



Abstract

Antibacterial Activity of Cyanobacterial Extracts against *Legionella* spp. †

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Abstract: Cyanobacteria are recognized sources of natural compounds with a pharmaceutical interest, namely for their antimicrobial activity. Several studies have shown the inhibitory effect of cyanobacteria against the most common bacterial pathogens. However, the bioactivity against *Legionella pneumophila* was never reported. *L. pneumophila* is ubiquitous in water environments and causes respiratory infections through water–air transmission. A rise in *Legionella* outbreaks might be expected, considering that climate changes will exacerbate water-borne diseases. In this work, we evaluated the antibacterial potential of 25 freshwater cyanobacteria from ESSACC collection, against seven *Legionella* strains (two reference, two clinical and three environmental). Cyanobacterial biomass was extracted with n-hexane, dicloromethane:methanol (2:1), methanol 70%, and water and extracts were dried and dissolved in DMSO (25%). The disk diffusion method was adapted to *Legionella* growth using 1 McFarland suspension in BCYE plates. Levofloxacin (10 µg) and DMSO (25%) were used as positive/negative controls, respectively. Methanolic extracts from *Dolichospermum flos-aquae* (LMACYA 165), *Limnothrix redekei* (LMACYA 145), *Microcystis aeruginosa* (LMACYA 127) and *Planktothrix agardhii* (LMACYA 257) induced inhibition zones ≥ 10 mm, demonstrating their antibacterial activity against *L. pneumophila*. These results encourage us to further investigate the potentiality of cyanobacteria as natural sources of antibiotics and/or water disinfectants, to overcome the occurrence of pathogenic *Legionella* in water environments.

Keywords: antimicrobials; *Legionella*; cyanobacterial extracts; natural compounds; freshwater cyanobacteria

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