

ANTIMICROBIAL ACTIVITY OF MARINE BACTERIA ASSOCIATED WITH SPONGE BSM1 FROM THE CORAL REEF OF BELO-SUR-MER IN THE SOUTH WEST OF MADAGASCAR

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Introduction

The oceans represent an enormous resource for the discovery of chemotherapeutic agents. The striking structural similarities of numerous natural products from invertebrates to metabolites of microbial origin suggest that microorganisms are the source of these metabolites. Among the marine invertebrates the sponge are potential source of unique bioactive metabolites. The present study was undertaken to assess this potential in symbiotic bacteria associated with the Madagascan sponge BSM1.

Material and method

The species BSM1 was collected from the coral reef off the coast of Belo-sur-mer in the South West of Madagascar at a depth of 10-15 m in December 2007, stored in sea water and transferred to CNRE where it was kept at -20°C.

Isolation and Purification

After the sterilization of surface of BSM1 in alcohol 70°, the tissues was cut into small fragments and put on nutrient agar with 2% NaCl and incubated at 25°C for eleven days. This was followed by the morphological and the microscopic characterizations of the colonies of bacteria isolates.

Culture and extraction

1ml of inoculums content 10^6 ufc/ml of germs was inoculated with 100 ml of nutrient broth and incubated at 25°C in dark during twelve days for secondary metabolite production. The secondary metabolites issued to the culture were extracted with two solvents (hexane and ethyl acetate).

TLC Bioautography

Hexane and ethyl acetate extracts were spotted to the TLC plates and eluted with appropriate solvent system. Afterwards, these plates were covered with layer of media inoculated with pathogenic strains *Staphylococcus aureus*, *Candida albicans*, *Escherichia coli* and *Pseudomonas aeruginosa*, incubated at 25°C for 24 hours. The TLC plates were sprayed with the aqueous solution of MTT. The corresponding inhibition zone appeared as clear zone surrounded by purple background of the living cells of germ.

Results and discussion

Twenty seven of coded bacterial strains were isolated and purified. They were of straight rod form with $0,5\mu\text{m} \leq l \leq 1,2\mu\text{m}$ and $0,9\mu\text{m} \leq L \leq 3,3\mu\text{m}$. The biochemical characterization was consistent with the preliminary conclusion that most of them belong to the genus *Bacillus*.

As regard with the antimicrobial activity, the hexane extracts of the isolates and ethyl acetate extracts of the isolates as well displayed wide variation in pattern against two pathogenic strains

S. aureus and *C. albicans*. The ethyl acetate extracts are found to be more active than those of hexane.

Conclusion and perspective

As a resume, twenty seven bacterial strains coded B101 to B132 associated with BSM1 sponge species were isolated. Reports regarding general studies on metabolites from Madagascan sponge species are very few. In particular, to the best of our knowledge, the present is the first work on marine bacterial strains. So, we think it is of high interest. The current chemical investigation on the secondary metabolites from BSM1 sponge and from the bacterial strain culture and the identification of the above strains using phylogenetic analysis will be continued.