Cytotoxic and allergenic sesquiterpene lactones from cushion bush (Leucophyta brownii Cass.)

Gade Hyldgaard, Mette; Purup, Stig; Paulsen, Evy; Andersen, Klaus Ejner; Andersen, Flemming; Fretté, Xavier; Christensen, Lars Porskjær

Publication date:
2017

Document version:
Final published version

Citation for published version (APA):

Go to publication entry in University of Southern Denmark's Research Portal

Terms of use
This work is brought to you by the University of Southern Denmark. Unless otherwise specified it has been shared according to the terms for self-archiving. If no other license is stated, these terms apply:

- You may download this work for personal use only.
- You may not further distribute the material or use it for any profit-making activity or commercial gain.
- You may freely distribute the URL identifying this open access version.

If you believe that this document breaches copyright please contact us providing details and we will investigate your claim. Please direct all enquiries to puresupport@bib.sdu.dk

Download date: 25. Jul. 2024
Cytotoxic and allergenic sesquiterpene lactones from cushion bush (*Leucophyta brownii* Cass.)

Hyldgaard MG, Purup S, Paulsen E, Andersen KE, Andersen F, Fretté F, Christensen LP

1Department of Chemical Engineering, Biotechnology and Environmental Technology, University of Southern Denmark, DK-5230 Odense M, Denmark, 2Department of Animal Science, Aarhus University, DK-8830 Tjele, Denmark, 3Department of Dermatology and Allergy Centre, Odense University Hospital, University of Southern Denmark, 5000 Odense C, Denmark, 4Dermatological Investigations Scandinavia, Institute of Clinical Research and Odense University Hospital, University of Southern Denmark, 5000 Odense C, Denmark

Cushion bush (*Leucophyta brownii* Cass., Asteraceae) has become a popular pot and outdoor container plant in some Nordic countries. Several cases of allergic contact dermatitis caused by cushion bush have been reported [1, 2]. Cushion bush is rich in sesquiterpene lactones containing an α,β-unsaturated γ-lactone moiety that are known for their anti-inflammatory and cytotoxic activity due to reactions with sulfhydryl groups of functional proteins via a Michael-type reaction. This also makes this type of sesquiterpene lactones potential allergenic [1, 3]. Seven sesquiterpene lactones (1–7) containing an α,β-unsaturated γ-lactone moiety were isolated from cushion bush and identified by LC-MS and 1D and 2D NMR spectroscopy as described previously [3]. Compounds 1–7 were investigated for their cytotoxic activity towards human breast cancer (MCF-7) and colon cancer (HT-29) cells as well as their allergenicity. Compounds 2, 3, 5 and 6 reduced proliferation of HT-29 and MCF-7 cells with IC₅₀ values < 10 µM, whereas compounds 1, 4 and 7 showed less cytotoxicity with an IC₅₀ value of > 20 µM for both cell lines. Six of seven sesquiterpene lactones elicited positive reactions in 4 of 11 patients. The sesquiterpene lactones 3 and 5–7, were confirmed to be sensitizers, whereas leucophytalin A (4) and 4α-hydroxy-5αH,10αH-1,11(13)-guaidien-8β,12-olide (1) were shown to be allergenic for the first time. No clear correlation between the cytotoxic activity and allergenicity of the tested compounds could be established. However, the present investigation confirmed a connection between type IV allergenicity and cytotoxicity of sesquiterpene lactones containing an α,β-unsaturated γ-lactone moiety.