

The food web of the saline-alkaline Lake Nakuru is dominated by the cyanobacterium *Arthrospira fusiformis* as the primary producer and a huge population of Lesser Flamingos as direct consumers. However, the dense blooms of *Arthrospira* are not stable, and collapse irregularly and unpredictably. During such periods they are replaced by other algae or cyanobacteria. The wide fluctuation in the cyanobacterial and algal populations of Lake Nakuru has a great influence on food availability for Lesser Flamingos, and is therefore of high ecological importance. To support the descriptive work on these phenomena, we describe here a new cyanobacterial taxon from this soda lake: *Haloleptolyngbya alcalis* Dadheech, Mahmoud, Kotut et Krienitz gen. et sp. nov. The study was based on multilocus molecular analyses of 16S rRNA gene, 16S-23S internal transcribed spacer, partial sequences of beta and alpha subunits including intergenic spacer (*cpcBA*-IGS) of phycocyanin operon, phenotypic features using light microscopy, scanning electron microscopy, transmission electron microscopy, and ecology. The new taxon established a separate lineage within the family of *Peudanabaenaceae* (*Oscillatoriales*).