

## **Cyanotoxins availability and detection methods in wastewater treatment plants: A review**

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### **Abstract**

Research interest in ecological significance, toxicity, and potential applications of cyanobacterial metabolites has grown as a result of the current extensive cyanobacterial blooms in water bodies. Under favourable conditions, specific cyanobacterial species release cyanotoxins, hepatotoxins, dermatotoxins, neurotoxins, and cytotoxins, creating a heightened threat to aquatic ecosystems and human health. Wastewater treatment plants (WWTPs) offer one of the best culture media for cyanobacterial development and synthesis of cyanotoxins by providing optimum environmental conditions, including temperature, light intensity, lengthy water residence time, and nutrient-rich habitat. To discover the intricate relationships between cyanobacterial populations and other living organisms, it is important to comprehend the cyanobacterial communities in the ecology of WWTPs. Monitoring strategies of these cyanotoxins typically involved combined assessments of biological, biochemical, and physicochemical methodologies. Microscopic observations and physicochemical factors analysis cannot be carried out for toxicity potential analysis of blooms. Due to their high sensitivity, molecular-based approaches allow for the early detection of toxic cyanobacteria, while biological analysis is carried out by using water bloom material and cell extracts to screen cyanotoxins build up in organisms. As each approach has benefits and drawbacks, the development of an integrated multi-method laboratory system is essential to obtain trustworthy results and accurate detection of cyanotoxin levels in WWTPs allowing us to take necessary proactive and preventative approaches for effective wastewater treatment.

### **Citation**

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