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var. *hirtella* (Piper) Her  
inently long-scabrous near t  
disturbed areas, desert scrub to  
gen < 1500 m. CA (esp s CA-FP); to B.C., Colorado, TX, Baja CA.  
[*Festuca o. ssp. hirtella* Piper]

var. *octoflora* SPIKELET: lemma back glabrous or barely  
scabrous, margins often scabrous. Sandy soils, washes, hills, chap-  
arral; gen < 2000 m. s CA-FP, D; widespread Am, Eur.

ZIZANIA WILD RICE

Ann, per, monoecious, aquatic. STS erect, < 3 m, 1 cm wide. LF: ligule membranous, narrow; blade < 1.2 m, 2.5 cm wide.  
INFL panicle-like; lower branches spreading to ascending, bearing staminate spikelets; upper branches ascending to erect,  
bearing pistillate spikelets. STAMINATE SPIKELET gen drooping; glumes vestigial, forming a collar-like ridge; floret 1;  
lemma linear, 5-veined, acuminate or awned; palea 3-veined; stamens 6. PISTILLATE SPIKELET gen ascending to erect,  
cylindric, angled, firm; glumes gen 0; floret 1, lemma 3-veined, long-tapered, awned. FR 1-2 cm, cylindric, purplish black.  
3 spp.: N.Am, e Asia. (Greek: ancient name for weed in grain fields) [Dore 1969 Canada Dept Agric Res Publ 1393]

*Z. palustris* L. var. *interior* (Fassett) W. Dore WILD RICE ST 10-20 mm; awn 5-40 mm. 2n=30. Wet meadows, shallow ponds,  
puberulent at nodes. LF 15-45 cm, 6-40 mm wide. INFL 2-5 dm. lake margins; < 1200 m. NCoRI, ScV, MP; native to Can, e US.  
STAMINATE SPIKELET 6-8 mm. PISTILLATE SPIKELET Cult for food, waterfowl.

PONTEDERIACEAE PICKEREL-WEED FAMILY

Elizabeth McClintock

Per, ann, submersed, emersed, floating, or on wet ground. LVS simple, alternate or whorled, ± in basal rosette or not; blade  
linear (esp underwater) to round, sagittate or cordate or not, bases gen sheathing, veins parallel; petioles sometimes inflated  
or 0 (esp underwater). INFL: raceme, spike, panicle, or 1-flid, terminal but often appearing ± axillary, subtended by sheath-  
ing bract. FL bisexual, radial or ± bilateral; perianth lobes gen 6, in 2 series of 3, petal-like; stamens equal or not, attached to  
perianth tube at various levels, 3, 6, (1, 4), sometimes 3 sterile, modified; ovary superior, 1-3-chambered. FR: 1-seeded  
utricle or many-seeded, loculicidal capsule. SEEDS small, longitudinally ribbed or not. ± 6 genera, 30 spp.: most pantrop,  
some temp. Some cult as orn, some weeds, esp in rice fields. [Rosatti 1987 J Arnold Arb 68:35-71]

- 1. Pl gen free-floating; petiole inflated or not; infl gen many-flid ..... EICHHORNIA
- 1' Pl submersed, emersed, or on wet ground; petiole not inflated; infl 1-few-flid
- 2. Infl 1-flid; stamens 3; perianth salverform, tube > 1 cm ..... HETERANTHERA
- 2' Infl a few-flid raceme; stamens 6; perianth bell-shaped to rotate, tube < 1 cm ..... MONOCHORIA

EICHHORNIA WATER HYACINTH

Per, gen free-floating. STS stout, erect, often connected by stolons. LVS ± in basal rosette; blade gen ovate to round; petiole  
inflated or not, gen > blade. INFL: spike, panicle, or 1-flid. FL ± bilateral; perianth funnel-shaped, lobes 6; stamens 6, un-  
equal in length; ovary 3-chambered. FR: capsule. SEEDS many, longitudinally ribbed. ± 7 spp.: native to Am trop, perhaps  
Am subtrop, Afr; some widely naturalized. (J. A. F. Eichhorn, Germany, 1779-1856)

*E. crassipes* (C. Martius) Solms-Laubach (p. 1307) WATER HYA- sloughs, waterways; < 200 m. GV, SnFrB, SCo. PR; native to trop  
CINTH ST > 30 cm. LF < 10 cm wide. INFL 5-15 cm, ± 3-35-flid. Am. Pls multiply, spread rapidly by vegetative means; perhaps the  
FL: perianth lilac or pale blue to white. Locally abundant. Ponds, world's most troublesome aquatic weed.

HETERANTHERA MUD PLANTAIN

Per, ann, gen submersed, emersed, or on wet ground. ST ± erect, slender, elongate, ± spreading, rooting at nodes or stout.  
LVS alternate, linear, sessile, or ± in basal rosettes, ± ovate, long-petioled. INFL gen 1-flid. FL ± radial; perianth salverform,  
lobes 6; stamens 3, alike or of 2 sizes, shapes, anthers coiling or not; ovary 1-chambered. FR: capsule. SEEDS many, longi-  
tudinally ribbed. ± 12 spp.: trop, temp Am, Afr. (Greek: different, anther, from unequal anthers of most spp). Fls developed  
underwater gen cleistogamous.

- 1. Lvs linear, sessile, alternate on slender, ± spreading, gen much-branched, often tangled sts; fl sessile; perianth yellow ..... *H. dubia*
- 1' Lvs ± ovate, long petioled, ± in basal rosette on gen stout, ± erect, often tufted, branched or un-branched, rarely tangled sts; fl peduncled; perianth white to blue-purple ..... *H. limosa*

*H. dubia* (Jacq.) MacMillan WATER STAR-GRASS (p. 1307) Per, gen submersed. ST often rooting at nodes. LF > 15 cm. FL appear-  
ing ± axillary; perianth yellow, tube ± 1.5(-7) cm; stamens 3, alike, anthers coiled. Uncommon. Still or moving water; < 1500 m.  
NCo, ScV, MP; widespread N.Am, C.Am. Vegetatively ± similar to spp. of *Potamogeton*, exc lvs lack distinct midrib. Fresh water  
margins: 1-5, 6-9, 10, 11, 14-17, 18-24.

*H. limosa* (Schwartz) Willd. Ann, gen emersed or on wet ground (submersed as seedlings). LF: blade > 4 cm; petiole > 15 cm. FL appearing ± terminal; perianth white to blue-purple, tube > 1.5 cm; stamens 3, of 2 sizes, shapes, anthers not coiled. Uncommon. Rice fields; < 100 m. ScV; native to c&e US, trop Am.



**SPIKELET:** glumes 2-3(4) mm, subequal  
rets 5-15(25); lemma ± 5 mm, teeth equal  
short awn-tipped; palea ± = lemma; anthers  
narrowly elliptic. 2n=32. **ENDANGERED**  
< 625 m. SW (Los Angeles, Riverside, San

**O. inaequalis** Hoover (p. 1279) SAN JO.  
GRASS Pl cespitose, hairy, grayish. **ST**  $\frac{1}{2}$   
spreading, forming mats, 5-15(25) cm. **LF:**  
**INFL** 2-3.5(5) cm, ± head-like; spikelet  
**SPIKELET:** glumes ± 3 mm, subequal, irregularly toothed; florets  
4-20(30); lemma 4-5 mm, teeth ± 1/2 lemma body length, awn-  
tipped, central tooth >> lateral; palea ± = lemma; anthers ± 2 mm.  
**FR** ± 1.5 mm, widely elliptic. 2n=24. **ENDANGERED** CA. Vernal  
pools; < 200 m. SnJV (Fresno, Madera, Merced, Stanislaus,  
Tulare cos.). [*O. californica* var. *i.* (Hoover) Hoover]

**O. pilosa** Hoover (p. 1279) HAIRY ORCUTT GRASS Pl cespitose,  
gen densely hairy. **ST** decumbent to erect, 5-20(35) cm. **LF:** sheath  
and blade gen separated by line when dry; blade 3-5(8) mm wide.  
**INFL** < 10 cm, exserted with age; spikelets crowded at tip, ± over-  
lapping below. **SPIKELET:** glumes ± 3 mm, irregularly 3-toothed;  
florets 10-40; lemma 4-5 mm, acute or with awn-tipped teeth,  
teeth ± equal, 1/3-1/2 lemma body length; anthers 2.5-3 mm. **FR**

**ERED** CA. Vernal pools;  
laus, Tehama cos.).  
**ER ORCUTT GRASS** Pl gen  
se, sparsely hairy. **ST** gen  
-15(25) cm, often branch-  
-2 mm wide. **INFL** 5-10 cm,  
spikelets ± evenly spaced on axis. **SPIKELET:**  
glumes 3-6 mm, subequal, 3-5-toothed, teeth < 1 mm; florets 5-  
20; lemma 4.5-6 mm, acute or with awn-tipped teeth, teeth ± equal,  
± 1/2 lemma body length, spreading or slightly recurved; palea  
slightly < lemma; anthers ± 3 mm. **FR** ± 3 mm, narrowly oblong.  
2n=26. **ENDANGERED** CA. Vernal pools; 200-1100 m. NCoRI  
(Lake Co), CaRF (Shasta, Tehama cos.).

**O. viscida** (Hoover) Reeder (p. 1279) SACRAMENTO ORCUTT GRASS  
Pl hairy, strongly aromatic, sticky. **ST** erect to spreading with age,  
3-10(15) cm. **LF:** blade 2-4 mm wide. **INFL** 3-5 cm, exserted  
with age; spikelets ± crowded. **SPIKELET:** glumes 5-6 mm, sub-  
equal, unequally 3-toothed, teeth = glume body, awn-tipped; florets  
6-20(30); lemma 6-7 mm, teeth = lemma body, awn-tipped, central  
tooth >> lateral; palea 3/4 to > lemma; anthers ± 2 mm. **FR** ± 2.5  
mm, widely elliptic. 2n=28. **ENDANGERED** CA. Vernal pools;  
< 100 m. ScV (Sacramento Co.). [*O. californica* var. *v.* Hoover]

**ORYZA RICE**

Dieter H. Wilken

Ann, per. **STS** gen solitary, erect. **LVS** cauline; ligule membranous; blade flat to folded. **INFL** panicle-like. **SPIKELET**  
laterally compressed; glumes << floret, scale-like; floret 1, bisexual, breaking above glumes or not; lemma, palea firmly  
membranous; lemma 5-veined, small-pointed or rigidly awned at tip; palea ± = lemma; stamens 6. ± 20 spp.: trop world-  
wide. (Greek: rice) Cult for food. Spikelet also has been interpreted as 1 floret subtended by 2 scale-like, sterile lemmas and  
2 minute, flap-like glumes.

**O. sativa** L. Ann. **ST** 4-15(20) dm. **LF:** sheath gen glabrous;  
ligule 4-10 mm, acute; blade 15-35 cm, 3-11 mm wide, glabrous to  
minutely scabrous. **INFL** 12-25 cm; branches ascending. **SPIKE-**  
**LET** elliptic; glumes equal, ± 3 mm, linear-lanceolate; lemma,

palea 5-7 mm, distally sharp-bristly; lemma small-pointed to  
awned, awn (3)7-20 mm. Wet sites, ditches; < 70 m. GV; to s US,  
Medit; native to se Asia.

**PANICUM MILLET, PANICGRASS**

Robert Webster

Ann, per. **STS** gen erect; internode solid to hollow inside. **LVS** basal and cauline; sheath glabrous or hairy; ligule short-hairy  
or membranous, ciliate, hairs gen > membrane. **INFL** panicle-like, gen open; 1° branches spreading to ascending; 2°  
branches spreading to appressed; spikelets many, 1-2 per node, gen stalked, on one side of axis or not, stalk tip expanded,  
one side concave. **SPIKELET** falling as 1 unit, ± compressed, gen green to purplish; glumes gen unequal, lower gen < up-  
per, free, clasping, upper glume ± = spikelet, membranous, ± thin; florets 2, lower sterile or staminate, lemma texture like  
glumes, upper floret fertile, lemma leathery to hard, firm, gen shiny, smooth to rough, margin inrolled, tip blunt, palea en-  
closed by lemma margin. ± 450 spp.: trop to warm temp, worldwide. (Latin: ancient name for millet) [Spellenberg 1975  
Brittonia 27:87-95] Some spp. cult for food.

1. Lvs of 2 forms, basal < and gen wider than cauline, rosette well developed, gen persistent
2. Spikelet 3-3.5 mm, 1-2 mm wide; upper glume 9-veined, lower glume acuminate ..... *P. oligosanthos* var. *scribnerianum*
- 2' Spikelet 1-2.5 mm, slightly < 1 mm wide; upper glume 7-veined, lower glume acute ..... *P. acuminatum*
3. Lf blade and sheath hairy ..... var. *acuminatum*
- 3' Lf blade and sheath glabrous ..... var. *lindheimeri*
- 1' Lvs gradually reduced upward, basal rosette not well developed ..... *P. hillmanii*
4. Upper floret lemma with crescent-shaped scar at base
- 4' Upper floret lemma not scarred at base
5. Per
6. Spikelet 2.5-3 mm, glabrous; upper floret lemma with flat margin; ligule membranous, ciliate .... *P. antidotale*
- 6' Spikelet 5-7.5 mm, short-hairy; upper floret lemma with inrolled margin; ligule short-hairy .... *P. urvilleanum*
- 5' Ann
7. Spikelet 4.5-5.5 mm; lf base minutely lobed ..... *P. miliaceum*
- 7' Spikelet 2-3.5 mm; lf base not lobed
8. Spikelet axis visible, ± elongated between glumes and between florets; lower glume 1.5-2.5 mm  
..... *P. hirticaule*
- 8' Spikelet axis not elongated, not clearly visible; lower glume 1-1.5 mm
9. Lower glume ± 1/2 spikelet length; ultimate infl branches spreading; st nodes short-hairy ..... *P. capillare*
- 9' Lower glume < 1/3 spikelet length; ultimate infl branches appressed; st nodes glabrous .. *P. dichotomiflorum*