ChemClass Journal, 2004 (93-94)

Isolation of 3`H-cycloprop-(1,2)–5--cholest–1-en-3-one, 1`- carboethoxy–1`-cyano-1, 2--dihydro- derivative from *Cissus rufescens* (Guill and Perr)

I. G. Ndukwe
Chemistry Department, Ahmadu Bello University, Zaria.
(ndukweilogeorge@yahoo.com)

ABSTRACT

The aerial parts of *Cissus rufescens* afforded 3`H-cycloprop(1,2)–5-cholest–1-en-3-one, 1`-carboethoxy-1`-cyano-1,2-dihydro derivative from the petroleum spirit fraction. The substance was purely characterized by spectral methods.

INTRODUCTION

The aerial parts of *Cissus rufescens* (Ampelidaceae) were collected from natural habitat around the Faculty of Agriculture, Ahmadu Bello University, Zaria, Nigeria in June, 2002. Local botanists identified the plant materials partly in accordance to [1] and the voucher specimen number 900302 was deposited at the Herbarium of the Biological Sciences Department, Faculty of Science, Ahmadu Bello University, Zaria, Nigeria.
The plant is used locally in the treatment of syphilis, gonorrhea and general bacterial infections. There is no record of any compounds isolated from this plant.

MATERIALS AND METHODS

Extraction

Dried and ground plant material (148.60g) was successively and exhaustively extracted using a Soxhlet extractor with light petroleum spirit and methanol. Each extract was concentrated *in vacuo* to dryness at 40^0C yielding 4.21 g and 2.76g respectively. Antimicrobial screening of these extracts using the disc diffusion method [2-4] led to a further investigation of the petroleum spirit extract. The crude petroleum spirit extract was chromatographed on a silica gel column and eluted with a 6:1 petroleum spirit/chloroform mixture. The substance obtained was further purified using a PTLC plate of silica gel to obtain a yellow crystalline substance of melting point 60^0C-62^0C. The GC-MS of the substance was carried out and the spectra were compared with similar ones in the spectral data library for identification.

RESULTS AND DISCUSSION

The light petroleum spirit extract showed strong inhibition against *Staph epidermides, Staph aureu*s and *Candida albicans* but not on *Pseudomonas* species, *E.coli*, *Samonella typhi*, *Bacillus aureus* and *Klebsiella aeruginosa*. Inhibition zones of 30mm, 20mm and 25mm were observed for S*taph epidermides, Candida albicans* and S*taph aureus* respectively at $10^{-1}\mu$ concentration. This prompted further purification of this extract from which pure white crystals were isolated. The crystals were characterized and identified by comparative GC-MS analyses [5-8]. The GC of the substance has several peaks while the MS has a base peak at m/z 467. The prominent peaks in the MS are m/z 97, 149, 245, 283, 339, 367, 395, 502 and 526 and the molecular ion in this mass spectrum is the peak at m/z 526. A comparative study of the MS of this substance and that of similar samples in the GC-MS library shows that both samples have peaks coincident at (339-340), 367, 410 and 467. It is also observed that this substance compares with cholestenone in the molecular mass range of m/z 20 to 499. It follows that the molecular mass of the new substance, which is m/z 542, differs from the cholestenone by only two methylene groups. Indeed other two substances Lauric acid, 2 – (hexadecyloxy) – 3- (octadecyloxy) propylester of molecular mass 750 and Acetic acid, 3-(benzythio)-5, 10, 13-trimethyl –4- oxo-4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 – tetradecahydro – 1H – cyclopenta [a] phenanthrene derivative with molecular mass 466 were considered as possible alternatives but the differences in the molecular masses of these two spectra and that of the isolated substance disapprove them as possible analogues. Again the Lauric acid mass spectrum compares with the substance at m/z 26-553 while the

© ChemClass (CSN)

cyclopenta [a] phenanthrene derivative compares with it between m/z 27 – 470. From the above comparative analyses, the isolated substance is a cholestenone derivative and needs to be explored for medicinal applications.

ACKNOWLEDGEMENT

The author is very grateful to the authorities of Ahmadu Bello University, Zaria, Nigeria for funding this research.

REFERENCES

1 H. Dupriezm, P. De Leener, and Jardins et vergers P. (1987). *d'Afrique, Apica*, Enda, CTA, Wageningen: Collection Terres et Vie.

2 J.C. Ericsson and Sherris, J.C. (1971). *Acta Microbiol. Scand*. Section B suppl., 217.

3 A.L. Barry, F. Gracia and L.D. Thrupp (1975). *Amer. J. Clin. Path*., **53**, 149.

4 D. Felmighan and E.J. Stokes (1972). *Med. Lab. Technol*., **29**, 198.

5 A. El-Shazly, T. Sarg, L. Nitte and M. Wink (1996). *Phytochemistry*, **42**(4), 1217-1221.

6 A. El-Shazly (2002). Zeits *chrift Fur. Natur forschurg*, Tubingen **57**c,429-433.

7 L.W. Smith and C.J. Culvenor (1981). *Journal of Natural Products*, **44** (2), 129-152.

8 K. Borstel, L. Witte and T. Hartmann (1989). *Phytochemistry*, **28**, 1635-1638.

© ChemClass (CSN)