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Abstract

Lake Naivasha, an important inland water ecosystem and a crucial freshwater resource in the Great African Rift Valley, has displayed clear signals of degradation in recent decades. We studied the phytoplankton composition and biomass levels in the period 2001–2013 and noted a progressive increase in the occurrence of potentially toxic cyanobacteria. Analyses for the presence of cyanotoxins such as microcystins (MC), cylindrospermopsin (CYN) and anatoxin-a (ATX-a) were carried out on samples collected in 2008–2013. Among the cyanotoxins tested, low concentrations of MC were detected in the lake. This is the first record of the occurrence of MC in Lake Naivasha. For the first time, molecular phylogenetic investigations of field clones of cyanobacteria from Lake Naivasha were carried out to establish the taxa of the dominant species. Amplification of the aminotransferase (AMT) domain responsible for cyanotoxin production confirmed the presence of the *mcyE* gene belonging to the microcystin synthesis gene cluster in field samples containing *Microcystis* and *Planktothrix* species. These findings suggest that toxin producing cyanobacteria could become a threat to users of this over-exploited tropical lake in the near future.

Keywords

- Cyanobacteria;
- Cyanotoxins;
- Lake Naivasha;
- *Microcystis*;
- *Planktothrix*