

Sapogenin from Leaves of *Amaranthus cruentus*

Nora ESCUDERO^{1*}, Sara MUCCIARELLI¹ and Pedro ROSSOMANDO²

¹ Area Bromatología y Control de Calidad,

² Química Orgánica. INTEQUI. CONICET, Facultad de Química, Bioquímica y Farmacia, Universidad Nacional de San Luis, Chacabuco y Pedernera, 5700 San Luis, Argentina

SUMMARY. The nutritional quality and haemolytic activity of *Amaranthus cruentus* leaves is well-known. Sapogenins present in these leaves were identified by the separation technique of Peñafiel and Díaz de Villar. After purification by silica gel column chromatography 0.47 g of oleanolic acid was obtained (yield: 22.3%). The structure of oleanolic acid was determined by the combination of IR, ¹H/¹³C NMR and MS spectroscopy. The glycone moiety (rhamnose) was identified by comparison (paper chromatography) with an authentic sample.

RESUMEN. "Sapogeninas de hojas de *Amaranthus cruentus*". Conocida la calidad nutricional de las hojas de *Amaranthus cruentus* y habiéndose detectado alta actividad hemolítica, se buscaron las sapogeninas presentes. La técnica de separación usada fue la de Peñafiel y Díaz de Villar, obteniéndose luego de purificación a través de cromatografía en columna de gel de sílice 0,47 g de ácido oleanólico (rendimiento: 22,3%). La estructura del aglicón se determinó mediante la combinación de espectroscopía IR, ¹H/¹³C NMR y MS. La glicona detectada por comparación con una muestra auténtica (cromatografía en papel) fue ramosa.

INTRODUCTION

Amaranthus cruentus is a plant of a well-known nutritional quality and its grain has intensively been studied. Its chemical composition, amino acid content and protein quality renders it useful for human feeding or as forage¹⁻⁴. The most widely used part of *A. Cruentus* is the seed, though the utilisation of leaves has been recently recommended as an alternative to spinach, cabbage and lettuce, among others.

Saponins have been implicated in reduced animal growth and performance⁵. Mostly, these substances are bitter, exhibit activity on the superficial tension and are highly haemolytic. These glycosides lack toxic effects for man, probably because they are not absorbed in the gastrointestinal tract and, besides, the occurrence of saponins do decrease the *Amaranthus* nutritional quality since they can be eliminated with the cooking water⁶.

KEY WORDS: *Amaranthus cruentus*, Oleanolic acid, Sapogenins.

PALABRAS CLAVE: Acido oleanólico, *Amaranthus cruentus*, Sapogeninas.

* Author to whom correspondence should be addressed.