

PHYTOCHEMICAL INVESTIGATION OF *EUPHORBIA TRIGONA*

Reham Hammadi¹, Norbert Kúsz¹, László Papp², Judit Hohmann^{1,3}, Andrea Vasas¹

¹ Department of Pharmacognosy, University of Szeged, Eötvös u. 6, H-6720 Szeged, Hungary

² Botanical Garden, Eötvös Loránd University, Illés u. 25, H-1083 Budapest, Hungary

³ Interdisciplinary Centre of Natural Products, University of Szeged, Eötvös u. 6, H-6720 Szeged, Hungary

e-mail: reham.hammadi@pharmacognosy.hu

Introduction

Euphorbia is the largest genus in the family Euphorbiaceae, comprising more than 2 000 species worldwide. Detailed study of the profile of all secondary metabolites could contribute to taxonomic subdivision of this complex genus. The most important compounds of *Euphorbia* plants are diterpenes. Hitherto many secondary metabolites with specific types of diterpene skeletons in the genus have been found to possess a number of interesting biological activities, including antiproliferative, antiviral, ion-channel modulating, and multidrug resistance (MDR) reversing activities [1].

The present work deals with the phytochemical investigation of *Euphorbia trigona* Miller. *E. trigona* is a thorny succulent plant, which grows up to 6 m in height. It is indigenous to southwest tropical Africa where its latex is applied in severe cases of constipation or in case of an epileptic attack. The irritancy of the latex was proven in human experiment, and ingenol esters were reported [2].

Results and discussion

The fresh aerial parts of *E. trigona* has been chopped and percolated with methanol at room temperature. The crude methanol extract was concentrated, and then dissolved in 50% methanol. Thereafter, solvent-solvent partition was performed by using *n*-hexane, chloroform, ethyl acetate and butanol. Diterpenes were accumulated in the chloroformic phase. After multiple separation process, including TLC, vacuum liquid chromatography, preparative TLC, and HPLC, nine compounds were isolated from the chloroformic fraction. The structures of the components were determined by 1D and 2D NMR (¹H-¹H COSY, HSQC, and HMBC) and MS measurements, and comparing them with literature data. The isolated compounds proved to be diterpenes; five of them are ingol-, and four components are ingenol esters. They are tri- or tetra esters, substituted with acetyl, benzoyl, angeloyl and tigloyl groups. The compounds were isolated previously from other *Euphorbia* species, e.g. *E. nivulia* and *E. kamerunica* [3, 4].

Conclusion

With a combination of different chromatographic techniques, nine polyacylated diterpenes were isolated from the chloroformic phase of *E. trigona* methanol extract.

Acknowledgements

Support from the GINOP-2.3.2-15-2016-00012 is gratefully acknowledged.

References

- [1] A. Vasas, J. Hohmann, Chem. Rev. 114 (2014) 8579.
- [2] S.M. Worobec, T.A. Hickey, A.D. Kinghorn, D.D. Soejarto, D. West, Contact Dermatitis 7 (1981) 19.

- [3] V. Ravikanth, V.L. Niranjana Reddy, T. Prabhakar Rao, P.V. Diwan, S. Ramakrishna, Y. Venkateswarlu, *Phytochemistry* 59 (2002) 331.
- [4] K. Abo, F.J. Evans, *Planta Med.* 43 (1981) 392.