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Comparative Pharmacobotanic Study of Argentinean Aristolochias

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INTRODUCTION

The Aristolochiaceae family comprises 7 genera and *ca*. 600 species of herbaceous, hemiwoody or woody plants, which grow as vines, and live in warm and template places all over the world. *Aristolochia* is a genus native to South America. In Argentina is represented by 21 species, among which *A. triangularis* Cham. and *A. macroura* Gómes grow in eastern and northeastern Argentina. Both are marketed and used in infusions due to their medicinal properties. Both are popularly known as 'mil hombres' ('thousand men'), 'patito' ('small duck'), 'buche de pavo' ('turkey craw'), 'liana de agua' ('water vine'), 'cipó', 'jarrinha', etc. There are reports on their popular uses. Domínguez (1928) attributed to these species diuretic, stimulant, emmenagogue, antifebrile, stomachic, antiseptic, vermifuge and antiophidian properties. Pío Correa (1931) reported them as toxic drugs, and pharmacological studies demonstrated the toxicity of some *Aristolochia* species, causing abortions and nephropaties. Mongelli *et al*. (2000) carried out studies with extracts of *A. triangularis*, showing to be cytotoxic against K13 cells, and Amat *et al*. (2002) reported it as antimytotic. Ahumada (1967) analysed the stems of Argentinean Aristolochias. However, few reports are known on pharmacobotanic studies about the vegetative organs marketed because of their therapeutic action. In this work a comparative study on stems of *A. triangularis* Cham. and *A. macroura* Gómes is shown, including macroscopic and microscopic morphodiagnosis, which allow morphologic, anatomic and micrographic recognition when a quality control of commercial samples of the plant drug is carried out.

METHODOLOGY

Commercial stem samples of *Aristolochia triangularis* Cham. and *Aristolochia macroura* Gómes were analysed. Dried samples were obtained from regional markets (Provinces of Jujuy, Tucumán and La Rioja, Argentina). The anatomical study was carried out by inclusion techniques in paraffin, and maceration. In both cases, material fragments were previously boiled for 4 hours in water and detergent. Cross sections of the included material were obtained with a slide microtome, then stained with safranine-fast green, and mounted in Canada Balsam. Macerates were made with the purpose of characterizing different constitutive cell types. Micrographic analysis was carried out by specific histochemical tests: tannins with ferric sulfate solution, lignine with phloroglucinol in a hydrochloric medium, fat with Sudan IV, starch with iodine solution (Lugol's solution), saponins with concentrated sulfuric acid, and oxalate crystals with cupric acetate.

Table 1. Macroscopic stem aspects

Species	*A. triangularis*	*A. macroura*
Ritidome	Developed	Scarce
	Persistent	Persistent
Fissures	Longitudinal	Longitudinal and transversal crannies
Colour	Brown-yellowish	Dark brown
Aspects	Spongy	Woody

RESULTS AND DISCUSSION

Results reveal the following morphoanatomic

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characters. In *A. triangularis* is macroscopically observed a well developed and wrinkled ritidome, which is separated in longitudinal strips, while the ritidome in *A. macroura* is low developed and is separated in longitudinal strips with traverse crannies (Table 1).

Table 2. Micrographic stem characters.

Species	***A. triangularis***	***A. macroura***
Suber	Lax	Compact
Suber cells	Thin walls	Thick walls
Parenchymatic cells	Thin walls, abundant starch.	Thick walls, abundant starch.
Parenchymatic conduc. cells	Thick walls	Thin walls
Vessels	Short, wide and reticulated	Short, wide, short with simple punctuations, and areolated in slanting position.
Scler. Cells	Large number. Thick wall.	Few, thick wall.
Secretory cells	Elyptic with yellow contents	Rounded with orange contents
Par. Cells	with tannin	with tannin
Fibers	Lignified walls with simple punct.	Lignified walls with simple punctuations.

CONCLUSIONS

These are contribution data of diagnostic value on morphological, anatomical and micrographic characters of the studied species, which can be used particularly for quality control, and identification of plants marketed either as entire or fragmented drug.
The anatomical structure of both species responds to an *Aristolochia*-type stem. In a cross section, a thick suberose layer is distinguished in *A. triangularis*, and a compact one in *A. macroura*, an amylipher cortical parenchyma and abundant secretory cells. The vascular system is represented by radial bundles that converge to the center with scarce medullary development, separated from the bark by a perivascular sheath of sclerenchymatic cells, the latter being more abundant in *A. triangularis*. The xyleme shows vessels of great diameter accompanied by fibers of narrow cell lumen, radial parenchyma of cells with abundant amyloplasts and lengthened secretory cells. In *A. macroura*, the perivascular sheath is low developed, the vessels are accompanied by a large number of sclerenchymatic fibers, radial parenchyma of cells with abundant amyloplasts and rounded secretory cells. As a result of the dissociation and the application of micrographic tests, the occurrence of different characteristic cell elements is determined for each species (Table 2).
The morphoanatomy and micrography of stems of these species allowed to identify them as *A. triangularis* and *A. macroura*, respectively, demonstrating that these are pure samples.

REFERENCES

Amat A. G., Yajia M. E., Gonzalez C. F., Lorca G. L., Sanchez Gonzalez F., Riglos A. G. and Veron J. R. (2002) Evaluation of cytological parameters induced by aqueous extracts of seven plants used as antihypertensive agents in argentine folk medicine. *Acta Farmaceutica Bonaerense* **21**: 37-42.

Ahumada Z. (1967) Revisión de las A*ristolochiaceae* argentinas. [Revision of the argentine Aristolochiaceae]. *Opera Lilloana* **16**: 1-145.

Domínguez J. A. (l928) *Contribuciones a la materia médica argentina*. [*Contributions to the argentine medical matter*]. Trabajos del Instituto de Botánica y Farmacología,
44: 1-433. Buenos Aires, Argentina.

Mongelli E., Pampuro S., Coussio J., Salomon H., Ciccia G. (2000) Cytotoxic and DNA interaction activities of extracts from medicinal plants used in Argentina. *Journal of Ethnopharmacology* **71** :145-151.

Pío Correa M. (1931) *Diccionário das plantas úteis do Brasil e das exóticas cultivadas*. [*Dictionary of useful plants from Brazil and cultured exotics*]. Imprensa Nacional, Rio de Janeiro, Brazil; Vol. 2, 408 pp.