

Vascular Plants of Williamson County
Carya illinoensis – PECAN [Juglandaceae]

Carya illinoensis (Wangenh.) K. Koch, PECAN. Tree, fall-deciduous, 1-trunked, in local wildlands mostly < 14 m tall (individuals in range sometimes taller where cultivated as landscape specimens or where a former grove occurs in bottomland); monoecious; shoots with only cauline leaves, young shoots having scattered, short “stellate” (tufted or fasciculate) hairs with 1–6 ascending arms, dotted with reddish, umbrella-shaped (peltate) scales, and with short-stalked glandular hairs, aromatic when crushed. **Stems:** initially somewhat angled, with 3 angles descending from each enlarged leaf base, twigs having large, broadly heart-shaped to broadly shield-shaped leaf scars to 7 mm across + an obovate scar of axillary bud, green stems with short stellate hairs, some scales, and upright, minute to short-stalked glandular hairs; twig periderm and young bark red-brown to brown aging gray-brown to gray (= dried epidermal surface) and lacking hairs, lenticels circular to elliptic (axial orientation) in outline; twig pith ± solid and brown; axillary bud conic or compressed-conic, mostly < 5 mm long, covered with a pair of fused prophylls (valvate), dotted with reddish scales and scattered short stellate hairs, and a tuft of longer hairs at tip; mature bark mostly firmly attached, cracked with furrows and variable with plates, gray except brown where new inner bark exposed. **Leaves:** helically alternate, odd-1-pinnately compound having (3–)4–6 opposite to subopposite pairs of lateral leaflets, spaced to 55 mm apart along rachis, petiolate, without stipules; petiole enlarged at base (not a pulvinus) nested around axillary bud, above base ± hemi-cylindric with midvein somewhat raised on upper side (convex), mostly < 70 mm long, especially sparsely puberulent with tiny nonglandular and glandular hairs and peltate scales; rachis somewhat 4-sided (± rhombate in ×-section), with leaflets arising from the upper 2 faces of rachis, having hairs as on petiole; petiolules of lateral leaflets enlarged on lower side and somewhat flattish on upper side, to 3.5 mm long, of terminal leaflets ± cylindric (no distinction of rachis and petiolule) enlarged at base, 7–19+ mm long; blades of leaflets symmetric (terminal leaflet) and asymmetric (lateral leaflets) with midrib closer to trailing edge, broadly lanceolate to narrowly ovate (broadly oblanceolate terminal leaflet), < 25–135 × (7–)16–47 mm, the smallest leaflets at base to the largest in the pair adjacent terminal leaflet, oblique-tapered to somewhat roundish at base, conspicuously serrate and short stellate-ciliate on margins with mostly 2–5 ascending arms on hairs, margin on leading side entire to below midblade, acuminate at tip, pinnately veined with principal veins slightly raised on upper surface and raised on lower surface, initially surfaces dotted with abundant peltate scales aging reddish, lower surface aging glabrescent and with tufts of nonglandular hairs along midrib (domatialelike). **Inflorescences:** staminate aments (catkins) emerging and elongating in early spring from a dormant axillary bud on a young woody twig (typically year 1 from herbaceous spring shoot of the previous year; the aments initiated in developing buds on the first-year spring growth); pistillate flowers several on a shoot produced on new spring growth following the emergence of aments. **Staminate inflorescence:** racemelike ament (catkin), in 1 side-by-side 3-ament cluster per node (fascicle), each peduncle free at base or 3-ament cluster arising from a node at top of an axis internode < 10 mm long, the internode compressed and extended from twig, aments pendent, in range mostly 45–115 × 5–7(–8) mm (including peduncle), aments of a cluster unequal with the central ament longer and having a longer and thicker peduncle, each ament forming 70+ flowers, flowers alternate,

radiating, and unevenly spaced along rachis with short internodes, bracteate, axes with reddish peltate scales and sometimes short stellate hairs; bud scale subtending the 3-ament cluster at node, appearing broadly ovate (in bud encircling node, valvate), 7–8 × 8–9 mm, length < width, red-brown, truncate and many-veined at base, having 2 principal veins forming as low ridges and converging at tip, densely pubescent with tannish, upward-pointing hairs; peduncle of ament 4–12 × ca. 0.8 mm, green, densely glandular-hairy with stalked hairs; rachis angled and ridged with a ridge descending from each flower stalk (“pedicel”), whitish to light green, with sparse peltate scales; pedicel stout, 0.3–0.8 mm long; bracts subtending flower (of various authors termed bracts, bracts + bracteoles, bracts to bracteoles, or perianth) not whorled, consisting of a 3(–4)-lobed bract unit appressed to the downward-oriented flower and (0)1(–2) unlobed bract on other side of flower, green, short-hairy on lower surface and with several longer hairs at tips, the 3-lobed bract 2–4.5 × 2.2–4 mm, the longest near the base of the ament and gradually decreasing in length and width especially above ament midpoint to tip, the central lobe positioned outside the lateral lobes, acute-ovate, to 3.5 × 0.8–1 mm, the shorter and wider lateral lobes ovate to obovate often cupping anthers and mostly obtuse to rounded at tip (the pair ± heart-shaped), free bract or bracts acute-ovate or elliptic (diminutive bracts), < 1–2 × 0.4–1.3 mm decreasing upward and often absent on flowers above ament midpoint to tip, if only 1 free bract typically formed ca. 180° from center of 3-lobed bract. **Staminate flower:** irregular to somewhat bilateral, 2.5–4.5 mm across with the widest flowers having the most stamens (below ament midpoint) and the fewest stamens (approaching tip of ament); **calyx** obscure or absent; **petals** absent; **stamens** (2–)3–7, free, ± sessile, having decurrent bases on elongated receptacle and appearing sometimes in 2 ranks; filaments 0–0.35 mm long, greenish, glabrous; anthers spreading to ascending, basifixed, dithecal, (1–)1.4–2.1 mm long, having the shortest anthers approaching the ament tip, light green, pubescent with scattered, 1–3-armed stellate hairs, longitudinally dehiscent; pollen copious, pale yellow, dry and wind-dispersed; **pistil** absent. **Pistillate inflorescence:** spikelike, on a new springtime shoot above staminate inflorescences, the spring shoot initially with ca. 4 expanded leaves followed by 4 unexpanded leaves below the spike, from the 2 axillary buds closest to the spike immediately producing new vegetative shoots (syllaptic) but at anthesis < spike, spike at pollination to 25 mm long, (2–)3–5(–8)-flowered (the uppermost flowers often abort), flowers sessile, spreading to ascending on rachis, bracteate (perianthlike), densely covered with peltate scales; peduncle ± cylindrical, < 2–10 mm long, with short stellate hairs having to 3 ascending arms and stalked glandular hairs; rachis somewhat zigzagged, to 10 mm long, yellow-green, having nonglandular and glandular hairs, with internodes short– < 2 mm long; bract subtending involucre absent; **involucre** containing pistillate flower, ± bell-shaped, ca. 4 × 2.2–2.5 mm, light green, formed by fusion of bracts, bractlets, and bracteoles (= 4 total) into a single uniform structure fused to and surrounding the entire ovary, covered with peltate scales, body 4-ridged with ridges descending from 4 spreading “bracts” in 1 whorl (resembling a calyx) spreading ⊥ from rim of involucre, the ridges alternating with furrows from above midpoint; calyxlike “bracts” subequal to unequal, acuminate-triangular, 4–5 × 1 mm, 1-veined, mostly flat, upper surface glabrous, lower surface having a raised midvein, nonglandular hairs (including margins), and scattered reddish peltate scales < 0.1 mm across; where bracts unequal, 2 bracts on upper side of flower somewhat keeled and awl-shaped and < flatter,

longer bracts, 2.5–3 mm long, 1 bract on upper side occasionally notched at tip. **Pistillate flower:** ca. 3 mm across (5–6 mm across with spreading bracts); **calyx** absent; **petals** absent; **stamens** absent; **pistil** 1, ovary within and fused to involucre; ovary inferior, ellipsoid, 1–1.2 mm diameter, 2-chambered, with 1 ovule; stigma sessile, roughly conic 2-lobed (cleft above midpoint), ca. 3–4 × 2.2–3 mm, initially green becoming orangish at pollination and reddish purple after pollination, coarsely papillate-ridged, lobes somewhat pyramidal, basal tissue deflexed between bracts and wider than involucre. **Fruit:** nut indehiscent, to 5 per cluster, enclosed in a thick, dehiscent husk (\pm dehiscent “drupe” of various authors), 1-seeded, 4-valved, before dehiscing broadly elliptic to ovoid, of noncultivated plants in range 30–45+ × 22–34+ mm, green aging blackish brown, 4-ridged (sutures short-winged), valves elliptic to ovate in outline, 16–21 mm wide, 4.2–7 mm thick, leathery; nut shell (pericarp, hardened ovary wall) ovoid to ellipsoid, 26–40+ × 12–20+ mm, brown mottled black, enclosing a lobed, strongly convoluted embryo with large fleshy and oily cotyledons.

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