

Nationwide typical organism-derived drinking water odour incidents in China: characterization and causes (2007-2015)

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Abstract

Organism-derived odour in drinking water is always aesthetical and unlikely pose health problems to human. However, such drinking water is hardly acceptable by residents and often brings complaints, and thus poses great pressures to drinking water treatment plants and other related agencies. Up to date, it is still a big challenge to immediately determine the main related odourant and organism when an organism-derived drinking water odour incident occurs. This work summarized the seven main nationwide organism-related off-flavor drinking water incidents that occurred in the last decade. These odour incidents occurred in a broad of areas from Inner Mongolia in northern China to Southern Shenzhen. Most odour incidents happened during the summer-autumn season with relative high temperature range, while at extremely low water temperature of 1°C, odour incidents still occurred in northern regions. 2-MIB and/or geosmin are the two main odourous compounds responsible for five odour incidents, while the mixture of 2,4-heptadienal, n-hexanal, and n-heptanal, and the mixture of methyl mercaptan, dimethyl sulfide, and dimethyl trisulfide were the important odourants responsible for the other two odour incidents, respectively. *Dinobryon* sp, *Anabaena* spiroides, *Planktothrix* sp, *Phoridium* tergestinum and filamentous cyanobacteria were found to be the dominant algae that produce odourous compounds, which separately led to one odour incident, respectively. One odour incident was caused by the massive death of algae owing to the oxygen depletion and then microbiologically degradation. Which organism led to the odour remains unknown for another rest odour incident.