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Smart Bioshield: A Sustainable Wall Proofing Solution against Fungi and Termites

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Across humid regions, people silently battle a hidden enemy, walls darkened by fungal growth and weakened by relentless termites. Beyond the stains and cracks lies a heavier toll: respiratory illnesses, allergies, structural damage, and mounting financial burdens. Conventional chemical wall-proofing solutions, though common, often worsen the problem by releasing toxic residues that compromise both human health and the environment. This study explores a sustainable, bio-based alternative, an organic wall- proofing coating derived from indigenous plants with inherent antifungal and anti-termite properties. Extracts were evaluated through phenolic content assays, antifungal inhibition tests, cellulase inhibition assays, and termite mortality studies. Preliminary findings reveal strong antifungal activity against common indoor molds and significant termite repellency, along with the potential for hydrophobic wall adherence. These results illuminate the promise of an eco-friendly shield that is both safe for humans and gentle on the environment. This work demonstrates how harnessing simple, nature-inspired solutions can reimagine indoor protection, bridging industrial microbiology and environmental biotechnology to address one of the most persistent challenges of daily life. Ultimately, this innovation aspires to transform the way we protect our homes and making them healthier, safer, and more sustainable for future generations.

Keywords: Antifungal coating, Anti-termite protection, Environmental biotechnology, Organic wall-proofing, Sustainable housing

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