Effect of methanolic leaf extract of *Cissampelos mucronata* A. Rich against indomethacin induced ulcer in rats

S V Nwafor* & P A Akah

Department of Pharmacology and Toxicology, Faculty of Pharmaceutical Sciences, University of Nigeria, Nsukka, Enugu State, Nigeria

Received 7 September 2001; revised 9 December 2002

Five fractions (F₁–F₅) isolated from the methanolic leaf extract of *Cissampelos mucronata* A. Rich were investigated for antiulcer activity. At the dose of 450 mg/kg, they showed varying degree of protection against ulcer induced by indomethacin; the order of protection being F₁>F₂>F₃>F₄>F₅. The antiulcer potency of F₁ and F₂ is comparable with that of cimetidine (100 mg/kg, ip). Inhibition of gastric mucosal damage may partly contribute to the antiulcer activity of the fractions.

In Nigeria, the aqueous leaf extract of *Cissampelos mucronata* A Rich (Menispermaceae) is popular among traditional healers as an antidiarrhoeal and a palliative in stomachache. The description of the plant morphology has been documented. The antispasmodic and antiulcer activities of the leaf extract have been reported. The root and bark extract of *C. mucronata* and related species *C. pereira* and *C. owariensis* have been noted to be used locally as an anthelmintic, to relieve dysmenorrhoea, to prevent abortion and as a sedative. The last two properties are currently undergoing investigation in our laboratory.

As a result of the potent antiulcer property of the crude methanolic extract of the leaves of *C. mucronata*, we undertook this study to investigate the fractions of this extract for activity against indomethacin-induced ulcer.

Fresh leaves of *C. mucronata* were collected from Isuofia, Anambra State, Nigeria in December 1997. Mr. A. Ozioko of the Department of Botany, University of Nigeria, Nsukka, confirmed the botanical identity and voucher specimen has been deposited in the University Herbarium.

Extraction of air-dried and powdered plant material was carried out using methanol. The solvent system that gave the best resolution for chromatography was n-butanol: glacial acetic acid: water: hexane (4:1:1:2). The fractions, contained in silica gel powder, were extracted with methanol through repeated washing. The extracts were filtered and the solutions of the respective fractions concentrated with rotary evaporator under reduced pressure. The five fractions were correspondingly suspended in aqueous solution of 3% Tween 85 and appropriate concentrations used for pharmacological screenings.

The five fractions were tested for the presence of chemical constituents using the standard procedures.

Oral LD₅₀ of 8.5±0.35 g/kg in mice has been reported for the crude methanolic extract. Substances with LD₅₀ above 5 g/kg are generally regarded as safe; hence, the five fractions derived from the methanolic extract were regarded as such.

White Albino rats (110 – 180 g) of either sex bred in the Animal House of the Department of Pharmacology and Toxicology, University of Nigeria, Nsukka, were used for the study. They were kept in the Animal House for 7 days with free access to food (Pfizer PLC, Lagos) and water before the commencement of the experiment.

Antiulcer activity—The antiulcer activity of the five fractions was assessed using indomethacin-induced ulcers in experimental animals. Rats fasted for 18 hr prior to the beginning of the experiment were used. Thirty five rats were divided into seven groups of five animals per group. The first five groups received 450 mg/kg of the corresponding fractions while the last two groups received cimetidine (100 mg/kg) and 3% Tween 85 (5 ml/kg) respectively. Thirty minutes later, ulcers were induced with indomethacin (40 mg/kg). All the administrations were by intraperitoneal route. After 8 hr the animals were sacrificed and the stomach removed and opened along the greater curvature. The stomach was rinsed under a...
The influence of flavonoids on arachidonic acid metabolism, their vasoprotective action, and their ability to interfere with the formation of histamine in the gastric mucosa. Although F3 contains alkaloid, its inability to prevent ulcer induction relative to cimetidine could be explained because alkaloids are multivariate and not all show antiulcer activity.

Ulcer induction by indomethacin and related nonsteroidal anti-inflammatory drugs results from the inhibition of the synthesis of prostaglandins in which arachidonic acid is involved in the synthetic pathway. This leads to gastric mucosal damage. Hence, although there are multiple aetiological factors in ulcer pathogenesis, the activity of the fractions against indomethacin-induced ulcer may be attributed in part to cytoprotective mechanisms of action. Determination of the exact mode of action is the subject of our further research interest.

The authors are grateful to Mr. Goddy Mbonu, a traditional medicine healer in Isuofia, Aguata L.G.A., Anambra State, for introducing the plant to us.

References
11 Oliver B, Medicinal Plants in Nigeria, 1st edn (Nigerian College of Arts, Sciences and Technology, Ibadan) 1960, 17.