Available online at www.sciencedirect.com
SCIENCE DIRECT
ELSEVIER
Biochemical Systematics and Ecology 33 (2005) 799–807
biochemical systematics and ecology
www.elsevier.com/locate/biochemsyseco

# Alkaloids of *Antizoma miersiana* (Menispermaceae)

Helene de Wet [a,1], Fanie R. van Heerden [b], Ben-Erik van Wyk [a,*]

[a] *Department of Botany, Rand Afrikaans University, P.O. Box 524, Auckland Park 2006, Johannesburg, South Africa*
[b] *Department of Chemistry and Biochemistry, Rand Afrikaans University, P.O. Box 524, Auckland Park 2006, Johannesburg, South Africa*

Received 14 April 2004; accepted 24 December 2004

**Abstract**

The main alkaloids of *Antizoma miersiana* and one of two species of the southern African endemic genus *Antizoma* (Menispermaceae), have been studied for the first time. Eight isoquinoline alkaloids could be positively identified (structural type in brackets): crotsparine (proaporphine); bulbocapnine and dicentrine (aporphine); cissacapine, cycleaneonine, cycleanine, insulanoline and insularine (bisbenzyltetrahydroisoquinoline). Crotsparine and bulbocapnine were the main alkaloids in the leaves, while bulbocapnine, dicentrine, insulanoline and an unidentified alkaloid are the major compounds in stems. The rhizome contains small amounts of all except crotsparine. There are clear differences, not only between various plant parts, but also between the two species of *Antizoma*. Bulbocapnine, for example, was previously found to be absent from the leaves and stems of *Antizoma angustifolia*. Dicentrine is absent from the latter and therefore appears to be of further diagnostic value to

* Corresponding author. Tel.: +27 11 489 2412; fax: +27 11 489 2411.
*E-mail address:* bevw@rau.ac.za (B.-E. van Wyk).
[1] Present address: Department of Botany, University of Zululand, P/Bag X1001, Kwa-Dlangezwa 3880, South Africa.

0305-1978/$ - see front matter © 2005 Elsevier Ltd. All rights reserved.
doi:10.1016/j.bse.2004.12.014

distinguish between the two species. The rich variety and yield of alkaloids in *A. miersiana* provide a rationale for its value as a medicinal plant.
© 2005 Elsevier Ltd. All rights reserved.

*Keywords:* Menispermaceae; *Antizoma miersiana*; *A. angustifolia*; Isoquinoline alkaloids; chemotaxonomy; Southern Africa

## 1. Introduction

*Antizoma* Miers is the only southern African endemic genus of the Menispermaceae. This large tropical and subtropical family comprises some 75 genera and 520 species (Watson and Dallwitz, 1992) and is of considerable medicinal interest. The biological activities are ascribed to a rich diversity of isoquinoline alkaloids. *Antizoma* comprises two species, *Antizoma angustifolia* (Burch.) Miers ex Harv. and *Antizoma miersiana* Harv. In a previous publication, the results of a study of the alkaloids of *A. angustifolia* (presence of seven identified and four unidentified alkaloids) were presented. In this paper, we report on the alkaloids of the second species, *A. miersiana*, as part of a chemotaxonomic and ethnopharmacological evaluation. The aim was to identify the main alkaloids in *A. miersiana* and to compare them with the alkaloids of *A. angustifolia* (De Wet et al., 2004a).

*A. miersiana* is a woody shrub of up to 1.5 m in height that is found in dry places in Namibia and the western parts of South Africa. In contrast to *A. angustifolia*, which has numerous medicinal uses in southern Africa (Watt and Breyer-Brandwijk, 1962; Von Koenen, 2001), there is only a single reference to a medicinal use for *A. miersiana* (Archer, 1994). In Namaqualand, the boiled root is drunk to treat stomach ulcers. No published information could be found on the alkaloids of *A. miersiana*.

## 2. Material and methods

### 2.1. General experimental procedures

NMR spectra ($^{1}H$ and $^{13}C$) were recorded on either a Varian Gemini 300 MHz or a Varian Inova 300 MHz spectrometer in $CDCl_3$ using TMS as internal standard. Apart from $^{1}H$ and $^{13}C$, COSY, NOESY, DEPT, HMQC and HMBC experiments were performed to elucidate the structures of compounds. EI-MS were recorded on a Shimadzu GCMS QP2010 apparatus. Optical rotations were measured on a JASCO DIP 370 digital polarimeter. Column chromatography was performed using silica gel 60 (230–400 mesh) using cyclohexane:chloroform:diethylamine (50:40:10) as the eluent. Analytical thin-layer chromatography of compounds or extracts was performed on Silica Gel 60 $F_{245}$, Merck plates, using the same eluent system as for column chromatography. HPLC analyses were performed on a Shimadzu 10A system with a binary gradient system and photodiode array detector.

Download English Version:

https://daneshyari.com/en/article/10582199

Download Persian Version:

https://daneshyari.com/article/10582199

Daneshyari.com