

SUMMARY

A study was made of the leaf anatomy of six species of Bromeliaceae found in an Amazonia campina. An attempt was made to correlate anatomical structure with the campina environment.

Six species were studied: *Aechmea mertensii* (Meyer) Schult., *Aechmea setigera* Mart. ex Schult., *Ananas ananassoides* (Baker) L. B. Smith, *Streptocalyx poeppigii* Beer, *Tillandsia adpressiflora* Mez e *Vriesea splitgerberi* (Mez) L. B. Smith & Pittendrigh.

Leaves from the rosette periphery were removed and histological sections were prepared of four regions of each leaf: base-middle, center-middle, marginal-middle and apical-middle.

The epidermis was dissociated from six regions of the leaves: base-middle, base-margin, center-middle, center-margin, apex-middle and apex-margin.

Scales were obtained by scraping the leaf surface in the same six regions used for the epidermal dissociations. Fresh sections were made to test for starch and for a better understanding of the structures.

Descriptions of the structures, photomicrographs and schematic drawings were made using the material thus obtained.

Also, the number of stomata and the scales were counted in the upper and lower epidermis.

In the six species studied, the epidermal structure was found to be typical of the Bromeliaceae: "Epidermal cells in surface view with markedly sinuous walls; inner wall much thicker than outer, each cell usually including a large silica-body" (Tomlinson, 1969).

The smallest cells were observed in *Ananas ananassoides* and *Streptocalyx poeppigii*. The other four species presented small epidermal cells only at the leaf base.

It can be said, based on the data obtained, that the number of scales within a single leaf seemed to influence the size of the cells within that leaf.

In general, the anticlinal walls of the cells were sinuous. This may be related to the amount of humidity. The thickness of the internal anticlinal and periclinal walls may be related to the temperature and light found in the campina.

The occurrence of silica-body was more or less constant. Silica-bodies were not observed regularly in the middle and apical regions of the leaves of *Vriesea splitgerberi* and *Aechmea setigera*.

Scales in rows were found throughout the leaf on the upper epidermis of *Ananas ananassoides* and *Streptocalyx poeppigii*, while in *Aechmea setigera*, *Aechmea mertensii* and *Vriesea splitgerberi* scales in rows were found in the middle and apical regions only. In *Tillandsia adpressiflora* scales were not arranged in rows on any part of the leaf.

The largest number of scales were found in the basal region for all species examined.

The structural specialization of scales was observed primarily in *Tillandsia adpressiflora* and *Vriesea splitgerberi*.

Ananas ananassoides, *Streptocalyx poeppigii*, *Aechmea setigera* and *Vriesea splitgerberi* had scales and stomata distributed in bands in the middle and apical region of the leaf. At the base the scales and stomata were found in rows. The stomata and scales in *Aechmea mertensii* were always in rows, while in *Tillandsia adpressiflora* their distribution was irregular.

In *Aechmea mertensii* and *Vriesea splitgerberi* were the stomata not covered by scale shields. In the other species, scales probably help to avoid water-loss through the stomata.

Projections of the lateral cells of the substomatic chamber occurred in such a way as to almost close it. In *Aechmea mertensii* these projections were completely sclerified.

The number of stomata increased from the base of the leaf to the apex. This was found to be true for all species studied.

The ratio of stomata number to number of scales was greatest in *Aechmea mertensii* while in *Tillandsia adpressiflora* it was the lowest. According to Tomlinson (1969) the ratio is greatest in terrestrial plants and least in epiphytes.

In *Aechmea mertensii* the stomata were not structurally and functionally related with scales, which may be because this species is an epiphyte and has a high ratio of stomata to scales.

In *Aechmea setigera*, *Ananas ananassoides* and *Streptocalyx poeppigii* it was observed that the superficial layers of cells were sclerified. In *Tillandsia adpressiflora* and *Vriesea splitgerberi* sclerotics layers were found only beneath the lower epidermis.

In *Ananas ananassoides* and *Aechmea mertensii* the aquiferous parenchyma was well developed. In the other species the chlorenchyma also seemed to have a water storage function.

Sclerotic fibers re-inforce the leaves of *Ananas ananassoides*, *Streptocalyx poeppigii*, *Aechmea setigera* and *Vriesea splitgerberi*.

Branched parenchyma cells were more highly developed in the leaves of *Tillandsia adpressiflora* and *Vriesea splitgerberi*.

The vascular strands in all species showed a variation in size and fiber reinforcement.

The base of the leaves were observed to function as specific starch storage areas.

The structural conditions of all the species which were studied are such as to allow them to live in the campina environment, however, due to insufficient data it was impossible to verify that these structures were specific to the campina environment.