10th Brazilian Conference on Natural Products
XXXVI RESEM
4-7 November 2025, Belo Horizonte, MG, Brazil

Section: 03

CYTOTOXIC THIAZOLE-PRODUCING Myxococcus sp. BRX-014 ISOLATED FROM A BRAZILIAN MANGROVE

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Myxobacteria are recognized as prolific producers of structurally diverse and biologically active metabolites. Although predominantly studied from terrestrial soils, their occurrence in coastal ecosystems such as mangroves remains largely underexplored. This gap is particularly evident in Brazil, where studies on myxobacterial diversity and biotechnological potential are still scarce. In this context, the present study investigates the potential of strain BRX-014, isolated from the Portinho Mangrove in São Paulo, Brazil. Phylogenetic analysis based on 16S rDNA sequencing identified the strain as a member of the genus *Myxococcus*, forming a distinct clade that suggests a potentially novel lineage. Its organic extracts demonstrated potent and selective cytotoxicity against human fibrosarcoma (HT-1080) and colorectal carcinoma (HCT-116) cell lines. Bioassay-guided fractionation afforded a dichloromethane fraction with pronounced bioactivity, displaying potent cytotoxicity (IC_{50} = 0.58 µg/mL) and strong antiplasmodial activity against *Plasmodium falciparum* 3D7 (IC_{50} = 0.9 µg/mL). Metabolomic analysis of the BRX-014 extract (HRMS/GNPS) revealed a large cluster of ions annotated as myxothiazol correlates, suggesting the presence of novel thiazole-related metabolites. Fractions enriched in these ions were purified by HPLC and will be subjected to further structural elucidation. The detection of ions consistent with myxothiazol derivatives provides a plausible mechanistic rationale for the observed bioactivities, given that myxothiazols are potent inhibitors of the mitochondrial cytochrome bc1 complex. This study highlights the unexplored potential of myxobacteria for the discovery of novel bioactive molecules, while also underscoring the importance of Brazilian mangroves as reservoirs of distinctive microbial diversity.

Keywords: *Myxobacteria; Myxothiazol; Marine natural products; Anticancer; Antimalaria*