

## Bezoar: "The guanaco stone"

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### INTRODUCTION

A study was carried out of the possible components and therapeutic effects of a native medicine that the local inhabitants knew as "guanaco stone" that was obtained by making an infusion prepared with a crushed stone. This infusion was used as an antidote in the case of insect and vermin bites, as a digestive, and other analgesic purposes in general. The bezoars known in our region as "guanaco stone" are compactions of various chemical substances, hairs, vegetable fibers and foreign bodies, which are formed mainly between the divisions of the stomach of the guanaco (Lama guanicoe). For many centuries in the culture of the European and Asian world it has been taken for granted that it serves as an antidote for some poisons and its old name comes from the Persian word "padzahr" which means "counterpoison". The study that was carried out consisted of a search for bibliographic information, interviews with residents of the region and school laboratory tests. In the school laboratory, the chemical composition of the "guanaco stone" and the explanation of the therapeutic action mechanism related to its chemical content were sought.

### BEZOARES

From very remote times, those who inhabited the Inca Empire attributed healing properties to the bezoar or gastric calculus that forms in the stomach of American camelids. Among the main properties, it was considered that it had the power of healing wounds, cures eye diseases and, pulverized, was ingested to relieve stomach pain. When Europeans arrived on the American continent and discovered bezoars produced by various species of local fauna, they also became interested in them due to the importance given to them by aboriginal communities. Regarding the curative capacities of the bezoars brought from the American continent to the old world, several authors highlight their absorbent and adsorbent properties and their capacities to neutralize acid substances, related to their chemical composition. It has been interchangeably called bezar, bezoar, bezaar, bezares.



### METHODOLOGY

Three types of determinations were made in the school laboratory:

- Determinations by macroscopic methods.

Observed: Texture, color, density, hardness, morphology, exfoliation (fracturing).

- Determinations by microscopic methods.

A transparent section of the bezoar allowed a detailed observation of the microstructure of the mineral content of the bezoar.

- Determinations by chemical methods.

- 0.5 g of bezoar powder was placed with 5 drops of 0.1 N hydrochloric acid. The procedure was also repeated using 0.1N sodium hydroxide.

- Additionally, 1 g of the bezoar powder was challenged with 2 mL of 20 vol. hydrogen peroxide.

- The Hanna Instruments Soil Test Kit was also used. This test provides a quick way to determine which basic chemical elements that have been ingested by guanacos (Lama guanicoe) are present in the bezoar. The presence of nitrogen (N), phosphorus (P), and potassium (K) in the bezoars was examined.

### OBJECTIVE

To study in vitro the possible composition of the mechanism of action of the "bezoar or stone of guanaco" that can explain its therapeutic action.

### RESULTS

- Macroscopic methods

- Color: Taupe.
- Weight: Specific weight 1.167 g/ml<sup>3</sup>.
- Hardness: does not break easily.

- Microscopy methods:

- Approximate grain size: 10 microns.
- Types of grains: amorphous.
- Under the microscope you can see a stippling of the mineral composition and also small mineralized plant remains.

- Chemical Methods.

- Upon confronting the bezoar powder with 0.1N hydrochloric acid, the powder completely dissolved.

- When confronting the bezoar powder with 0.1N sodium hydroxide, the powder remained at the bottom of the test tube.

- When facing the bezoar powder with hydrogen peroxide of 20 vol. the powder remained unchanged. pH is neutral.

- After the determinations made with the Hanna Instruments Soil Test Kit, it was obtained as a result that the levels of P, N, and K are medium.

### CONCLUSION

It is concluded in this first approach to the subject, that according to these determinations made, the bezoars may have acted by two mechanisms: due to their phosphate content, they could act as chelators of the toxic substances ingested, facilitating their elimination; but also because of the minerals they possess together, they stimulate the secretion of gastric acid and digestive enzymes.

ECMC  
2022

The 8th International Electronic  
Conference on Medicinal Chemistry  
01-30 NOVEMBER 2022 | ONLINE