Phytogrowth-Inhibitory Lactones Derivatives of Glaucolide B

Luiz Cláudio de A. Barbosa a,*, Adílson V. Costa a, Dorila Piló-Veloso b, Joao Luiz C. Lopes c, Manuel G. Hernandez-Terrones d, Beatriz King-Diaz e, and Blas Lotina-Hennsene, *

a Departamento de Química, Universidade Federal de Viçosa, 36571-000, Viçosa – MG, Brazil. Fax: +3138993065. E-mail: lcab@ufv.br
b Departamento de Química, Universidade Federal de Minas Gerais, Belo Horizonte – MG, Brazil
c Faculdade de Ciências Farmaceuticas de Ribeirao Preto, USP, Sao Paulo – SP, Brazil
d Instituto de Química, Universidade Federal de Uberlandia, Uberlandia – MG, Brazil
e Departamento de Bioquímica, Facultad de Química, Universidad Nacional Autónoma de México, Ciudad Universitaria, México D. F. 04510, México. Fax: +5556225329. E-mail: blas@servidor.unam.mx

* Authors for correspondence and reprint requests

Z. Naturforsch. 59c, 803–810 (2004); received April 15/June 22, 2004

The sesquiterpene lactone glaucolide B (1), isolated from Vernonia fruticulosa (Asteraceae), was transformed into six lactones (2–7). The structures of the products were elucidated by spectroscopic analysis. A series of solutions of compounds 1–7, at 200 µm, were tested on the germination and on the root and shoot growth of the dicotyledons Physalis ixocarpa and Trifolium alexandrinum and of the monocotyledons Lolium multiflorum and Amaranthus hypochondriacus. Lactone 5 exhibited clear selectivity towards dicotyledonous species at 200 µm, with an average inhibition of 90% on the germination of P. ixocarpa. Lactones 1, 3 and 4 had a greater effect on root length of monocotyledonous species, inhibiting around 70% at 200 µm in L. multiflorum. It seems that the diol function is required in lactones 4–6 to increase the activity, the polarity in the molecule might be required to reach its target.

Key words: Sesquiterpene Lactones, Herbicidal Activity, Germination and Growth Inhibition