

Leaf anatomical characters

The following characters are diagnostically useful in palm systematics (Mainly after Glassman, 1972; Tomlinson, 1990, Chapter 10; cf. also Keating, 2003b for an analysis of Araceae):

1. Lamina thickness in terms of number of cell layers.
2. Lamina with either isolateral or dorsiventral symmetry.
3. Distribution and shape of wax particles on fresh leaves.
4. Presence of epidermal papilla.
5. Frequency, distribution and configuration of trichomes.
6. Distribution and type of prominent scales on midrib or larger veins.
7. Distribution of prominent spines and their transition to trichomes.
8. Epidermal cell shape in surface view.
9. Thickness of epidermal cell walls and extent of cutinization.
10. Number of differentiated hypodermal cell layers at each surface.
11. Hypodermal cell shape in surface view.
12. Configuration of hypodermal cells around sub-stomatal chambers.
13. Distribution of expansion cell tissue.
14. Frequency of larger veins and location in relation to surface layers.
15. Frequency of smaller veins and location in relation to surface layers.
16. Complexity of bundle sheath cells and distribution of thick-walled, lignified cells.
17. Amount of bundle sheath extension to one or both surfaces.
18. Location of transverse veins (transverse commissures) and degree of bundle sheath development.
19. Presence/absence of non-vascular fibrous strands and their location.
20. Presence and distribution of solitary fibers and their wall properties.
21. Presence and distribution of mesophyll sclereids or fiber-sclereids.
22. Extent of chlorophyllous tissue.
23. Shape of mesophyll cells (palisade-like or not; with peg-connections, or not).
24. Distribution of raphide-sacs.
25. Type of silica body in silica cells (stegmata).
26. Distribution of stegmata in relation to lignified tissues.
27. Distribution of ergastic substances (e.g., tannin) and starch.
28. Type of xylem element and perforation plate in larger vascular bundles.
29. Arrangement of tissues at leaflet margin in relation to method of separation.
30. Configuration of vascular tissues in larger ribs or mid-rib.