

Antibacterial Activities of Ramalin, Usnic Acid and its Three Derivatives Isolated from the Antarctic Lichen *Ramalina terebrata*

Babita Paudel^{a,c}, Hari Datta Bhattarai^a, Hong Kum Lee^a, Hyuncheol Oh^b, Hyun Woung Shin^c, and Joung Han Yim^{a,*}

^a Polar BioCenter, Korea Polar Research Institute (KOPRI), Songdo Technopark, Songdo-dong 7-50, Yeonsu-gu, Incheon 406-840, South Korea.

Fax: +82-32-260-6301. E-mail: jhyim@kopri.re.kr

^b College of Medical and Life Sciences, Silla University, Busan 617-736, South Korea

^c Department of Marine Biotechnology, Soonchunhyang University, Asan 336-745, South Korea

* Author for correspondence and reprint requests

Z. Naturforsch. **65c**, 34–38 (2010); received October 5, 2009

The development of new antibacterial compounds is an urgent issue to meet the evolution of resistivity of pathogenic bacteria against the available drugs. The objective of this study was to investigate the antibacterial compounds from the Antarctic lichen species *Ramalina terebrata*. A total of five compounds, usnic acid, usimine A, usimine B, usimine C, and ramalin, were isolated by bioactivity guided-fractionation of the methanol extract of *R. terebrata* after several chromatographic procedures. The qualitative antibacterial activities of the crude extract and isolated compounds were determined by the disk diffusion method while the minimum inhibitory concentration (MIC) determination assay gave the quantitative strength of the test samples. All the test samples showed antibacterial activity against *Bacillus subtilis*. The crude extract and usnic acid showed antibacterial activity against *Staphylococcus aureus*. The MIC values of the isolated compounds against *B. subtilis* were in the range of 1 to 26 µg/mL. These observed experimental data showed the strong antibacterial potential of these compounds against *B. subtilis*.

Key words: Antimicrobial, Antarctic Lichen, *Ramalina terebrata*, Usnic Acid