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 **Microcystin-LR and natural organic matter removal by biologically active carbon filters**

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**Abstract:** Microcystin-LR (MC-LR) occurrence in surface water bodies is a worldwide issue of increasing concern due to climate change/global warming and their resistance to conventional treatment. The biologically active carbon filters (BACs), where both adsorption and biodegradation take place, are a promising option for upgrading the treatment plants, but the synergistic effects occurring in BAC filters are a key to success and are yet to be fully understood.

This study addresses the effects of background natural organic matter (NOM) and empty bed contact time (EBCT) on BAC performance for MC-LR removal. Biodegradation was assessed in long-term lab runs and showed that: MC-LR biodegradation occurred only in the presence of biodegradable NOM; the biological activity was relevant for MC-LR removal by BAC, it minimized the BAC efficiency decay along the operation time and was higher for shorter EBCTs, i.e. higher loading rates of substrates and oxygen.

**Keywords:** drinking water treatment, GAC filter, cyanotoxin, NOM, biodegradation