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REDUCING AMMONIA, CHEMICAL OXYGEN DEMAND AND COLOR FROM PRAWN POND WASTEWATER USING COMPOSITE MEDIA

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Abstract

Low water quality due to high levels of ammonia, chemical oxygen demand (COD), abnormal pH, and undesirable water color is prevalent in many prawn ponds in Malaysia. A composite medium used in the treatment of prawn pond effluent was examined for the reduction of undesirable parameters. The composite medium is a mixture of limestone, activated carbon, zeolite, and rice husk. Experiments were conducted under three different conditions, i.e., sole aeration, adsorption, and adsorption with pre-aerated samples. For the experiment using pre-aerated samples, the best removal efficiencies achieved for ammoniacal nitrogen, COD, and color were 92%, 85%, and 96%, respectively. Adsorption behavior of the composite medium for ammonia, COD, and color was studied through the Freundlich and Langmuir adsorption models. The empirical constant (n) value of the Freundlich isotherm was greater than 1, implying beneficial adsorption for all the parameters tested in this study. Freundlich and Langmuir isotherms offered very good fit for all parameters studied with R^2 values above 0.95.

Key words: adsorption, composite media, isotherm, prawn pond wastewater

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