Littoral lichen microflora: a promising source of antimicrobial compounds

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Résumé

Antimicrobial resistance (AMR) will become a health emergency by 2050 according to the World Health Organization. AMR is observed as well in human, animal, and plant pathogens. One of the many strategies to fight AMR is the search for new chemical structures that inhibit pathogens in understudied ecological niches.
Although recognized as a third partner in the symbiosis for thirty years, the lichen microflora remains promising as a source of new active specialized metabolites. Also, marine and coastal organisms, such as lichens, are subjected to different abiotic and biotic stress than their terrestrial counterparts that could lead to original chemical structures (Lauritano et Ianora).

300 bacterial strains were isolated from several coastal and terrestrial samples of *Rhizocarpon geographicum and* were screened for their antimicrobial activity. In the context of global health, we targeted two phytopathogens, *Erwinia amylovora* and *Venturia inaequalis*, and three human pathogens, *Pseudomonas aeruginosa*, *Escherichia coli* and *Staphylococcus aureus*.
One of the active strains isolated from a coastal sample of *R. geographicum*, collected near Crozon and identified as *Pseudarthrobacter sp.* demonstrated activity against our target pathogens, between 22 and 40% of growth inhibition and was therefore selected for further study using bioguided fractionation. The culture conditions and the metabolite production were optimized to cultivate this strain in a 5 L bioreactor. The results of the bioguided fractionation led to the isolation of potential active compound(s) and the associated molecular networks from LC-HR-MS/MS data will be discussed.

Mots-Clés: Lichen microflora, coastal bacteria, antimicrobial

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