Laboratory 21: “Commelinoid” Monocots

Continuing with the monocots, we examine 4 new orders today, the Arecales, Commelinales, Zingiberales, and Poales (which we will focus on more in the next lab on the Graminoid Monocots). You only need to know Commelinales and Zingiberales to the Order level, whereas Arecaceae and Bromeliaceae we are learning to the family level.

Arecales (Palmae) – Palm Family
Trees usually with unbranched trunks; leaves large, at top of trunk, petioles sheathing, blade splits into divisions, palmate or pinnate, blade is plicate (folded like a fan); inflorescence highly branched with numerous small flowers, with bracts persistent or deciduous; bisexual or unisexual, monoecious or dioecious; flowers 3 merous, usually 6 tepals; ovary superior; of 3 carpels that may be either free or fused; fruit a drupe or rarely a berry.

Brahea
Chamaedorea
Phoenix

Order Commelinales
Herbs; leaves with a closed basal sheath, some with a purple hue, some floating aquatics with spongy, expanded stems; inflorescence typically a helicoid cyme; flowers generally bisexual and bilateral, sometimes radial; perianth either 3 sepals and 3 petals (Commelinaceae) or 6 tepals (rarely 4); stamens 6, in two series; ovary superior, 3 fused carpels; fruit a capsule.

Commelina, Rhoeo, Zebrina - Commelinaceae (Spiderwort Family)
Anigozanthos - Haemodoraceae (Bloodwort Family)
Eichhornia - Pontederiaceae (Water Hyacinth Family)

Order Zingiberales
Large herbs, often with a thick stem, vessels limited to roots; leaves usually 2-ranked (sometimes spiral), large, petiolate, with pinnate transverse venation, rolled into a tube in bud; flowers, zygomorphic or asymmetric; inflorescence showy; stamens usually reduced to 1 with showy staminodes present (5 stamens in Musaceae and Heliconiaceae); nectaries usually present on the ovary; stigma 1, funnel-shaped; ovary inferior; fruit a capsule or berry.

Musa - Musaceae (Banana Family)
Heliconia - Heliconiaceae (Heliconia Family)
Zingiber - Zingiberaceae (Ginger Family)
Calathea, Maranta - Marantaceae (Prayer Plant Family)
Canna - Cannaceae (Canna Family)
Bromeliaceae – Pineapple Family

Epiphytic or terrestrial herbs; leaves stiff, often spiny with colored bases usually concave, often forming a basal rosette, some modified for water storage; specialized peltate trichomes present, water-absorbing; flowers 3-merous, bisexual, regular, calyx often green and corolla often showy, subtended by a bract; stamens 6, often attached to base of the perianth; ovary superior or inferior, composed of 3 fused carpels; one style with 3 stigmas, stigmas spirally twisted; fruit a berry or a capsule.

Tillandsia
Ananas
Puya
figures from Lawrence 1951. Taxonomy of Vascular Plants
Fig. 93. MUSACEAE. A, Musa paradisiaca; Aa, plant in fruit and flower, much reduced; Ah, inflorescence, × 1; Ab, flower, × 15; Ap, anther, × 2; Aq, stigma, × 5; Ar, ovary, × 1. Bb, zygomorphic flower, × 15; Bc, same vertical section (sepals partially removed), × 15; Bd, ovary, cross-section, × 2. (From L. H. Bailey, Manual of cultivated plants, The Macmillan Company, 1949. Copyright 1924 and 1949 by Liberty H. Bailey.)

ZINGIBERACEAE. GINGER FAMILY

Fig. 94. ZINGIBERACEAE. A, Hedychium coronarium; Aa, flowering stem, × 1; Ab, flower, × 1; Ac, anther, × 1; Ad, pistil, × 1; Ae, ovary, × 1. B, Alpinia officinarum: inflorescence, × 1. (From L. H. Bailey, Manual of cultivated plants, The Macmillan Company, 1949. Copyright 1924 and 1949 by Liberty H. Bailey.)

MARANTACEAE. A, Maranta bicolor; Aa, flowering branch, × 1; Ab, flower, × 1; Ac, anther, × 1; Ad, pistil, × 1; Ae, ovary, × 1; Af, ovary, cross-section, × 5. B, Calathea lancifolia; Bb, inflorescence, × 1; Bc, ovary, cross-section, × 5. (From L. H. Bailey, Manual of cultivated plants, The Macmillan Company, 1949. Copyright 1924 and 1949 by Liberty H. Bailey.)

Fig. 95. CANNAEAE. Canna generalis: a, flowering plant, much reduced; b, flower (a sepal, × 6; p petal, × 6; stamen, × 6; stigma, × 6); c, flower, vertical section, × 15; d, ovary, × 15. (From L. H. Bailey, Manual of cultivated plants, The Macmillan Company, 1949. Copyright 1924 and 1949 by Liberty H. Bailey.)

figures from Lawrence 1951. Taxonomy of Vascular Plants