

Exploratory investigation of geochemical properties of an antibacterial mineral-clay deposit on the central west coast of British Columbia, Canada

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Abstract:

The clay-like deposit on the central B.C. Pacific coast, Canada, has been preserved and is known that the First Nations have successfully used this material for therapeutic healing. This study explored the geochemical of the mineral deposition from five drilled core non-disturb profile samples to evaluate the uniformity and confirm the extent and quality of this clay deposit. The physical, chemical and mineralogical properties of core samples extracted at various depths and locations in relation to their antibacterial activities were determined and elucidate for its antibacterial mechanism of actions. Heterogeneity of antibacterial activities was observed with respect to location, depth, and multi-leaching processes of a surface sample. Samples within 1.22 m of the surface are generally acidic, with pH <5, whereas samples from depths >4.88 m generally have pH >8. Elemental, mineralogical compositions and antibacterial activities vary widely, without obvious correlations. Multi-leaching tests indicate a positive correlation between Br/Cl ratio and antibacterial activities.