

Interaction of Chemical, Microbiological and Ecological Aspects in the Brown Alga *Zonaria Tournefortii*

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Abstract : This study was carried out on the brown alga *Zonaria tourfortii* harvested on the central coast of Algeria. The chemical study enabled the characterization of phenolic compounds, mainly acyl phloroglucinol and chromone metabolites. The study isolated a significant quantity of all-cis-5,8,11,14,17 eicosapentanoic acid (EPA). Based on a literature review, we have proposed a biosynthetic pathway leading from EPA to phenolic metabolites. Bacterial screening from the algal surface led to isolate 30 bacterial strains, including 26 Gram+ containing the *Staphylococcus* and *Bacillus* genus, and 4 Gram- containing the *Acinetobacter* and *Enterobacteracea* genus. In terms of activity profiles, strain S13 (identified as *Bacillus amyloliquefaciens* based on 16S rRNA technique) proved highly interesting inhibitory activities against target germs, as well as its production of diffusible and volatile compounds. Bacterial cells from the *B. amyloliquefaciens* S13 strain were used to recover a volatile fraction. Analysis was carried out by gas chromatography-mass spectrometry. The main volatile compounds identified were: 13-epi-manoyl oxide (29.39%), manool (17.39%), 15,16-dinorlabd-8(20)-en-13-one (13.17%), labda-8(17),13Z-dien-15-ol (9.51%) and 3-acetoxy-13 epimanoyl oxide (5.26%) belonging to the labdane class of diterpenes, the latter having never been described in the category of microbial volatile organic compounds. Ecological aspects were discussed.

Keywords : chemical analysis, acylphloroglucinols, phenolic compounds, microbial volatiles, *Zonaria tournefortii*

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