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ON THE POLLUTION WITH ANTIBIOTICS, HEAVY METALS AND CONVENTIONAL INDICATORS IN DIGESTED WASTEWATER FROM LARGE-SCALE PIG FARMS IN JIAXING CITY, CHINA

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Abstract

Occurrence of antibiotics and heavy metals, together with concentrations of conventional pollution indicators were assessed in digested piggery wastewater (DPW) generated in ten large-scale pig farms in Jiaxing City, China. Results showed that water quality of DPW varied in different farms as well as in different seasons. Digested piggery wastewater pollution tended to be less serious in Summer than in Spring, Autumn and Winter. Conventional pollution indicators of chemical oxygen demand (COD), total nitrogen (TN), ammonium nitrogen (NH_4-N) and total phosphorus (TP) in Spring ranged 1008 - 18479 mg/L, 205 - 2228 mg/L, 119 - 1936 mg/L and 32.6 - 306 mg/L, respectively, being four times higher than those in Summer. Pollution of antibiotics and heavy metals in DPW was very severe for all farms. Six heavy metals (copper, Cu; zinc, Zn; lead, Pb; cadmium, Cd; nickel, Ni; and chromium, Cr) and ten antibiotics (three tetracyclines, two sulfonamides, three macrolides and two quinolones) were detectable in all the ten farms. Copper and Zn accounted for 97 ± 3% of the total heavy metals concentrations, and their concentrations reached the discharge limits of 0.5 mg/L (Cu) and 1.5 mg/L (Zn) in most cases. The total concentrations of the ten antibiotics were in the range of 0.155 – 1,090 μg/L. Heavy metals and antibiotics should be given intensive attention during resource utilization and treatment of DPW.

Key words: antibiotics, heavy metals, piggery wastewater, resource utilization

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