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Treatment performance of practical-scale down-flow hanging sponge reactor using sixth-generation hard sponge media

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ABSTRACT

A down-flow hanging sponge (DHS) reactor with a lateral partition was filled with sixth-generation sponge media (DHS-G6), polyethylene sponges stiffened with epoxy resin, and third-generation sponge media (DHS-G3), polyethylene sponges wrapped in a plastic net, in a continuous experiment at a sewage treatment plant in India to assess and compare the treatment performances of the two sponge media. No clear differences between the different media were found in the removal of biochemical oxygen demand (BOD), ammonium nitrogen, and fecal coliform. The best performance was obtained at a hydraulic retention time of 2 h. The concentrations of respective components in the water treated by the DHS-G3 and DHS-G6 were as follows: BOD, 5 and 7 mg L^{-1}; ammonium nitrogen, 4 and 6 mg N L^{-1}; and fecal coliform, 3.2×10^4 100 mL^{-1} and 3.9×10^4 100 mL^{-1}. Performance levels fully satisfying the Indian discharge standards were obtained for removal of BOD and ammonium nitrogen, but not fecal coliform.

Keywords: Sewage treatment; Down-flow hanging sponge; Sponge media; Removal of organics; Nitrification

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