

XYRIS PANACEA (XYRIDACEAE)—A NEW YELLOW-EYED GRASS FROM THE FLORIDA PANHANDLE

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ABSTRACT

A new species of yellow-eyed grass (**Xyris panacea**) from depression ponds in the Big Bend area of the Florida panhandle (USA) is technically described, and comparisons are made to related species.

RESUMEN

Se describe una nueva especie de (**Xyris panacea**) de los estanques de depresiones en el área de Big Bend en la franja de Florida (USA) y se hacen comparaciones con las especies relacionadas.

An intensive plant survey by the senior author of the St. Marks National Wildlife Refuge included discovery of an unusual *Xyris* that in normal years would probably have been accessible only by boat, but the drought for the spring months of 2007 was the most severe on record for the Florida panhandle (USA). This enabled collecting the plants on foot—albeit I was up to my armpits in water on one occasion because at some sites the new *Xyris* grows on floating islands. The species description follows the format and terminology of Kral (2000).

Xyris panacea L.C. Anderson & Kral, sp. nov. (**Figs. 1–2**). TYPE: U.S.A. FLORIDA. Wakulla Co.: St. Marks National Wildlife Refuge, common in mucky substrate and shallow water of “droughted” pond (East Renfro Lake) dominated by *Eleocharis equisetoides* and *Nymphaea odorata* near SE edge of Panacea Field, ca. 1.7 air mi SW of Panacea, Lat. 30.00742 N, Long. 84.42203 W, 23 Aug 2007, L.C. Anderson 23,436 (HOLOTYPE: FSU; ISOTYPES: MO, NY, VDB).

Planta robusta, perennis, caespitosa, 7–10(–13) dm alta. Caules incrassati, varie elongati (basibus in substratio profundo elongati, ramificantes ascendentibus) cum (frequente) ascendentibus aut effusis stolones efferentibus. Folia principalia rigid, disticha, anguste flabellate expansa, ca. 32–45(–50) cm longa, vaginis scaporum longiora; laminae planae vel leviter tortae, 3–5(–8) mm latae, compressae, 1–2.5-plo vaginis breviores, integrae, subtiliter multicostatae, virides; apices gradatim contracti, incurato-acuti; vaginae carinatae, carinibus integris, lateribus leviter multicostatis, glabris, rufobrunneolae aut brunneolae, maringibus integris, scariosis aut dilutis, in laminae gradatim convergentibus, infimis gradatimexpensis, dilute brunneolis, leviter convexis, usque ad 1.5 cm latis. Vaginae scaportum a basin convolutae, acute unicarinatae, lamprobrunneolae, tortae, leviter multicostatae, laminis erectis, planis, usque ad 15 cm longis et 3 mm latis. Scapis gracilices, recti, apicem versus in sectio transversali elliptici, vulgo unicostati, ca. 1 mm crassi. Spicae anguste ovoideae vel agnuste ellipsoideae aut (vulgo) cylindricae, 2–4(–4.5) cm longae, obtusae, multibracteatae, bracteis spirialiter imbricatis, convexis, ecarinatis, late aut anguste obovatis. Bractee steriles plures, fertilibus breviores in eas gradatim transientes, pari infima carinata aut ecarinata, rotundatis. Bractee fertiles late aut anguste obovatae, 7–8 mm longae, rotundatae, lamprobrunneolae, areis dorsalis distinctis, late ovatis pallidis. Sepala lateralia libera, anguste oblanceolata, 7–8 mm longa, pallide brunneola; ala carinali super medium lacerociliata aut piloso ciliata. Laminae petalorum late obovate, 5 mm longae, apice late rotundatae, denticulatae. Staminodia bibrachiata, brachiis longipenicillatis. Antherae oblongae, ca. 2 mm longae, filiis ca. 0.5 mm longis. Capsulae anguste obovoideae, ca. 5 mm longae, dorsaliter convexae. Semina subcylindrica vel irregulariter ellipsoidea, 0.7–0.8 mm longa, translucida, brunneola, longitudinae valde multicostata et subtiliter transversilineata.

Robust, solitary to caespitose perennials 7–10(–13) dm long, the bases typically slightly bulbous, firm, buried in a mucky, often submersed, substratum, thus periodically producing (on larger plants) elongate ascending branches (internodes) and new “rosettes,” the older, more basal nodes producing dense mats of pale, spongy roots, whereas new nodes produce spreading-arching stolons tipped with new plants. Principal leaves subdistichously in narrow fans, ca. 32–45(–50) cm long, longer than the scape sheaths, entire, multicostulate, green proximally shading to red, flat or slightly twisted, 3–5(–8) mm wide, 1–2.5 times shorter than the sheathes, gradually narrowed to incurved-acute tips; sheathes entire, narrowly convex at

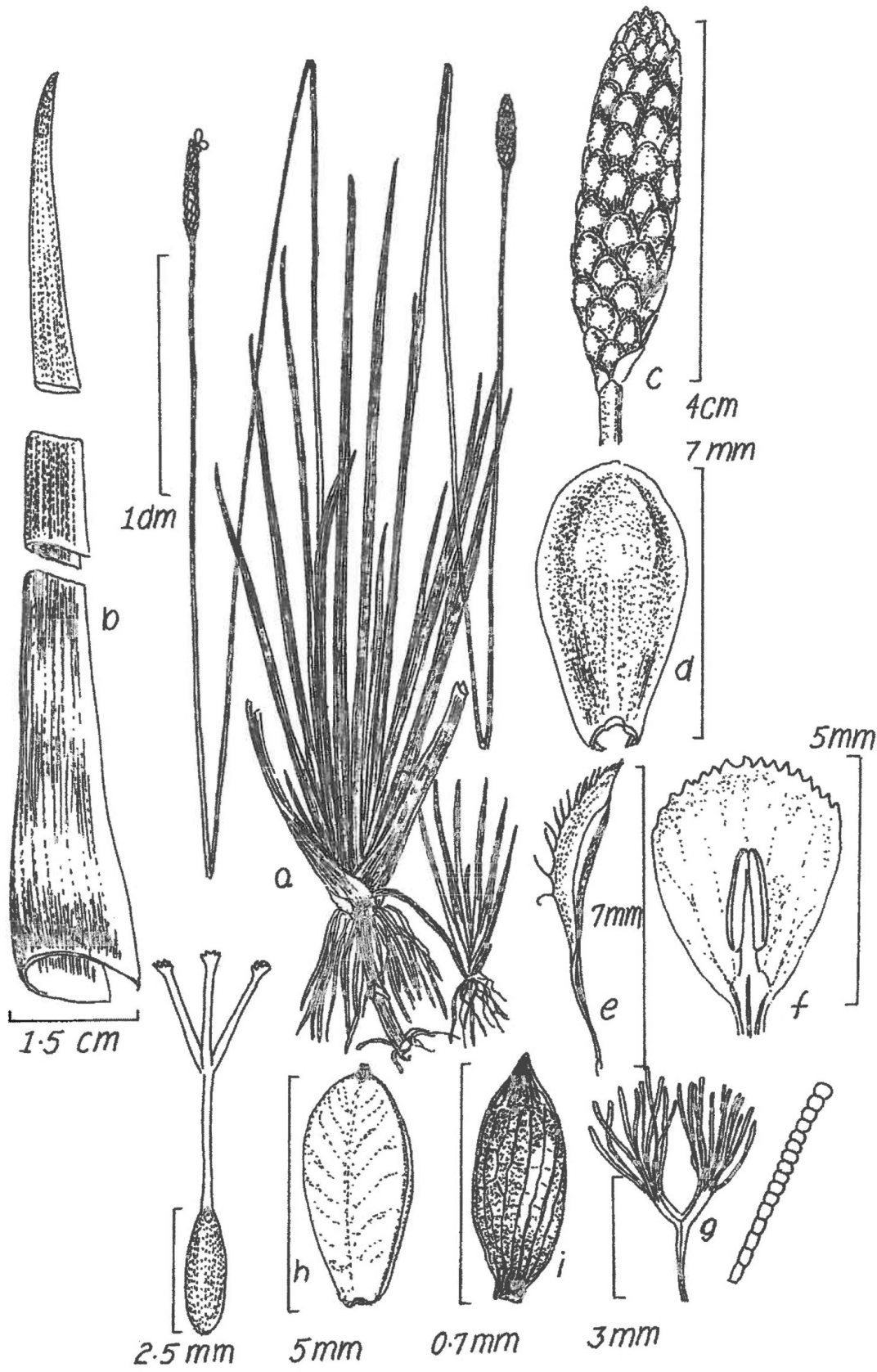


FIG. 1. *Xyris panacea* (Anderson 23438). a. Habit sketch showing vertical rhizome-like stem and stolon. b. Leaf base, mid-sector, and apex. c. Spike. d. Fertile bracts. e. Lateral sepal. f. Petal blade, stamen (measurement taken by Kral from revived material; larger petals and stamens observed by Anderson from fresh material). g. Staminode (left); beard hair (right). h. Capsule (right); gynoecium at anthesis (left). i. Seed.

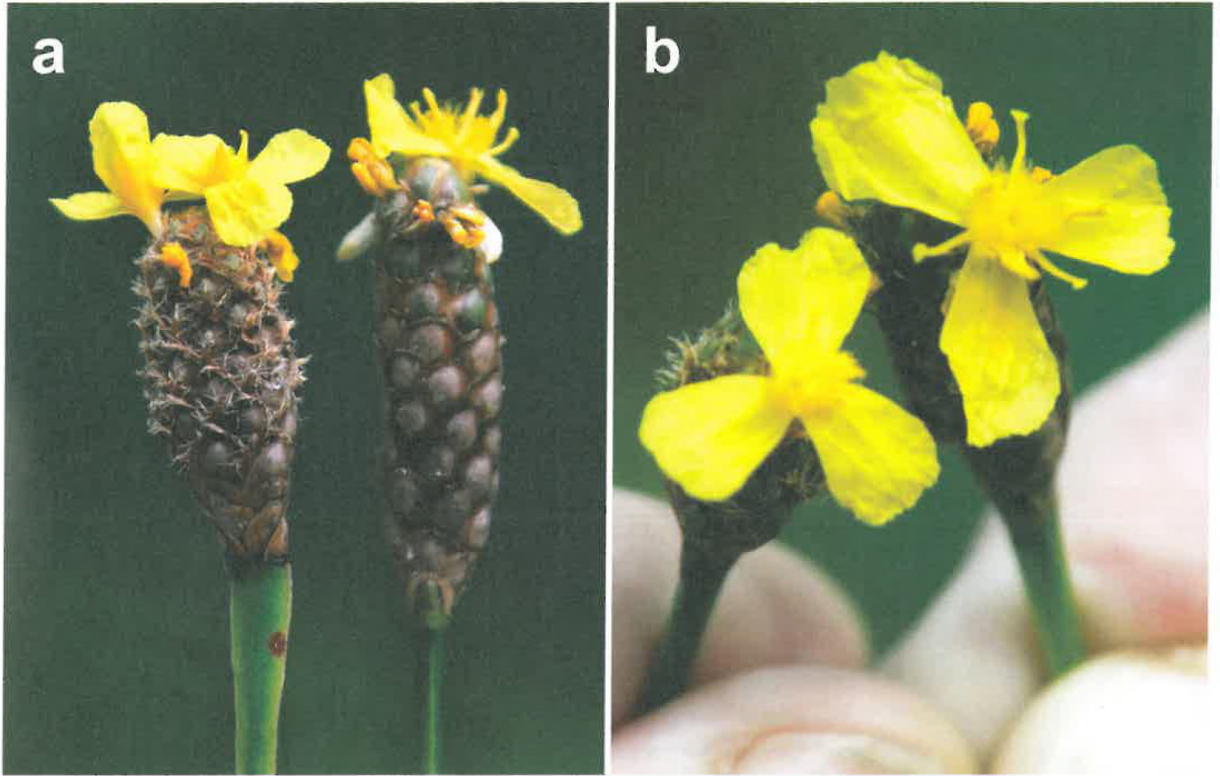


FIG. 2. Comparative digital photographs of *Xyris fimbriata* (Anderson 23476) and *X. panacea* (Anderson 23477) floral features, from transplanted plants. a. Lateral view of spikes and supporting scapes; *X. fimbriata* on left showing scape with scabrid ridges and spike with prominently exserted fimbriate sepals, *X. panacea* on right showing narrower, smooth scape and long, narrowly cylindric spikes with smaller exserted sepals. b. Distal views of flowering spikes; *X. fimbriata* on left with style branches hidden by the staminodia, *X. panacea* on right showing much larger petals and horizontally disposed style branches.

very base, there laterally 1–11.5 cm wide, lustrous dark red aging red-brown or deep brown, distally keeled, gradually narrowing into blade, reddish shading to green, eligulate. Scape sheaths shorter than principal leaves, proximally convolute, sharply keeled, lustrous brown or red-brown, twisted, shallowly multicostate, distally opening to an erect, keeled blade. Scapes slender, erect, 60–115(–130) cm long, red-brown shading to green distally, oval or elliptic in cross-section and 1–1.2 mm wide with one firm, smooth costa. Spikes usually narrowly cylindric, also narrowly ovoid to narrowly ellipsoid, 2–4(–4.5) cm. long, obtuse, multi-bracteate, the bracts imbricate in high spiral, convex, ecarinate (except sometimes with carinate basal pair), broadly to narrowly obovate, entire and distinct dorsal areas. Sterile bracts several, shorter than the fertile and grading into them; fertile bracts 7–8 mm, lustrous dark to pale brown, in contrast to the subapical, broadly ovate to elliptic, gray-brown to dark green dorsal areas. Lateral sepals free, narrowly oblanceolate, 7–8.5 mm long, inequilateral, the keel above middle (often) pilose, thence distally increasingly lacerociliate or pilose-ciliate, with tip acute and slightly to noticeably exserted. Petal blades broadly obovate, 8–9.5 mm long, 6–7 mm wide, apex shallowly rounded, denticulate. Staminodia 3–4.5 mm long, bibrachiate, branches elongate-penicillate. Anthers oblong, 2.5–3 mm long, on stout filaments 0.5–0.8 mm long. Styles 4.5–5 mm long, first ascending, then spreading horizontally between petals with age. Capsules narrowly obovoid, ca. 5 mm long, adaxial side plane, abaxial side convex; placentation 3-parietal. Seeds narrowly to broadly fusiform, 0.7–0.8 mm long, light brown, translucent, longitudinally strongly multiribbed with numerous finer, straight or diagonal connecting lines.

Etymology.—The specific epithet commemorates its geographical area (no curative powers are known).

Common name.—"St. Marks yellow-eyed grass" would be an appropriate common name.

Phenology.—Transplants of all relevant collections were potted in original substrate and cultivated in a flooded wheelbarrow in Anderson's backyard for observation. The new species blooms from late June to early October. Flower buds unfurl and petals are fully expanded around 11:30 am (EDT); in a close associate, *X. fimbriata* Elliott, the flowers open around 1:00 pm and stay open about two hours, whereas those of *X. panacea* remain open until around 4:00 pm. Flowers of *X. smallinana* Nash (in this region) open around 5:00 pm, and their flowering does not overlap with the other species. Flowering observations among the transplants were confirmed in the field.

Habitat.—The Refuge Comprehensive Conservation Plan (U.S. Fish and Wildlife Service 2006) lists ponds in the Panacea unit variously as "coastal depression ponds" or "basin lakes" or "flatwoods lakes." The St. Marks yellow-eyed grass grows either in mucky, loosely matted sandy loam in shallow depression ponds in longleaf pinewoods (with stems bases submerged in 10 or more centimeters of water or in poorly congealed loam of floating islands in those depression ponds (with stem bases only slightly submerged). Some ponds are ringed with a thicket of *Cyrilla racemiflora* L., whereas others are bounded by *Hypericum fasciculatum* Lam. The new species was vouchered from five ponds in the area; it is presumably present in several other ponds that Anderson planned to visit, but his 2007 field season was terminated abruptly with a broken leg.

Associated species.—Frequently seen taxa (other than other *Xyris*) at one or more sites include: *Bacopa caroliniana* (Walter) B.L. Rob., *Burmanniea biflora* L., *Cyrilla racemiflora*, *Decodon verticillatus* (L.) Elliott, *Drosera intermedia* Hayne, *Eleocharis baldwinii* (Torr.) Chapm., *E. elongata* Chapm., *E. equisetoides* (Elliott) Torr., *Eriocaulon compressum* Lam., *Fuirena breviseta* (Cov.) Coville, *F. scirpoidea* Michx., *Habenaria repens* Nuttall, *Hydrocotyle bonariensis* Comm. ex Lam., *Hypericum fasciculatum*, *Lachnanthes carolina* (Lam.) Dandy, *Ludwigia alata* Elliott, *Lycopodiella appressa* (Chapm.) Cranfill, *Mayaca fluviatilis* Aubl., *Myriophyllum laxum* Shuttlew. ex Chapm., *Nuphar advena* (Aiton) W. Aiton ssp. *orbiculata* (Small) Padgett, *Nymphaea odorata* Sol., *Nymphoides aquatica* (J.F. Gmel.) Kuntze, *Panicum verrucosum* Muhl., *Pontederia cordata* L., *Rhynchospora careyana* Fernald, *R. cephalantha* A. Gray, *R. tracyi* Britton, *Sagittaria lancifolia* L., *Scleria reticularis* Michx., *Triadenum virginicum* (L.) Raf., *Utricularia floridana* Nash, *U. juncea* Vahl, and *U. purpurea* Walter.

PARATYPES. Anderson 23,437 (AUA, FLAS, FSU, GA, USF, VDB, VSC), Anderson 23,438 (FLAS, FSU, GA, USCH, USF), R. Kral 98,248 (VDB).

Additional collections (all **FLORIDA. Wakulla Co.:** St. Marks National Wildlife Refuge). East Renfro Lake near type locality, Lat. 30.00754 N, Long. 84.42194 W, 7 Aug 2007, Anderson 23396 (FSU, VDB); "Point 4 Pond" (0.4 mi S of Otter Lake Rd on Refuge Rd 319), Lat. 30.02258 N, Long. 84.40673 W, 4 Sep 2007, Anderson 23473 (FSU); "Point 8 Pond" (0.8 mi S of Otter Lake Rd on Refuge Rd 319), Lat. 30.01715 N, Long. 84.40813 W, 4 Sep 2007, Anderson 23477 (AUA, FSU, VDB); pond W side Rte 372 (opposite Refuge Rd 334), Lat. 30.02234 N, Long. 84.44504 W, 11 Sep 2007, Anderson 23502 (FSU, MO, NY); floating island in North Lake, S of Refuge Rd 329, SW of Otter Lake, Lat. 30.01434 N, Long. 84.42978 W, 25 Sep 2007, Anderson 23595 (FLAS, FSU, FTG, GA, MO, UNA, VSC).

DISCUSSION

The common associate *Xyris* in these ponds is *X. fimbriata*, a species of similar habit and pigmentation but with two scabrid scape costae (rather than a single, smooth one), with spikes mostly shorter and of broader outline, with lateral sepals strongly exserted, their keels densely fimbriate (Fig. 2). Also, a few diminutive flowering plants of *X. jupicai* L. Rich. were seen at the type locality. Ponds 3.8 km and 4.3 km NE of the new taxon's range had the "*X. panacea* zone" replaced with *X. smalliana* exclusively; see Anderson 23456, 23457 (FSU, VDB). In the general area, though not an associate, is *X. stricta* Chapm., another tall species with similarly ascending, long-sheathed, slender-bladed leaves and similar pigmentation. This taxon also has narrowly ellipsoidal to subcylindric spikes with similar design of bracts. However, this taxon has scapes distally broader, flatter, actually 2-edged, its lateral sepals are broader, with broader, firmer, ciliolate keels whose tips are not exserted; its seeds are typically farinose.

The St. Marks yellow-eyed grass is distinctive with a suite of vegetative and floral features. The dark red stem bases are somewhat bulbous and firm (being pale green and soft in *X. fimbriata* or pale green and

mucilaginous in *X. smalliana*); larger plants have stout vertical, rhizome-like stems and more delicate stolons. The flowering scapes are smooth with weakly developed ribs below the spikes. The spikes are cylindric, longer than those of any other taxa in North America (Kral 2000). Flowers open earlier in the day and are larger than those of other species (equally large petals are found in *X. caroliniana* Walter, but that species differs in habitat and very many aspects of morphology). More attention needs to be given to style position amongst North American species; the horizontally spreading style branches in *X. panacea* may be exclusively unique. The known range of the new species is sufficiently small to warrant designating it a threatened or endangered species.

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