IFS. Pub-48

Determination of microcystin producing ability of cyanobacteria using PCR assays: microcystin - a potential risk factor for human health

Wanigatunge RP, Magana-Arachchi DN and Chandrasekaran NV

Institute of Fundamental Studies, Hantana Road, Kandy.

The presence of hepatotoxic microcystin in surface waters used for drinking and recreation is receiving increasing attention around the world as a public health concern. There are two aspects of microcystin damage to the liver including progressive active liver injury and the potential for promotion of tumour growth. This study was conducted to identify the potential microcystin producing cyanobacteria using PCR assays.

A total of 19 cyanobacterial mono cultures, belonging to the order Oscillatoriales and order Chroococcalesby previous sequencing and identification were used for the present study. The cyanobacterial cultures were originated from water samples collected from specific reservoirs which were maintained in cyano specific BG11 medium. Genomic DNA was extracted from the cultures and was purified using Boom's method. PCR amplification was carried out with previously described primers HEPF/HEPR for the mcyE gene of the microcystin synthesis pathway.

The tested Microcystis aeruginosa BL1, Microcystis aeruginosa UL, Microcystis aeruginosa N11 gave ~ 472bp PCR fragment. Order Oscillatoriales cyanobacteria H1, H2, H5, D3a, J4, MI2, Plectonemasp.YRS3, Leptolyngbyasp. DPW4, Chroococcidiopsis sp. M3, Chroococcidiopsis sp. AP2, Chroococcidiopsis sp. 1R, Chroococcidiopsis sp. L5, Chroococcidiopsis sp. YRS4a and Chroococcidiopsis sp. Batti 6.2 gave positive amplification while order Oscillatoriales cyanobacterium H6 and Plectonema sp. YRS12 gave null amplification.

The presence of *mcyE* genein the microcystin synthetase gene cluster confirmed the genetic potential of microcystin production for tested cyanobacterial isolates except Oscillatoriales cyanobacterium H6 and *Plectonema* sp. YRS12.Microcystin might be a major risk factor for human illness due to long or short term exposure through drinking or recreation activities. Thus, early detection of potential microcystin producing cyanobacteria in water reservoir is advisable in order to avoid public health problems.

Key words: Microcystin, cyanobacteria, PCR assays, risk factor, human health.