochemical parameters reveals a marked superiority of coconut fibers for pollutant removal: COD (–75%), turbidity (–96%), nitrates (–78.15%), nitrites (–66.67%), phosphates (–43.4%), and sulfates (–67.19%). Palm kernel fibers show intermediate performance with respective reductions of 69% (COD), 95% (turbidity), 70% (nitrates), 66.67% (nitrites), 23% (phosphates), and 59.38% (sulfates). Shredded plastic bottles display the lowest yields: COD (–55%), turbidity (–95%), nitrates (–60%), nitrites (–50%), phosphates (–11%), and sulfates (–53.13%). Although pH neutralization is observed, an increase in BOD5 was recorded, particularly for organic substrates, suggesting a specific biological dynamic within the biofilters.

biofiltration, depollution, efficiency, environment, pollution, wastewater

Keywords: [biofiltration](#), [depollution](#), [efficiency](#), [environment](#), [pollution](#), [wastewater](#)

Water Practice & Technology

EISSN 1751-231X

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