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Occurrence of human and veterinary pharmaceuticals in river water, agricultural waste water and sewage treatment plant effluent in Japan.

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In recent years, pharmaceuticals in aquatic environment has come to receive much attention in Europe and North America due to their potential to increase antibiotic resistance in microorganism. Almost no data, however, has been reported from Japan. In this study, we will report the levels of human and veterinary pharmaceuticals in aquatic environment in Japan. Liquid chromatography tandem mass spectrometry was used to detect those compounds. The results indicated that some pharmaceuticals were detected in the ng/L level. In the river water, the concentrations of human pharmaceuticals in the urban area were higher than those in the suburban area while the pharmaceuticals mainly used for veterinary treatment were found in higher concentration in the suburban area than in the urban area. Human pharmaceuticals were also detected in the sewage treatment plant effluent. In agricultural waste water, some antibiotics for veterinary use were detected in high concentrations up to $\mu\text{g/L}$ level, which indicated possible ecological effect in the some limited area.