

Vascular Plants of Williamson County

Nelumbo lutea – AMERICAN LOTUS, WATER CHINQUAPIN [Nelumbonaceae]

Nelumbo lutea Willd., AMERICAN LOTUS, WATER CHINQUAPIN. Aquatic perennial herb, robust and clonal, rhizomatous often with axes in substrate intertwined, at end of growing season rhizome segments forming tubers (before winter dormancy; stem tubers), fibrous-rooted, 1 leaf per rhizome node, foliage floating and emergent, floating and elevated blades of differing widths, leaf sometimes paired with 1 inflorescence to 100 cm above water; shoots with only basal leaves arising from wet substrate, umbrellalike (centrally peltate) with foliage circular in outline, unfurling from 2 halves inrolled to the upper side maturing horizontal and essentially flat (dimple at center) to wide funnel-shaped with low point at petiole and often floppy, young axes and lower surface of leaves purple-dotted, glabrous often bluish glaucous, foliage nonwetable on upper surface; latex white; rhizomes deep-seated in bottom muck (shallow water) and mud, \pm horizontal, somewhat angular, 5+ mm diameter, internodes long sometimes 200+ mm long, white or sometimes with purplish blotches, herbaceous, in \times -section with 8 wide air canals in a ring, scale at node = open, sheathlike and appressed to internode, 20–45 mm long, brown to brownish and ridged with parallel veins; tuber club-shaped to banana-shaped, brown with purple dots, ca. 80 \times 15 mm (observed individual), with many adventitious roots at base, in \times -section having a ring of air canals; adventitious roots in dense nodal clusters and tufts along rhizomes, principal roots to 200+ long. **Stems:** = pedicels of axillary flowers. **Leaves:** helically alternate, simple, long-petiolate at center of blade, with stipulelike structures (not observed); petiole cylindrical, 350–1100+ \times 5–17 mm, diameter approaching blade scaling with length, white (submersed) and green (emergent) and at least young emergent petiole with many purple dots, initially smooth but some dots fading and some purple dots developing as low, light green, pimblelike mounds often having a minute, downward-pointing purple scale, initially flexible aging stiff, in \times -section having 6–15 principal air canals to 3+ mm diameter (radial), with microscopic aggregates of crystals (druses) lining air canal wall; blade circular and peltate (petiole attached at center), in range (80–)270–650+ mm, somewhat tough, green with upper surface aging bluish green, entire, petiole scar disc in center depressed, circular, 8–22 mm and tannish, conspicuously palmately veined from edges of petiole disc, principal veins 21–26, dichotomously forked 3 times, the principal vein straight to first fork \gg midblade (to 200 mm long), the first-order branch to 45 mm long, the second-order branch to 6 mm long and not ending at margin, principal veins conspicuously raised on lower surface (providing structural support for blade tissue), crossveins between principal veins never straight or parallel, upper surface uniformly textured with minute papillate projections of cells (= nonwetable surface), lower surface pale light green aging with sunken patches of cells (networklike pattern), when young having abundant purple dots on mostly tissue but some along veins aging obscure on old leaf. **Inflorescence:** axillary solitary flower, on long, woody, emergent pedicel with a terminal flower bud erect and ovoid, at anthesis flower opening upward aging with perianth widely spreading and mostly horizontally oriented; bractlet subtending pedicel (at rhizome) sheathing, membranous aging papery-brown; pedicel cylindrical, to 9 mm diameter, green initially conspicuously purple-dotted and smooth aging low bumpy with sparse purple dots, aging with woody and fibrous tissue, in \times -section having a ring of 6 or more large air canals. **Flower:** bisexual, radial, when fully open 150–210 mm across, scent faint-fruity;

receptacle conspicuous in open flower, lower portion barrel-shaped (perianth and stamens attached), upper portion funnel-shaped and flat-topped (“torus”), at anthesis 30–35 × 25–30 mm and length > width with width greatly increasing in fruit, sides pale yellow and top light yellow, somewhat spongy and having a set of vertical pits open to top, each pit with an overarching rim forming a narrow orifice, at anthesis pit chambers oval and ca. 10 × 5 mm; **nectaries** absent (minute osmophores producing fragrance); **perianth** segments (“tepals”) ± 23, helically alternate in close, graded series, entire, glabrous, the outermost segments persistent in fruit, mostly 2–4, ovate and acute to obtuse at tip, 17–25 × 9–12 mm, initially light green or with many purplish parallel veins often remaining pigmented and aging brownish and purplish, other segments abscising after pollination, in next series of ± 5 obtuse-ovate cupped, increasing from 27 mm long to 70 mm long, light green in bud changing to pale yellow with faint parallel veins, inner series of ca. 14 segments expanding after anthesis, initiating ascending later widely spreading, cupped and obovate rounded at tip, to 110 × 55 mm, pale yellow fading to cream-colored, parallel veins easier to observe on lower surface, abscising with stamens; **stamens** ± 150, helically alternate in 4 close series, free, forming a dense fringe around the pedestal-like receptacle; filaments ascending, linear and hemicylindric, in range 10–13 mm long, white; anthers basifixed, dithecal, linear, 14–17 mm long, orangish yellow, longitudinally dehiscent base-to-tip, at top having an extension of connective = an appendage at level of stigmas, spreading and slightly curved later often 1-coiled, appendage in range linear, 6.5–8 mm long and yellowish, downward if coiling to 360°; pollen yellow; **pistils** in range 9–15, widely spaced and embedded in top side of receptacle, each pistil formed within a vertical pit having an overarching external rim; ovary superior and short-stalked, oval-ellipsoid and tight-fitting within vertical pit, nipplelike tip visible beneath rim, 10–11 × 5 mm, pale yellow or greenish at tip, wall ca. 0.4 mm thick, 1-chambered with 1 ovule pendent from top; style with stigma exerted through rim, ca. 1 mm long, orangish brown, stigma ca. 1.5 mm across with depressed center. **Fruits:** nuts in an aggregate fruit, in range nuts 9–15 per flower, indehiscent and hard-walled, 1-seeded, embedded in deep and broad pits (orifice aging circular to polygonal or irregular to 20 mm across) within upper portion of an elevated and expanded receptacle, the receptacle persistent on a long pedicel projecting above water, aggregate fruit horizontal on straight pedicel or more commonly facing sideways to stiffly nodding having the uppermost portion of pedicel arching; pedicel with submersed portion from rhizome, emergent portion erect to ascending, cylindric, and stiff, emergent portion in range 350–1050 mm long (thickness scaling with length), green, surface slightly roughened with widely scattered, low mounds, each mound with a triangular, red-purple, downward-pointing scale < 0.4 mm long, pedicel in \times -section with a ring of 6 longitudinal air canals, each canal 1–1.4 mm across (radial); persistent tepals commonly 3–4 at top of pedicel = the radiating outermost tepals brown or with purplish veins and dry, above persistent tepals having a columnar section of conspicuous tepal and inconspicuous filament scars (lower receptacle), 6–7 × 10–11 mm, gray; fruit-bearing receptacle funnel-shaped (muffin-shaped) and flattened to slightly convex at top, in range 65–90 mm across and 45–50 mm long, spongy, green maturing blackish, the top approximately circular and edge scalloped in face view, the sides fluted by expanded pits; nuts in pits subequally spaced and each surrounded by a rim, having the top of each nut mostly exposed within the pit and either slightly lower than rim or occasionally projecting

to 5 mm above the rim; nuts when fertile in range nearly spheric to subspheroid or ovoid (round at base and obtuse at top, melonlike), in range 11–15 × 9–12 mm and dull gray (smaller fruits compressed and possibly infertile), with about 30 faint and darker longitudinal lines, having an indentation at base where stalk abscised, surface appearing waxy and with minute, evenly spaced pits (foveolate), subsurface color mostly orangish brown, periderm wall mostly 0.5–0.8 mm thick; style with stigma persistent at top of nut (beak), ca. 1 mm long, dark brown. **Seed:** tightly enclosed by pericarp, lacking aril; seed coat thin, dull orangish, somewhat flakey, embryo filling seed (no endosperm).

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