Anatomy of the Caryotoideae

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The major groups of palms, besides being distinguished from each other by morphological features also possess combinations of microscopic anatomical characters by which they can be recognized. The following notes are a summary of the main anatomical features to be found in the caryotoid palms. The combination of these features is different from that in any other group of palms, further supporting the isolation of the Caryotoideae as a distinctive taxon. Features in which this group differ from all other palms are as follows: hairs of the leaflets each with a persistent sclerotic base surrounding 1-3 central thin-walled cells, producing an ephemeral expanse of superficial filamentous cells; guard cells of the stomata each with 2 cutinized ledges bearing numerous short transverse cuticular ribs which are very conspicuous in surface view. Features characteristic of the caryotoid palms but not of the group within which they have usually been included (Arecoideae) are the midrib or main ribs of the leaflets usually most prominent on the abaxial surface; central vascular bundles of the leaf axis not arranged in conspicuous arcs; cortex of the root including numerous scattered fibrous strands; silica cells adjacent to vascular bundles including silica bodies described as "hat-shaped."

General Anatomy of the Caryotoideae

Leaflets. Dorsiventral. Hairs each with a persistent sclerotic base surrounding 1-3 central thin-walled cells, producing an ephemeral expanse of superficial filamentous cells. Epidermis composed of files of rhombohedral, obliquely extended, even spindle-shaped cells; anticlinical walls never markedly sinuous. Guard cells of the stomata each with 2 cutinized ledges bearing numerous short transverse cuticular ribs, ribs very conspicuous in surface view. Hypodermis mostly 1-layered beneath each surface, adaxial cells hexagonal and transversely extended. Isolated fibres sometimes absent, otherwise present and with wide septate lumina, either solitary and scattered in the mesophyll or in small strands. Strands sometimes large and pectinating with the veins. Longitudinal veins usually in the abaxial mesophyll, independent of surface layers except for a few large veins buttressed to each hypodermis, mostly by colourless cells. Inner sclerotic sheath often fibrous and most well-developed above and below veins. Phloem sometimes sclerotic, rarely subdivided into separate strands by longitudinal fibrous partitions. Transverse veins situated at the same level as the small longitudinal veins, narrow, sheathed by parenchyma. Midrib or main ribs usually most prominent on abaxial surface, each including a sclerotic cylinder surrounding central ground parenchyma and including separate vascular bundles.

Leaf axis. Peripheral vascular bundles congested, with well-developed fibrous bundle sheaths, forming a rigid peripheral mechanical zone. Central vascular bundles more diffuse, not arranged in conspicuous arcs.

Root. Cortex including numerous scattered fibrous strands.

Silica bodies. Silica cells adjacent to vascular bundles including silica bodies described as "hat-shaped."

The Anatomical Relation Between the Caryotoid Palms and the Palms as a Whole.

Palms can be classified, according to the way in which the leaf segments are folded, into two major groups. The induplicate palms have leaf segments which are V-shaped in section and include *Phoenix* together with most of the fan palms. The reduplicate palms have leaf segments which are Λ-shaped in section and include all the remaining feather palms together with the fan-leaved genera *Mauritia, Mauritiella* and *Lepidocaryum.* Correlated with these morphological features are certain anatomical arrangements conspicuous in the ribs of the segments and in the leaf axis. One could refer to these anatomical types as "induplicate" and "reduplicate." The caryotoid palms, however, are distinctive because although they have induplicate morphology, their anatomy is undoubtedly of the reduplicate type.

The general anatomical conclusion about the caryotoid palms is that they can be recognized instantly from the type of hair base and guard cell they possess and apart from this that they form rather an isolated group within the palms as a whole.

Attention has been drawn to the shape of the silica bodies in caryotoid palms, this being hat-shaped and not spherical as in the arecoid palms within which the caryotoid palms have usually been included. It should be noted that several other groups of palms possess silica bodies of the same shape as those in the caryotoid palms, i.e. the bactroid, chamaedoreoid, iriarteoid and nypoid palms. However, these groups are apparently not closely related and this common feature has probably evolved independently within each group and may not be an indication of close phylogenetic affinity.

Harley Harris Bartlett
1886 - 1960

The Society has lost one of its very distinguished members by the recent death of Harley Harris Bartlett, retired Professor of Botany at the University of Michigan.

Professor Bartlett had been a diligent student of the palms and had accomplished important work with them, frequently publishing on them over a period of years.

He was born March 9, 1886, at Anaconda, Montana. In 1904 he matriculated at Harvard University. He received the A. B. degree *cum laude* in Chemistry in 1908. He took only one or two formal courses in Botany.

Professor Bartlett had extraordinary linguistic accomplishments, his attainments including fluency in Malayan and a knowledge of the finer points of the language of the Batak people in Sumatra. How many Latin descriptions of new species of plants were to come from his pen to bolster the taxonomic contributions of fellow botanists, less skilled in the classical languages!

He joined the staff of the Department of Botany of the University of Michigan