SHORT COMMUNICATION

Analgesic and Antiinflammatory Activities of Vernonioside B2 from Vernonia condensata

A. L. Valverde,1 G. L. C. Cardoso,2 N. A. Pereira,2 A. J. R. Silva1 and R. M. Kuster1*

1NPPN, Universidade Federal do Rio de Janeiro, CCS, Bloco H, Ilha do Fundão, Rio de Janeiro, Brazil, CEP 21941-590
2Departamento de Farmacologia Básica e Clínica, Universidade Federal do Rio de Janeiro, CCS, Bloco J, Ilha do Fundão, Brazil, CEP 21941-590

Vernonioside B2 isolated from the methanol extract of the Brazilian herb Vernonia condensata Baker was evaluated in vivo for analgesic and antiinflammatory activities. The compound reduced writhings (93.28%) and Evans blue dye diffusion (91.80%) induced by acetic acid (0.1 N) in a dose-dependent manner. Copyright © 2001 John Wiley & Sons, Ltd.

Keywords: Vernonia condensata; Asteraceae; vernonioside; stigmastane; analgesic activity; antiinflammatory activity.

INTRODUCTION

Vernonia condensata Baker (Asteraceae) is a bush widely distributed in Brazil. Evidence from Brazilian folk medicine has shown that the crude extract from the leaves of this plant is able to prevent stomach and liver disturbances (Magalhães et al., 1990). Recent pharmacological study proved that a polar extract from the leaves of V. condensata presented analgesic and anti-ulcerogenic activities (Frutuoso et al., 1994). Only few reports on phytochemical studies about this species have been published, some triterpenes (Bohlmann et al., 1981) and sesquiterpene lactones (Jakupovic et al., 1987) having been isolated. In the present communication we report for the first time the isolation of a steroidal glucoside in this species (vernonioside B2), isolated previously from V. amygdalina (Jisaka et al., 1993); and its analgesic and antiinflammatory activities.

MATERIAL AND METHODS

Plant material. The plant was collected in 1987 in the state of Pará, Brazil and identified by Dr Rubens Rodrigues Lima. A voucher specimen (n. 123.676) has been deposited at Museu Paraense Emílio Goeldi, Belém, Pará, Brazil.

Extraction and isolation. Dried leaves (700 g) of V. condensata were extracted with MeOH (3 × 2 L). The combined extract was concentrated in vacuo to give 80.1 g of residue. This residue was suspended in water and partitioned successively with n-hexane, chloroform, ethyl acetate and n-butanol. Removal of solvent from the ethyl acetate fraction yielded a residue (5.7 g) which was chromatographed on a Sephadex LH-20 column (200 g) with MeOH as eluent. The fractions collected (8 mL each) were monitored by TLC using methanol/chloroform/water (65:35:10) as eluent. Fractions 9–14 (2.0 g) from Sephadex were chromatographed over silica gel (300 g) column eluting with MeOH/H2O/CHCl3 (80:20:10). About 150 fractions (8 mL each) were collected. Fractions 46–58 (138.0 mg) were purified by recrystallization from CHCl3/MeOH (1:1) to give compound 1 (60 mg), identified as vernonioside B2 (Jisaka et al., 1993).

Animals. Male albino mice (20 g) were used throughout all experiments. The animals were kept at room temperature, with food and water ad libitum.

Analgesic and antiinflammatory activities. The procedure suggested by Whittle (1962) has been followed. The observation of pain writhings as well as capillary permeability were determined by the diffusion of dye (Evans blue) into the peritoneal cavity. Writhings were induced by acetic acid (0.1 N). Compound 1 was administered orally (25, 50 and 100 mg/kg) 1 h before the start of the experiment. Each group (5 animals) received 0.2 mL of a 1% solution of Evans blue via the tail vein 10 min before receiving an intraperitoneal injection of 0.1 mL/10 g of 0.1 N acetic acid. The writhings produced were counted for a period of 30 min. Forty minutes after injection of the dye the
animals were killed by ether inhalation, the peritoneal cavity was opened through a longitudinal incision and irrigated with 10 mL of distilled water collected in a Petri dish. The solution thus obtained was filtered through cotton wool into a flask containing 0.1 mL of 0.1 N NaOH and the volume was completed to 10 mL. The concentration of Evans blue was determined spectrophotometrically at 590 nm and compared with a standard curve. The amount of Evans blue in the peritoneal cavity was expressed as µg/10mL. Dye diffusion and analgesic activity were expressed as per cent reduction compared with control values.

Statistics. The statistical evaluation of results was done using unpaired Student’s t-test.

RESULTS

Preliminary characterization

The 1H-NMR and 13C-NMR including 1D and 2D techniques data are in agreement with vernoniaiside B2 isolated from V. amygdalina (Jisaka et al., 1993). The spectra can be obtained from the author by correspondence.

Analgesic and antiinflammatory activities

Both compound 1 (25, 50 and 100 mg/kg) and indomethacin (2 and 5 mg/kg) significantly (p ≤ 0.05) reduced the number of the writhings as well as the dye diffusion, compared with the control animals (Table 1).

DISCUSSION

The present study establishes the analgesic and antiinflammatory potential of compound 1 (vernomioside B2) isolated for the first time from V. condensata Baker. Compound 1 was able to reduce writhings and dye diffusion induced by acetic acid (0.1 N), although with a lower activity compared with indomethacin. In doses ranging from 25 to 100 mg/kg the effect was dose-dependent. Antiinflammatory activity has already been verified in some stigmastane-type sterols (Gupta et al., 1980; Kimura et al., 1995; Tsai et al., 2000). The results suggest that vernoniaiside B2 may be one of the active principles of the polar crude extract from the leaves of V. condensata responsible for analgesic activity. Further phytochemical and pharmacological investigations of this plant are in progress.

Acknowledgements

The authors are grateful to Ms Luciane Lobo Martins and the grants from CAPES, FAPERJ.

REFERENCES


