

Screening of Antimicrobial Activity and Cytotoxic Effects of Two *Cladonia* Species

Birkan Açıkgöz^a, skender Karaltı^b, Melike Ersöz^c, Zeynep M. Co kun^c,
Gül ah Çobano lu^a, and Cenk Sesal^{a,*}

^a Marmara University, Science and Art Faculty, Department of Biology, Goztepe Campus, TR-34722, Istanbul, Turkey. E-mail: csesal@marmara.edu.tr

^b Yeditepe University, Faculty of Health Sciences, Nutrition and Dietetics Department, Ata ehir, Istanbul, Turkey

^c Istanbul Bilim University, Health Services Vocational School, Medical Laboratory Techniques Program, Esentepe, Istanbul, Turkey

* Author for correspondence and reprint requests

Z. Naturforsch. **68c**, 191–197 (2013); received April 25, 2012/May 20, 2013

The present study explores the antimicrobial activity and cytotoxic effects in culture assays of two fruticose soil lichens, *Cladonia rangiformis* Hoffm. and *Cladonia convoluta* (Lamkey) Cout., to contribute to possible pharmacological uses of lichens. *In vitro* antimicrobial activities of methanol and chloroform extracts against two Gram-negative bacteria (*Pseudomonas aeruginosa* and *Escherichia coli*), two Gram-positive bacteria (*Enterococcus faecalis* and *Staphylococcus aureus*), and the yeast *Candida albicans* were examined using the paper disc method and through determination of minimal inhibitory concentrations (MICs). The data showed the presence of antibiotic substances in the chloroform and the methanol extracts of the lichen species. The chloroform extracts exhibited more significant antimicrobial activity than the methanol extracts. However, a higher antifungal activity was noted in the methanol extract of *C. rangiformis*. The maximum antimicrobial activity was recorded for the chloroform extract of *C. convoluta* against *E. coli*. The cytotoxic effects of the lichen extracts on human breast cancer MCF-7 cells were evaluated by the trypan blue assay yielding IC₅₀ values of ca. 173 and 167 µg/ml for the extracts from *C. rangiformis* and *C. convoluta*, respectively.

Key words: Lichen, Antimicrobial Activity, MCF-7, *Cladonia*