

PATHOGENIC FUNGAL OUTBREAKS AND DISINFECTION CONTROL IN DRINKING WATER SUPPLY SYSTEMS

Speaker

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Abstract

Pathogenic fungi have emerged as a globally recognized environmental issue in recent years, posing significant biological risks to water supply systems, with outbreaks reported in more than 30 countries worldwide. Human exposure can occur through drinking water, showering, and other domestic activities, posing particularly serious threats to immunocompromised populations such as the elderly and children. These exposures may result in acute and chronic respiratory infections, asthma, allergic reactions, and other health disorders, constituting a significant public health concern. However, substantial scientific gaps remain in the migration and transformation of pathogenic fungi in water supply systems, including outbreak mechanisms, chlorine resistance, and effective disinfection techniques. Based on over a decade of fundamental research, our team systematically elucidated the migration and transformation pathways of pathogenic fungi from source water to consumer taps, clarified contamination sources, and revealed growth and outbreak characteristics within distribution networks, highlighting the multiphase occurrence and latent biological risks in water supply systems. We further identified the pronounced chlorine resistance of pathogenic fungi and elucidated resistance mechanisms mediated by both individual traits and population-level interactions. Notably, we discovered an unprecedented mechanism by which chlorine resistance is enhanced through interactions with metal ions. Subsequently, a comprehensive framework for fungal disinfection in drinking water was established. This work fills a long-standing theoretical gap and provides a solid scientific basis for the effective prevention and control of pathogenic fungi in water supply systems.

Biography

Dr. Gang Wen is a Professor and Associate Dean of the School of Environmental and Municipal Engineering at Xi'an University of Architecture and Technology. His research focuses on drinking water safety in source waters and supply systems, as well as advanced oxidation and disinfection technologies.

As a National High-Level Young Talent and the leader of a Shaanxi Provincial Key Scientific and Technological Innovation Team on drinking water, Dr. Wen has led or participated in more than 40 research projects, including one National Key R&D Program project, five NSFC projects, and eight provincial- or ministerial-level projects. Dr. Wen holds over 20 granted invention patents and has published over 200 scientific papers, including more than 100 as first or corresponding author such as Environmental Science & Technology and Water Research. His awards include the First Prize of Shaanxi Provincial Science and Technology Progress Award, the Second Prize of the China Environmental Protection Science and Technology Award, and multiple national and provincial innovation awards. Dr. Wen is a recipient of Baosteel Excellent Teacher Award, and his course Water Analytical Chemistry was recognized as a National Top-Tier Course.

Dr. Wen currently serves as an editorial board member of WST and Water; Vice Chair of CWA-YPC; member of ACS; and member of the Working Group of the Water Disinfection and Disinfection By-Products Symposium.



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**Room 3574 (Lift 27/28),
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