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Nutrients removal from undiluted cattle farm wastewater by the two-stage process of microalgae-based wastewater treatment

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Abstract: *Chlorella vulgaris* was selected from five freshwater microalgal strains of Chlorophyta, and showed a good potential in nutrients removal from undiluted cattle farm wastewater. By the end of treatment, 62.30%, 81.16% and 85.29% of chemical oxygen demand (COD), ammonium (NH_4^+-N) and total phosphorus (TP) were removed. Then two two-stage processes were established to enhance nutrients removal efficiency for meeting the discharge standards of China. The process A was the biological treatment via *C. vulgaris* followed by the biological treatment via *C. vulgaris*, and the process B was the biological treatment via *C. vulgaris* followed by the activated carbon adsorption. After 3-5 d of treatment of wastewater via the two processes, the nutrients removal efficiency of COD, NH_4^+-N and TP were 91.24%-92.17%, 83.16%-94.27% and 90.98%-94.41%, respectively. The integrated two-stage process could strengthen nutrients removal efficiency from undiluted cattle farm wastewater with high organic substance and nitrogen concentration.

Keywords: nutrients removal, undiluted cattle farm wastewater, the two-stage process, *Chlorella vulgaris*

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