Optimization of a standard method for enumeration of total cell counts of colonial *Microcystis aeruginosa* in environmental samples collected from Boralasgamuwa Lake, Sri Lanka

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Abstract

Effectiveness of alkaline hydrolysis, heating and regression method for enumeration of cells of *Microcystis aeruginosa* was assessed using water samples collected from Boralasgamuwa lake during the bloom period from 15th February to 15th May 2013. Alkaline hydrolysis was performed using; 0.01, 0.1 and 1.0 M of NaOH with a control. Alkaline hydrolysis at 80^0C with NaOH for 15 minutes followed by 30s vortexing produced single cells of all the test samples. A total of $2.34 \pm 0.11 \times 10^5$ cells/ml of single cells were generated during hydrolysis with 0.01 M NaOH. The use of higher NaOH molarities resulted in cell losses. The control sample which contained only distilled water resulted highest numbers of single cells ($2.89 \pm 0.01 \times 10^5$ cells/ml). The heating method was employed by heating *M. aeroginosa* colonies at 40 ^{0}C, 60 ^{0}C,70 ^{0}C,80 ^{0}C and 90 ^{0}C for 15 minutes. Heating at 80^0C for 15 min, followed by 30s vortex-mixing produced a suspension of single cells with $2.76 \pm 0.81 \times 10^5$ cells/ml. A standard plot was developed for the direct enumeration of cell number against the area of *M.aeroginosa* colonies using 30 selected colonies. The standard plot slightly overestimated the cell counts during enumeration ($2.98\ 0 \pm .51 \times 10^5$ cells/ml).

Key words: Enumeration of cell counts, *Microcystis aeruginosa*, Alkaline hydrolysis, Heating method