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Chemical composition and antimicrobial activity of the essential oils of mosses (Tortula muralis Hedw., Homalothecium lutescens (Hedw.) H. Rob., Hypnum cupressiforme Hedw., and Pohlia nutans (Hedw.) Lindb.) from Turkey

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Abstract: The essential oils of mosses [Tortula muralis Hedw. (Pottiaceae), Homalothecium lutescens (Hedw.) H. Rob. (Brachytheciaceae), Hypnum cupressiforme Hedw. (Hypnaceae), and Pohlia nutans (Hedw.) Lindb. (Mniaceae)] were investigated by means of GC-FID/MS techniques. The major components were nonanal (18.3%) and tetradecanol (4.3%) in the oil of T. muralis, nonanal (36.8%) and tricosane (6.5%) in the oil of H. lutescens, nonanal (12.5%) and 2E-tetradecen-1-ol (6.9%) in the oil of H. cupressiforme, and nonanal (7.8%) and 2E-tetradecen-1-ol (7.1%) in the oil of P. nutans. The essential oils of T. muralis, H. lutescens, H. cupressiforme, and P. nutans were rich as in non-terpenoid components as aldehydes (26.9%, 50.9%, 15.6%, and 33.4%, respectively) and in terpenoid components as sesquiterpene hydrocarbons (6.7%, 11.0%, 12.7%, and 15.3%, respectively). The amounts and the numbers of terpenoids present in the investigated mosses are generally smaller than those in non-terpenoids. The isolated essential oils of T. muralis, H. lutescens, H. cupressiforme, and P. nutan were tested for antimicrobial activity against the bacteria Escherichia coli, Yersinia pseudotuberculosis, Pseudomonas aeruginosa, Staphylococcus aureus, Enterococcus faecalis, and Bacillus cereus, and the fungi Candida albicans and Saccharomyces cerevisiae at a maximum essential oil concentration of 27,000-65,000 μ g/mL in hexane, respectively, and they showed antimicrobial activity only against the fungi.

Key Words: Tortula muralis, Homalothecium lutescens, Hypnum cupressiforme, Pohlia nutans, essential oils, GC-FID, GC-MS, antifungal

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