

COMPARATIVE HISTOLOGIC STUDIES ON *Plantago major* L. AND *P. lanceolata* L. COLLECTED IN PATAGONIA AND IN BS. AIRES PROVINCE (ARGENTINA)

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Abstract

Histologic epidermical studies on *Plantago major* L. and *P. lanceolata* L. were performed to establish if hair density can show any variation according to the collection place of them. Both are European species, and keep their original hair patterns. Plants from Chubut (Patagonia, South Argentine) show differences in hair density when compared to specimens from the Province of Buenos Aires.

1. Introduction

Leaves of *Plantago major* L., species known in our country with the common name “llantén” (“plantain”) have been used for wound cicatrization for a long time. Besides, they are employed in folk medicine in the treatment of other affections, including tumor therapy.

For sale, leaves are usually cut into pieces with other parts of the plant. Sometimes, not only *P. major* leaves but also leaves and stems belonging to other species of the same genus, and known as “llantén” too, are found in commercial samples. Therefore, microscopic analysis of these samples becomes necessary in order to establish which species is being sold. Parameters to assure quality must be determined, and hairs provide a good starting point for control (Willuhn, 1989).

In this study, *P. major* and *P. lanceolata*, the second species used in our country with the same properties of *P. major*, are investigated to determine if hair pattern presents any variation when plants come from different places within the Argentine Republic.

2. Materials and methods

2.1. Plant material

Plants belonging to both species were collected in the Provinces Buenos Aires and Chubut (Patagonia, South Argentina).

Reference specimens are in the Museo de Farmacobotánica “Juan A. Domínguez”, Facultad de Farmacia y Bioquímica, Universidad Buenos Aires.

2.2. Methods

2.2.1. Leaves are disintegrated with 5% NaOH, during 5 min. at 100°C (WHO, 1991). This method is very quick, simple and efficient.

2.2.2. Clarification is done with chloral hydrate (5g /2 ml) by boiling until transparency (WHO, 1991).

3. Results

Hairs from both species are shown in Figure 1. Results of the microscopic analysis are presented in Table 1.

P. major and *P. lanceolata* are not native species. They come from Europe and Asia (Pontiroli, 1965). Hair types of argentine plants belonging to both species show the same pattern as in Europe.

Non-glandular hairs in *P. major* and *P. lanceolata* from Patagonia are more abundant than in specimens from Buenos Aires. In some plants of the latter, however, very few non-glandular hairs could be detected. When this is the case, the density of glandular hairs rises.

P. major from Patagonia showed a decreased density of glandular hairs. Density of glandular hairs in plants of *P. lanceolata* from Patagonia is similar to those from Province Buenos Aires.

4. Discussion

Hair pattern is a worthy characteristic when comparing *P. major* to *P. lanceolata*. Hair density is in this case not relevant. Hairs are different enough to recognize both species, since *P. lanceolata* hairs are very typical (see Figure 1).

However, other argentine species belonging to *Plantago* show hair patterns very similar to *P. major*. Thus, in these cases, hair types are not so consistent when trying to find a difference between them. Density could be of importance in this context, since *P. major* should be almost glabrous. However, as established in our survey, according to the collection place, the species can become hairy and so this feature loses importance when making a comparison.

5. Acknowledgements

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6. References

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 Willuhn G., 1989. Teedrogen, (Max Wichtl) Wissenschaftliche Verlagsgesellschaft GmbH, Stuttgart, 466-469.
 World Health Organization, Pharm. 92559 (1991): 15-17.

Table 1 - Distribution of hairs in *Plantago major* and *P. lanceolata*

	<i>P. major</i>	<i>P. major</i>	<i>P. lanceolata</i>	<i>P. lanceolata</i>
	Buenos Aires	Chubut	Buenos Aires	Chubut
Non-glandular hairs	3-5/cm ²	45-55/cm ²	10-20/cm ²	90-100/cm ²
Glandular Hairs	400-425/cm ²	135-155/cm ²	40-50/cm ²	30-50/cm ²

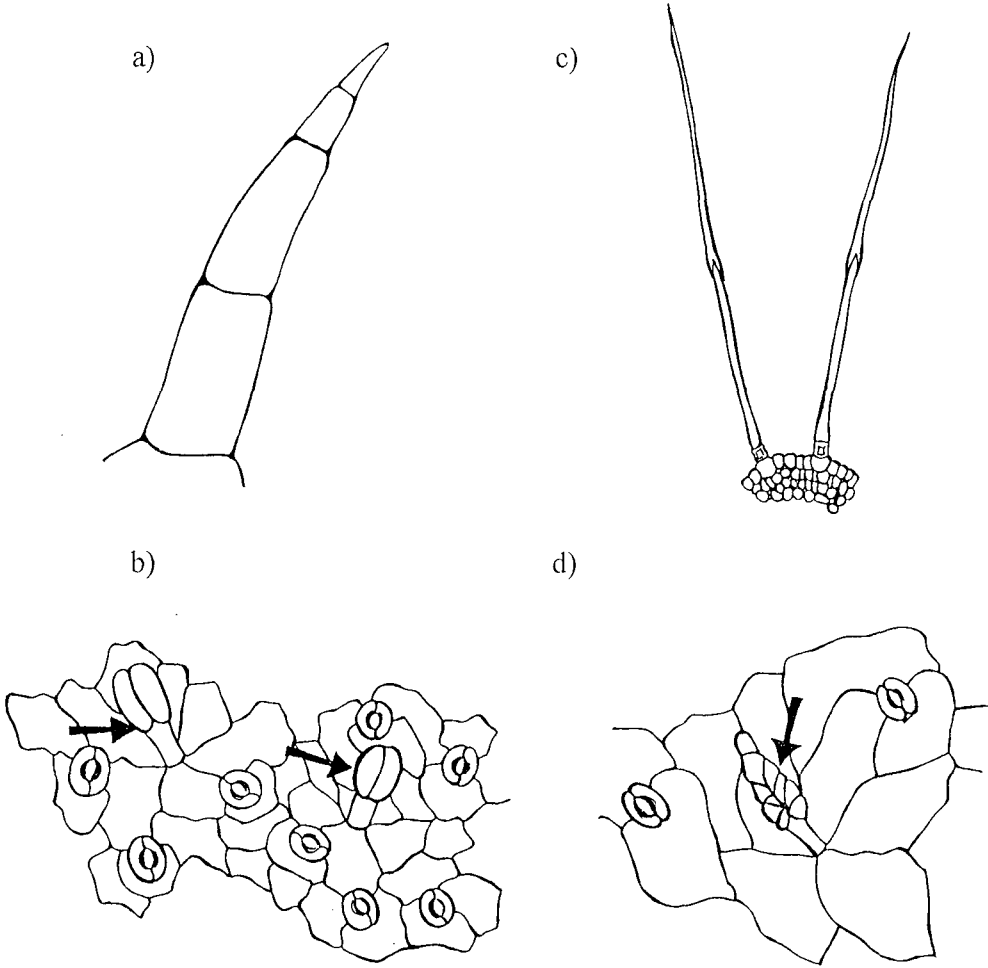


Figure 1 - Hairs from both species: *Plantago major* a): uniseriate non-glandular hair (400x); b): glandular hair with unicellular short stalk and head with two secretory cells (400x). *Plantago lanceolata* c): non-glandular knee-articulated hair (100x). d): glandular arrow-shaped hair (400x).