

Ballot, A., Krienitz, L., Kotut, K., Wiegand, C. & Pflugmacher, S. 2005. Cyanobacteria and cyanobacterial toxins in the alkaline crater lakes Sonachi and Simbi, Kenya. *Harmful Algae* 4: 139-150.

Abstract

The phytoplankton communities and the production of cyanobacterial toxins were investigated in two alkaline Kenyan crater lakes, Lake Sonachi and Lake Simbi. Lake Sonachi was mainly dominated by the cyanobacterium *Arthrospira fusiformis*, Lake Simbi by *A. fusiformis* and *Anabaenopsis abijatae*. The phytoplankton biomasses measured were high, reaching up to 3159 mg l⁻¹ in L. Sonachi and up to 348 mg l⁻¹ in L. Simbi. Using HPLC techniques, one structural variant of the hepatotoxin microcystin (microcystin-RR) was found in L. Sonachi and four variants (microcystin-LR, -RR, -LA and -YR) were identified in L. Simbi. The neurotoxin anatoxin-a was found in both lakes. To our knowledge this is the first evidence of cyanobacterial toxins in L. Sonachi and L. Simbi. Total microcystin concentrations varied from 1.6 to 12.0 µg microcystin-LR equivalents g⁻¹ DW in L. Sonachi and from 19.7 to 39.0 µg microcystin-LR equivalents g⁻¹ DW in L. Simbi. Anatoxin-a concentrations ranged from 0.5 to 2.0 µg g⁻¹ DW in L. Sonachi and from 0 to 1.4 µg g⁻¹ DW in L. Simbi. In a monocyanobacterial strain of *A. fusiformis*, isolated from L. Sonachi, microcystin-YR and anatoxin-a were produced. The concentrations found were 2.2 µg microcystin g⁻¹ DW and 0.3 µg anatoxin-a g⁻¹ DW. This is the first study showing *A. fusiformis* as producer of microcystins and anatoxin-a. Since *A. fusiformis* occurs in mass developments in both lakes, a health risk for wildlife can be expected.

Keywords

- Anatoxin-a;
- *Arthrospira fusiformis*;
- *Anabaenopsis abijatae*;
- Lake Simbi;
- Lake Sonachi;
- Microcystin