

## Vascular Plants of Williamson County

*Amaranthus tuberculatus* – ROUGH-FRUITED WATER-HEMP, NUTTALL'S WATER-HEMP,  
ROUGH-FRUITED AMARANTHUS

*Amaranthus tuberculatus* (Moquin-Tandon) J. D. Sauer (syn. *Amaranthus rudis*), ROUGH-FRUITED WATER-HEMP, NUTTALL'S WATER-HEMP, ROUGH-FRUITED AMARANTHUS. Annual, not spinescent, taprooted, not rosetted, 1–several-stemmed at base, with spreading to ascending branches, in range 50–90 cm tall; dioecious; shoots with only cauline leaves, appearing glabrous but initially with some delicate, shaggy hairs on very young shoots (incl. inflorescence). **Stems:** strongly ridged, to 10+ mm diameter, with 3 ridges (broad central ridge and 2 lateral ridges) descending from leaf, axillary axis swollen and beet-red at base, ridges often light beet-red, older stem tough and often striped. **Leaves:** helically alternate, simple, petiolate, without stipules; petiole deeply channeled, to 35 mm long, edges light beet red to whitish; blade lanceolate to elliptic or oblong, in range  $< 15\text{--}50+ \times < 4\text{--}20+$  mm,  $>$  petiole,  $\pm$  flat, tapered at base, entire and sometimes somewhat wavy on white margins, obtuse to truncate or rounded to shallowly notched with short point at tip, pinnately veined with principal veins sunken on upper surface and conspicuously raised on lower surface, lower surface somewhat reflective and veins and margins showing whitish inclusions (crystal aggregates). **Inflorescences:** panicles, spikelike and terminal, of many short, highly condensed cymes of unisexual flowers (glomerules), cymes helically alternate, 1 cyme per node, panicle to 150+ mm long, above midpoint with closely spaced cymes and rachis internodes concealed and also lacking leaflike bracts, below midpoint often interrupted having rachis visible where internodes longer, at the lowest nodes having leaflike bract at each node with an axillary cyme, elsewhere in the canopy with sessile cyme at base of certain branch axes, flowers 100+, sessile, bracteate, essentially glabrous; rachis strongly ridged, sparsely haired with shaggy hairs to 1 mm long. **Staminate inflorescence:** mostly 9–10 mm diameter, each cyme initially dichasial with 3 flowers (terminal + 2 lateral flowers) later increasing to 7+ flowers; bract subtending cyme fused to short peduncle, spreading to ascending, triangular, ca.  $2 \times 0.5$  mm, white to about midpoint and green and 1-veined above midpoint, margins membranous, with short point to 0.4 mm long at tip, sparsely short-ciliate on margins below midpoint; internodes of cyme  $< 1$  mm long; bractlet subtending flower ca. 2 mm long, similar to bract with wider membranous margins more cupped. **Staminate flower:** radial, 3–4 mm across (when releasing pollen), abscising after pollen released; **sepals (tepals)** 5, helically alternate, in range subequal with outer 2 slightly longer, ovate with short point at acute to obtuse tip,  $2.7\text{--}3.1 \times 1\text{--}1.6$  mm, membranous with green midvein, midvein above midpoint rounded on back to spinelike point at tip, sometimes sparsely short-ciliate below midpoint; **stamens** 5, free; filaments spreading, ca. 2 mm long, colorless; anthers dorsifixed, dithecal,  $\pm 1.3$  mm long, glossy yellowish green, longitudinally dehiscent in bud; pollen copious, pale yellow, dry; **pistil** vestigial in center, nipplelike,  $< 0.5$  mm long, green. **Pistillate inflorescence:** 4 mm diameter, cyme highly condensed with 7+ flowers; bract subtending cyme fused to short peduncle lanceolate-oblong, ca.  $1.6 \times 0.4$  mm (narrower than bract of staminate flower), with green midvein rounded on back and a short point at tip, somewhat folded along midvein; internodes of cymes short; bractlet subtending flower like bracts with short point at tip. **Pistillate flower:** bilateral,  $< 1$  mm across; **sepals** mostly 2, opposite, dimorphic, the larger bractletlike, 2 mm long having a green midvein rounded on back and a short,

spinelike point at tip, the other ovate to elliptic, 0.7–0.9 mm long, thin, veinless, and colorless, sparsely short-ciliate on margins, tepals persistent; **stamens** absent; **pistil** 1, at anthesis ca. 1.2 mm long; ovary superior, ellipsoid, ca. 0.6 mm long, light green, glabrous, 1-chambered with 1 ovule; styles (2–)3, ascending, axis greenish, stigmatic and short-branched base-to-top. **Fruit:** utricle, dehiscent around circumference at midpoint (circumscissile) with top easily separated as cap when touched and basal portion persistent, 1-seeded (vertically oriented), not surrounded by a persistent calyx but in range mostly with 2 opposite, dissimilar tepals on narrow sides, fruit obovoid compressed side-to-side, ca. 1.5 × 1–1.2 × 0.9–1.1 mm, pale green aging papery and light brown, with 3 persistent styles, having a thin, bumpy (rugose) wall and on cap often 3 fine ridges descending from styles. **Seed:** lens-shaped, in range 1 × 0.7–0.8 mm, glossy dark reddish brown, smooth.

A. C. Gibson