URINARY EXCRETION EVALUATION OF *Aloe saponaria* METABOLITES

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INTRODUCTION
The 1,4-linked β-D-mannopyranosa and 1,4-linked α D-mannopyranosa are two partially acetylated mannan, isolated from the pulp of *Aloe saponaria* (i). They have been associated to many biological activities, including antiviral, anti-bacterial, anti-inflammatory and immunostimulatory (ii). It is known that the α and β polysaccharides can be catabolyzed to a lower molecular compounds (mannose or mannose oligosaccharides) by the human intestinal microflora (iii). Many Gram (-) bacteria have mannose-specific adherence due to the presence of lectins onto the bacterial surface, which bind to mannose residues (iv).

Studies of polymicrobial sepsis in mice showed that the i.v. administration of *Aloe vera* fresh gel markedly enhanced the urinary bacterial clearance (v).

The objective was to evaluate the urinary excretion of saccharides metabolites after *Aloe saponaria* fresh gel oral intake in volunteers to estimate its potential utility as a coadjutant in urine tract infections. For this purpose a systematic study of quantification and identification of total mannose present in urine was performed.

MATERIALS AND METHODS
The fresh gel contained in 250 g of *Aloe saponaria* leaves obtained from Calamuchita Valley, Cordoba, Argentina was orally administered after dinner to five volunteer during seven days. This study was evaluated by the Clinical Trial Commission of the Clinicals Hospital according to the Declaration of Helsinki. All volunteers gave their written informed consent prior to study inclusion. Urine samples were collected fasted at t=0 days (Mt₀) and t=7 days (Mt₇) and subjected to the determination of:

- Mannose through total carbohydrates by Dubois method (phenol/ sulfuric acid) (vi) with mannose reference.
- Glucose presence was discarded by the selective Enzymatic Method.

Additionally TLC Chromatography, ¹H NMR and HPLC were performed using urine Mt₀ and distilled water spiked with mannose as references.

RESULTS AND DISCUSSION
The carbohydrate total concentration determined in the urine samples was 622, 289, 480, 356 and 287 mg/l. No glucose was detected. Then these concentrations were inferred as mannose. The differences among volunteers were related to the variation in absorption and metabolism of the natural product in each individual.

In agreement TLC showed a unique spot at the same Rf (0.81) than mannose reference. Also HPLC chromatogram of Mt₀ samples showed a peak with retention time (14,91 min) matching mannose reference (14,84min). In addition, peaks overlapped at slightly higher retention times were observed. They may be due to mannose oligosaccharides present in the biological sample.

¹H NMR of Mt₀ spectra presented signals at δ: 3, 42 (s)-3.55(s)- 3.76, 3.77 (d)(CH OH) δ: 4,51 4,53(d) (C₁ α H), δ: 5.10 5.11(d) (C₁ β H) which are characteristic of carbohydrate. The signals are similar to that previously described for polysaccharides from *Aloe saponaria* (2).

CONCLUSIONS
The results showed a significant metabolism of the acetylated mannan and excretion of mono and/or oligosaccharides from *Aloe saponaria* fresh gel after oral administration. The TLC and HPLC chromatograms detected mannose in the analyzed biological material. In agreement ¹H NMR signals from carbohydrates are present. Further research is necessary to establish if concomitant intake of *Aloe saponaria* fresh gel would be useful as a coadjuvant for the treatment of patients with urinary tract infections.

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REFERENCES


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