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P175: In vitro inhibitory activity of extracts of Brazilian Cyanobacteria against Herpes simplex viruses**Luciana R. Carvalho¹, Rebeca M. Oliveira², Gabriela S. Mendes², Geanne A. Conserva¹, Célia L. Sant' Anna¹, and Maria Teresa V. Romanos²**¹Núcleo de Pesquisa em Ficologia, Instituto de Botânica, São Paulo, Brazil; ²Laboratório Experimental de Drogas Antivirais e Citotóxicas, Instituto de Microbiologia Paulo de Góes, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil

Herpes simplex viruses (HSV) infections are among the most common diseases throughout the world, and it has been estimated that 60 - 95% of the adult population are infected with them. Generally, HSV-1 has been associated with oro-labial disease, with most infections occurring during childhood, and HSV-2, with genital infections acquired during sexual contacts. The incidence and severity of HSV-related pathologies have increased recently, mainly among patients with reduced cellular immunity, as in bone marrow transplant recipients and in bearers of acquired immunodeficiency syndrome (AIDS). These patients are treated with long-term antiviral therapy, which can lead to the selection of resistant variants. Thus, new anti-HSV drugs are urgently needed. Cyanobacteria are prolific producers of highly bioactive compounds, some of them displaying interesting antiviral activities[1]. Cyanovirin-N is a protein synthesized by *Nostoc ellipsoforum*, which, besides inhibiting HIV and influenza virus, it blocks HSV-1 entry into cells and prevents membrane fusion mediated by HSV glycoproteins; three *Microcystis* species showed remarkable activity against influenza virus and, estuarine cyanobacterial extracts are active against HSV-1[2]. In this work, acetic acid 0.1 M extracts of the cyanobacterial species *Lingbya* sp. CCIBt 862, *Phormidium* sp. CCIBt 1018, *Nostoc* sp. CCIBt 1028 and *Geitlerinema unigranulatum* CCIBt 971 were evaluated against HSV-1 and HSV-2. Antiviral assays were performed on Vero cell cultures, in the presence of the cyanobacteria extracts at non-cytotoxic concentrations. *Lingbya* sp. extract showed potent inhibitory activity against HSV-1 (94.4%) with $ED_{50} = 108 \mu\text{g/mL}$ and no action against HSV-2. With regard to activity against HSV-1, *Phormidium* sp. caused 96% inhibition with $ED_{50} = 383 \mu\text{g/mL}$; *Nostoc* sp., 94.4% with $ED_{50} = 39 \mu\text{g/mL}$, and *G. unigranulatum*, 60.2% with $ED_{50} = 57 \mu\text{g/mL}$. In relation to HSV-2, *Phormidium* sp. showed 99.7% inhibition, with $ED_{50} = 43 \mu\text{g/mL}$; *Nostoc* sp. 96.4% with $ED_{50} = 48 \mu\text{g/mL}$ and *G. unigranulatum*, 87.9% with $ED_{50} = 49 \mu\text{g/mL}$. Our results are in agreement with the ones displayed in literature about the cyanobacterial extracts (compounds) inhibitory activity against HSV and indicate that three of the four studied cyanobacterial extracts have potential to provide novel drug candidates. Bioactive compounds identification studies will be performed in order to elucidate their structures and mechanism of action.

[1].Sheng Xiong *et al.*, 2010. Appl. Microbiol. Biotechnol. 86(3): 805-812; [2].Viviana R. Lopes *et al.*, 2011. Toxicol In Vitro 25(4):944-950**P176: Citotoxicity of marine cyanobacteria from the portuguese coast against breast cancer cells****Margarida Costa¹; Pedro Leão¹; Maria João Ribeiro^{1,2,3}; João Costa-Rodrigues⁴; Mónica Garcia⁴; Piedade Barros³, Helena Fernandes⁴; Vítor Vasconcelos^{1,5}; Rosário Martins^{1,3}**¹CIIMAR, University of Porto, 4050-123 Porto, Portugal; ²Superior School of Health Technology of Porto, Polytechnic Institute of Porto, 4400-330 Vila Nova de Gaia, Portugal; ³University of Aveiro, 3810-193 Aveiro, Portugal; ⁴Faculty of Dental Medicine, University of Porto, 4200-393 Porto, Portugal; ⁵Faculty of Sciences, University of Porto 4169-007 Porto, Portugal

The marine environment possesses an unmeasured chemical and biological diversity, being considered an extraordinary resource for the discovery of new therapeutic drugs. Between others, marine cyanobacteria have emerged as a prominent source of bioactive secondary metabolites with a promising anticancer potential, as the described and intensively studied dolastatins. These compounds have been mainly isolated from the genera *Lingbya*, *Microcoleus* and *Symploca*, which grow at high densities in tropical and subtropical regions. Others, such as *Cyanobium*, *Synechocystis*, *Synechococcus*, *Leptolyngbya* and *Pseudoanabaena*, contribute only with a few described natural products. These last genera represent a large fraction of the marine cyanobacteria culture collection, maintained in the Laboratory of Ecotoxicology Genomics and Evolution at CIIMAR, Porto, Portugal. In order to evaluate the breast anticancer potential of strains belonging to these unexplored genera, we have been performing a cytotoxicity screening using human breast cancer cells. The assays are performed using a crude extract, obtained with a dichloromethane: methanol extraction (2:1), and three more extracts, obtained by a crude extract fractionation in a Si column chromatography. The cytotoxicity is evaluated by a MTT assay at 24, 48 and 72 hours and confirmed using a LDH assay. The results show that, inside of a group of 28 selected cyanobacteria strains, 5 can be detached as producers of cancer cells growth inhibitors. The present study has allowed us to shortlist strains for chemical exploration of their anticancer constituents.