

Responses of two typical harmful cyanobacteria to extracts of

The frequent occurrence of cyanobacterial blooms poses severe threats to the global environment and to local human health. Therefore, it is vital to develop effective methods to control blooms. *Phalaris arundinacea*, a dominant hygrophite in the Lake Poyang wetland, decomposes when submerged during high-water-level periods. Through indoor cultivation experiments, we examined the effects of crude aqueous, ethyl acetate, dichloromethane and petroleum ether extracts of *P. arundinacea* on the growth of typical harmful bloom-forming cyanobacteria (*Microcystis aeruginosa* and *Dolichospermum flos-aquae*). The results revealed that the crude aqueous extract of *P. arundinacea* significantly inhibited the growth of *M. aeruginosa* and *D. flos-aquae*, with average inhibition rates of 86.77 per cent and 80.08 per cent, respectively. The inhibitory effect generally increased with time and dose, with maximum inhibition rates of 99.15 per cent for *M. aeruginosa* and 97.27 per cent for *D. flos-aquae*. *P. arundinacea* crude extracts obtained with ethyl acetate, dichloromethane and petroleum ether reduced the cell density and chlorophyll a concentration of *M. aeruginosa*. Among the extracts, the petroleum ether extract had the strongest inhibitory effect. Generally, the inhibition rates of these three crude organic solvent extracts peaked on Day 8 or Day 12 of the experiment. The results confirmed that *P. arundinacea*, a dominant hygrophite in Lake Poyang, has significant potential for controlling harmful cyanobacterial blooms through the release of allelochemicals and likely plays an important role in this process in summer. Therefore, this study offers novel insights and materials for the prevention and management of cyanobacterial blooms in the future.

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Obtenir le document : EDP Sciences

Mots clés : Harmful bloom-forming cyanobacteria, Extract, Inhibitory effects, Lake Poyang

Date : 2025-04-25

Format : text/xml

Source : <https://doi.org/10.1051/kmae/2025003>

Langue : Anglais

Télécharger les documents : <https://www.kmae-journal.org/10.1051/kmae/2025003/pdf>

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