

*Arundo donax* L., GIANT REED, SPANISH CANE. Perennial, bamboolike, evergreen with overwintering leaves on principal canopy shoots, clonal, rhizomatous, fibrous-rooted, aboveground principal shoots erect to ascending, with 1–several ascending to spreading lateral branches from any node midplant (or at any node when plant damaged), in range 250–800 cm tall; shoots with only cauline leaves, essentially glabrous; rhizomes shallow, horizontal and long-creeping, typically 30–60 mm diameter (mature plants), with brownish scales; adventitious roots on lower side of rhizome. **Stems (culms):** cylindric, of principal axes (1° shoots) living 2 or 3 years, (16–)24–33+ mm basal diameter and becoming woodlike before year 2, of lateral shoots pencil-like and rigid, < 14 mm diameter, internodes 50–290 mm long; internodes hollow. **Leaves:** alternate distichous, simple with sheath, on each lateral shoots dimorphic with a distinctive first leaf (prophyll); prophyll with overlapping open sheath, triangular-deltate in outline and strongly 2-keeled and stiff-biconvex, 6.5–9 mm long, green with narrow membranous margins, keels + adjacent surfaces densely sericeous, the hairs 4–5 mm long, silvery white; sheath open, not keeled, persistent and gray or brownish after blade abscises, collar yellowish tan, wavy and rounded on margin, long-villous at basal margin; ligule membranous and ciliate, 1–1.6 mm long, as wide as leaf blade; blade narrowly lanceolate, gradually long-tapered (small and triangular for 1–2 blades next to rhizome), (35–)120–860 × 15–77 mm, < and narrower on lateral shoots, dull, somewhat glaucous, flat, minutely toothed on margins, with long, linear tip, parallel-veined with midvein conspicuous on basal 1/3. **Inflorescence:** spikelets, in terminal panicles, panicle plumose, 380–550 × 80–150 mm, with alternate distichous clusters of ascending lateral branchlets, branchlets stiff, 50–220(–270) mm long, typically with grayish and purplish spikelets, spikelet with 3–5(–6) florets, bracteate, short-awned; branch and branchlet axes low-ridged, minutely scabrous, the stalk beneath a spikelet minutely short-hairy. **Spikelet:** slightly compressed side-to-side, in range 11–13 mm long (including awns), bisexual (the terminal floret sterile and diminutive), breaking above glumes and between florets; **glumes** 2, ± equal, lanceolate and long-acuminate, 8.5–11.5 mm long, ± without awns, membranous and often purplish on rounded back, with 3 or 5 veins, the veins raised especially on upper glume with midvein only extending to tip, glabrous; rachilla flattened, ± 0.5 mm long and pubescent between glumes, ± 0.2 mm long below first floret with basal tuft of hairs, segments 0.8–2 mm long and glabrous, forming the longest internode below the terminal (sterile) floret; **lemma** awned, lanceolate, 10–12 mm long (including awn), tannish scarious, rounded on back, 2-forked having teeth or bristles with awn arising from notch, teeth sometimes with bristle tip, 5–7-veined basally to 3-veined at tip for teeth and awn, conspicuously pilose below midpoint, the hairs fine, 4.5–8 mm long, veins green becoming purplish approaching tip, the awn 2–2.8 mm long, delicate, bristle tips 1–2 mm long; **palea** < lemma, oblanceolate, 3.5–5.5 mm long, mostly colorless but pale green at base and sometimes purplish at tip, truncate or slight notched and conspicuously short-ciliate at tip, 2-veined, 2-keeled, densely and fine-hairy along keels, sparsely pilose at base. **Flower:** bisexual; **perianth (lodicules)** 2, ± inversely pyramidal to trapezoidal or ± 3-toothed with short, rounded to obtuse lateral teeth and an elongated middle tooth, 0.3–1.25 × 0.3–0.6 mm, the middle tooth = length of lodicule body, long-tapered at base, hairy or finely fringed and sometimes reduced to a threadlike extension; **stamens** 3, free; filaments threadlike, 2.5–5 mm long, translucent; anthers dorsifixed (attached to base of connective), dithecal, linear, 1.7–3.2 mm long, yellow-

green, connective 0.5–1 mm long, longitudinally dehiscent; pollen pale yellow; **pistil** 1; ovary superior, ellipsoid, 0.5–0.8 mm long, at anthesis olive green to dark brown, glabrous, 1-chambered with 1 ovule; styles 2, spreading, 2.5–3.4 mm long, dark brown at thickened base and translucent-white below stigmas, stigmatic above midpoint; stigmas exerted sideways from lemma and palea,  $\pm 0.6$  mm wide with dense, spreading, purplish to brown hairs. **Fruit:** achene (caryopsis), in range abortive,  $\pm$  ellipsoid, aborted fruit ca.  $1 \times 0.4$  mm (mature fruit oblong and 3–4 mm long), with 2 teeth from persistent style bases. Late September–mid-November.

Naturalized. Bamboolike perennial found throughout the range along creeks and drainage ditches but also at coastal beaches and planted or established along roadsides. *Arundo donax* is a sterile invasive that clones via a vigorous rhizome system; whole plants or rhizomes are sometimes set afloat during strong storm runoff and thereby transported downstream to start another population. This species has alternate distichous, broad, flat leaves are often strongly two-ranked along the upright stems (“poles”), and stems become wooden and hard during year two by forming thick, cellulosic cell walls with little lignin. Lateral shoots begin arising from leaf axils during the first summer, forming spreading lateral shoots with much smaller leaves. By the second winter, the principal stems are totally hardened, and can be cut, harvested, and dried slowly, so the hollow internodes can be fashioned into vibrating reeds for woodwind instruments. This species rarely flowers, but in range individuals established close to street lamps apparently receive enough prolonged late summer light to initiate flowering. A gigantic, plumose inflorescence is then produced with hundreds of spikelets, about the size but darker and coarser than on *Cortaderia*; its glumes are glabrous, but long hairs arising from the lemmas and bases of paleae are conspicuous. To date nobody has found a fertile fruit of *Arundo* occurring in California.

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