Dadheech, P.K., Ballot, A., Casper, P., Kotut, K., Novelo, E., Lemma, B, Proschold, T. & Krienitz, L. 2010. Phylogenetic relationship and divergence among planktonic strains of Arthrospira (Oscillatoriales, Cyanobacteria) of African, Asian and American origin deduced by 16S–23S ITS and phycocyanin operon sequences. Phycologia, 49 (4): 361–372.

Abstract

Arthrospira comprises multicellular, cylindrical, usually screwlike coiled trichomes and is cultivated commercially. In this study, 33 new strains of *Arthrospira* isolated from plankton samples collected in Mexico, East Africa and India were investigated and compared with 53 strains or samples of earlier considerations. The study included observations of morphological features and molecular phylogenetic analyses on the basis of nucleotide sequences of internal transcribed spacer (ITS) between 16S rRNA and 23S rRNA genes and partial sequences of beta and alpha subunits including intergenic spacer (*cpc*BA-IGS) of phycocyanin operon. Morphological traits of *Arthrospira* such as trichome width, type of coiling and apical cell were not always consistent in culture conditions. It was revealed that *Arthrospira* phylogeny on the basis of *cpc*BA-IGS locus was broadly comparable with the ITS region as both phylogenetic trees derived from nucleotide sequences could be divided into two main clusters. Cluster I comprised sequences from American strains mainly, whereas cluster II contained the sequences of the strains originating from Africa and Asia chiefly. Both genetic regions of the strains investigated in the present study coincidently showed a significant sequence divergence among *Arthrospira* strains from East Africa, India and Mexico indicating possible distinct evolutionary lineages.

Keywords

Cyanobacteria, Oscillatoriales, *Arthrospira*, Phylogeny, Phycocyanin operon, ITS, Mexico, Africa, India