

# NOTES ON *CAREX*, *CYPERUS*, AND *KYLLINGA* (CYPERACEAE) IN MISSISSIPPI WITH RECORDS OF EIGHT SPECIES PREVIOUSLY UNREPORTED TO THE STATE

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## ABSTRACT

Field and herbaria explorations have yielded the following as new to Mississippi, U.S.A.: *Carex bicknellii* var. *opaca*, *C. fissa* var. *fissa*, *Cyperus drummondii*, *C. elegans*, *C. entrerianus*, *C. eragrostis*, *C. louisianensis*, and *Kyllinga brevifolioides*. Two of these, *C. entrerianus* and *K. brevifolioides*, have the potential to become threats as pernicious agricultural and lawn weeds, respectively, in the southeastern United States. Additional range extensions are presented for *C. aggregatus*, *C. difformis*, *C. flavicomus*, *C. lancastrensis*, *C. ovatus*, and *C. pilosus* in Mississippi. Locality and habitat data are presented for all species reported.

## RESUMEN

Exploraciones de campo y de herbario han dado los siguientes taxa como nuevos para Mississippi, U.S.A.: *Carex bicknellii* var. *opaca*, *C. fissa* var. *fissa*, *Cyperus drummondii*, *C. elegans*, *C. entrerianus*, *C. eragrostis*, *C. louisianensis* y *Kyllinga brevifolioides*. Dos de éstos, *C. entrerianus* y *K. brevifolioides*, tienen potencial para llegar a ser una amenaza como malas hierbas para la agricultura y los céspedes, respectivamente, en el sudeste de los Estados Unidos. Se presentan ampliaciones de área para *C. aggregatus*, *C. difformis*, *C. flavicomus*, *C. lancastrensis*, *C. ovatus*, y *C. pilosus* en Mississippi. Se presentan datos de localidad y hábitat de todas las especies citadas.

## INTRODUCTION

While continuing to prepare a synoptical treatment of *Carex*, *Cyperus*, and *Kyllinga* as a contribution to the Flora of Mississippi Project, we have examined herbaria specimens and conducted field surveys for species with potential to occur within Mississippi. We have also continued assessment of population size, distribution, and habitat requirements of recently reported species, especially those which have potential to become weedy. This article adds to the knowledge of *Carex*, *Cyperus*, and *Kyllinga* which has been reported in recent years (Bryson 1984a; Bryson & Jones 1990; Bryson et al.

1991; Bryson & Carter 1992; Bryson et al. 1992; Carter et al. 1987; Morris & Bryson 1986; Naczi & Bryson 1990). As we previously discussed, the flora of Mississippi is still poorly known in comparison with several adjacent states. Lowe's *Plants of Mississippi* (1921), although outdated, must continue to serve as a base line for the general floristic work in the state. Other references that we used as sources of distributional data are Mackenzie (1931–1935), Kükenthal (1935–1936), McGivney (1938), Corcoran (1941), Horvat (1941), Radford et al. (1964), and Godfrey & Wooten (1979).

The terminology of physiographic regions or resource areas in Mississippi follows Lowe (1921) as adapted by Morris (1989). Herbarium abbreviations follow Holmgren et al. (1990), except ctb, MMNS, and USMH (personal herbarium of Charles T. Bryson, Mississippi Museum of Natural Science, Jackson, and University of Southern Mississippi, Hattiesburg, respectively).

#### NEW STATE RECORDS

*Carex bicknellii* Britton var. *opaca* F.J. Herm. was described from three collections by Dr. Delzie Demaree from river terraces in Lonoke and Prairie counties, Arkansas (Hermann 1972). In his discussion of this puzzling variety of *C. bicknellii*, Hermann (1972) emphasized its large, nearly nerveless, and partially translucent perigynia and indicated they were similar to perigynia of *C. brittoniana* Bailey and *C. merritt-fernaldii* Mack. as well as *C. bicknellii*. However, the perigynia of *C. bicknellii* var. *opaca* are much larger (5.5–7 mm long, 4–4.75 mm wide) compared to those of *C. merritt-fernaldii* (4–5 mm long, 2.5–3.5 wide). *Carex bicknellii* var. *opaca* differs from the Oklahoma-Texas *C. brittoniana* in usually having 5–7(9) (rarely only 4) spikes per culm; perigynia (2)4–7 nerved (sometimes faintly) over the achene ventrally; and staminate and pistillate scales obtuse to long-acuminate, but with the midrib not excurrent as a scabrous awn (rarely a short mucro present). *Carex brittoniana* has culms with normally (2)3–4(5) spikes; perigynia nerveless over the achene ventrally, or nearly so; and staminate scales (and sometimes the lowermost pistillate scales) with the midrib excurrent as a scabrous awn 0.1–0.9(2.4) mm long. *Carex bicknellii* var. *bicknellii* is a dry prairie species not known from Mississippi. *Carex bicknellii* var. *opaca* was found at the same site in the Black Prairie Region of Mississippi where *C. oklahomensis* Mack. was first collected in the state by the senior author in 1991 (Bryson et al. 1992). It was associated with *C. bushii* Mack., *C. complanata* Torr. & Hook., *C. glaucoidea* Tuckerman, *C. longii* Mack., and *C. vulpinoidea* Michx. The following are data reporting *C. bicknellii* var. *opaca* from Mississippi for the first time.

Voucher specimens: U.S.A. MISSISSIPPI. Lee Co.: E of Tupelo, NE of jct. of hwy US 78 and Auburn Road, 26 May 1993, Bryson 12400 (ctb, IBE, MICH, SWSL).



*Carex fissa* Mack. var. *fissa* is herewith reported new to Mississippi. *Carex fissa* was described by Mackenzie (1931) from specimens collected in eastern Oklahoma where it was believed to be endemic. Kolstad (1986) reported *C. fissa* from southeastern Kansas and eastern Oklahoma. Hermann (1965) described *Carex fissa* var. *aristata* from north central Florida. Jones et al. (1990) reported *C. fissa* new to Texas. The Mississippi collection of *C. fissa* var. *fissa* was found in a wet ditch between old hwy US 78 and railroad tracks in with *C. annectens* Bicknell, *C. triangularis* Boeck., and *C. vulpinoidea* Michx. in the North Central Plateau Region. It is possible that this species may have been introduced into Mississippi by highway or rail traffic. However, its habitat in Mississippi is similar to that in Arkansas, and it is likely that *C. fissa* is native to Mississippi. It is probable that *C. fissa* var. *aristata* will be found in southern Mississippi. The following data report *C. fissa* var. *fissa* new to Mississippi.

Voucher specimens: U.S.A. MISSISSIPPI. Benton Co.: 1.7 mi NW Hickory Flat, 18 May 1990, Bryson 9977A (ctb, IBE, MICH).

*Cyperus drummondii* Torr. & Hook. [= *C. virens* Michx. var. *drummondii* (Torr. & Hook.) Kükenthal] in North America is restricted to the coastal plain and is known from Texas and Louisiana (Denton 1978). Specimens have also been seen from Florida and Georgia (Carter, unpublished data). It is also known from Nicaragua, Jamaica, the Galapagos Islands, Surinam, and Brazil (Denton 1978). Although Denton (1978) considered *C. drummondii* to be a variety of *C. virens* Michx., we think the morphological differences are sufficient for recognition as a species. *Cyperus drummondii* is generally a taller plant with a more compact inflorescence and fewer primary inflorescence bracts, shorter scales, and a greater achene length to scale length ratio. At the site reported here, *C. drummondii* was associated with *C. haspan* L., *C. ovatus* Baldwin, *C. polystachyos* Rottb., *C. strigosus* L., *C. virens*, and *Fimbristylis* spp. in the Coastal Pine Meadows Region. The following are data for the first collection of *C. drummondii* from Mississippi.

Voucher specimens: U.S.A. MISSISSIPPI. Jackson Co.: Moss Point, ditch along W side of hwy MS 63 between Frederick Street and Dr. Martin Luther King Drive, 0.5 mi S Escatawpa River Bridge, 16 Sep 1993, Carter 11315 (ctb, SWSL, VSC).

*Cyperus elegans* L. is known from coastal Texas, Louisiana, and Florida; it has not previously been reported from Mississippi. It is related to *C. oxylepis* Nees ex Steud. and can be distinguished from that species by its black, obovoid achenes (0.7–1.0 mm broad) and grayish brown, semi-translucent scales versus the brown, oblong, ca. 0.5 mm broad achene and golden yellow to orangish scales of *C. oxylepis* (Bryson & Carter 1992). Like *C. oxylepis*, *C. elegans* has a distinctive and pleasantly aromatic fragrance



somewhat like that of cured juniper wood, which can often be detected several meters away from live plants in the field. The authors have on several occasions smelled these species in the field prior to making visual contact. Both species are locally abundant in heavily disturbed fill areas along the coast in Jackson County, Mississippi, and the populations of *C. elegans* and *C. oxylepis* consist of more than 2000 plants each and cover an area greater than 121 ha (300 acres). *Cyperus elegans* was found in association with *C. odoratus* L., *C. oxylepis*, *C. entrerianus* Boeckler, *C. filicinus* Vahl, *C. flavescens* L., *C. surinamensis* Rottb., and *C. virens* in the Coastal Pine Meadows Region. Collection data for *C. elegans* in Mississippi follow.

Collection data. U.S.A. MISSISSIPPI. Harrison Co.: Orange Grove Community Center, 0.3 mi N jct. hwy I-10 and US 49; W of US 49, 16 Oct 1993, Bryson 13160 and Carter (ctb, SWSL, VSC). Jackson Co.: Pascagoula, vicinity of Bayou Casotte, S jct. of Louise and Washington Streets, 9 Aug 1993, Bryson 12595 (ctb, IBE, MICH, VDB, VSC); Carter 11339 (VSC, others to be distributed).

*Cyperus entrerianus* Boeck. is an apparent introduction from South America or Mexico (Carter 1990) and was reported from 21 counties in Georgia, Florida, Alabama, Louisiana, and Texas (Carter 1990; Carter & Jones 1991). Although *C. entrerianus* is not recognized in some floras, it is quite distinct from other taxa in the *Cyperus* section *Luzuloidei* in temperate North America, and a comprehensive discussion and key was provided for this section by Carter (1990). This perennial is a copious producer of seeds and possesses a hard, stout, deeply set rhizome. It seems to be a more aggressive weed than other members of *Cyperus* section *Luzuloidei* that occur in Mississippi (e.g., *C. acuminatus* Torr. & Hook., *C. drummondii*, *C. eragrostis* Lam., *C. pseudovegetus* Steud., *C. surinamensis*, and *C. virens*). *Cyperus entrerianus* is often locally abundant in eastern Texas and southern Louisiana where it seems to be associated with rice production, and it has been found in a rice field in Paraguay (Carter 1990). *Cyperus entrerianus* was found growing in the Coastal Pine Meadows Region with *C. elegans* and its associates listed in the preceding discussion. The following are data for the first collections of *C. entrerianus* in Mississippi.

Voucher specimens: U.S.A. MISSISSIPPI. Jackson Co.: Pascagoula, vicinity of Bayou Casotte, S jct. of Louise and Washington streets, 9 Aug 1993, Bryson 12598 (ctb); 31 Aug 1993, Bryson 12821 and Newton (BRIT/SMU, ctb, DSC, FLAS, FSU, GA, IBE, KNK, MICH, MISS, MISSA, MMNS, MO, NLU, SWSL, TAES, USMH, VDB, VSC, others to be distributed).

*Cyperus eragrostis* Lam. is native to California, Oregon, and Washington in North America; Bolivia, Peru, and Surinam south to Argentina, Brazil, Chile, and Uruguay in South America; and Easter and Juan Fernandez Islands in the Pacific (Denton 1978). This species has not previously



been reported from Mississippi although two specimens collected by Ken Rogers (cited below) were collected in Forrest and Hinds counties in 1971 and 1981, respectively, and determined by R. Kral (VDB) and R. Carter. In Rankin County, collections were made along shallow narrow ditches. These sites are across the Pearl River and within five miles of the earlier Hinds County site of Ken Rogers. The Mississippi plants seem to be intermediate in size between typical *C. eragrostis* var. *eragrostis* and the diminutive form *C. eragrostis* var. *compactus* (Desv.) Kük. Denton (1978) treated *C. eragrostis* var. *compactus* as a synonym of *C. eragrostis* because the diminutive form occurs throughout the range of the species. When transplanted into pots and grown under controlled conditions (i.e., with regular watering and fertilizer) in the greenhouse at the USDA, ARS, Jamie Whitten Delta States Research Center, Stoneville, MS, individuals of *C. eragrostis* from the Rankin County collection produced new stems that were longer than those observed in the field and that were typical of *Cyperus eragrostis* var. *eragrostis*. Thus, it appears periodic mowing of ditches and roadsides apparently caused plants to be shorter than typical for the species in the Rankin County, Mississippi population observed by the senior author. In Rankin County, *C. eragrostis* was associated with *Carex longii*, *Cyperus haspan*, *C. odoratus*, *C. pseudovegetus*, *C. strigosus*, *C. virens*, and *Kyllinga brevifolia* Rottb. [= *Cyperus brevifolius* (Rottb.) Hassk.]. Each of the collections were made in the Longleaf Pine Belt Region. The following data are the first records *C. eragrostis* from Mississippi.

Voucher specimens: U.S.A. MISSISSIPPI. Forrest Co.: Hattiesburg, drainage ditch at Kemper Park, 16 Jul 1971, *Rogers* 6708 (VDB). Hinds Co.: Jackson, Riverside Park, 8 Jun 1981, *Rogers* 46975 (VDB). Rankin Co.: Flowood, 0.3 mi E of Pearl River; S of hwy MS 25, 7 Sep 1993, *Bryson* 12966 (ctb, VSC); *Bryson* 12975 (ctb, SWSL, VSC); Flowood, 0.7 mi E Pearl River; S of hwy MS 25, 14 Oct 1993, *Bryson* 13128 and *Bryson* (ctb, SWSL, VSC).

*Cyperus louisianensis* Thieret was previously reported from only two sites, including the type locality, in Tangipahoa Parish, Louisiana (Thieret 1977). Its lenticular achene and two-branched style place it in subgenus *Pycneus*, and it appears to be closely related to the North American species, *C. diandrus* Torr. (Thieret 1977). The scales of *C. louisianensis* are similar to those of *C. diandrus*, but *C. louisianensis* is distinguished by three stamens and styles that are divided less than half way to the base (Thieret 1977). *Cyperus louisianensis* is also closely related to the widespread old world species, *C. sanguinolentus* Vahl (Thieret 1977). Our observations indicate that *C. louisianensis* is typically found in disturbed habitats, such as road ditches and margins of artificial ponds, where it often forms dense, nearly monotypic, stands. Also, it is found in association with introduced weeds, e.g. *C. pilosus* Vahl (Bryson & Carter 1992) and *Sacciolepis indica* (L.) Chase (Bryson & Lockley 1993), in the Coastal Pine Meadows Region. We have also observed



that *C. louisianensis* flowers and fruits from late August until frost and that it is much more easily detected late in the season when its distinctive reddish scale pigmentation has developed completely. Thus, this may explain why it has been overlooked previously in Mississippi. *Cyperus louisianensis* has been listed as a candidate for protection (U.S. Fish and Wildlife Service 1993). Additional field and herbarium studies by the authors are currently in progress to determine the status of this taxon. The following data are the first records of *C. louisianensis* from Mississippi.

Collection data. U.S.A. MISSISSIPPI. Hancock Co.: W side of hwy MS 43, 0.44 mi N of jct. hwy US 90 and MS 43 in Waveland, 16 Sep 1993, *Carter 11342* (VSC, SWSL, others to be distributed); 16 Oct 1993, *Bryson 13166 and Carter 11545* (ctb, SWSL, VSC, others to be distributed); W of Mill Creek, between Mill Creek and Indian Ridge Road, S of MS 43, ca. 5 mi E jct. hwy MS 43 and I-59 in Picayune, 18 Oct 1993, *Bryson 13265 and Carter 11567* (ctb, SWSL, VSC, others to be distributed); 9.0 mi NW of jct. hwy 43 and 603 in Kiln, at Petroleum Pipeline crossing of hwy MS 43, S side of hwy MS 43, 18 Oct 1993, *Carter 11568 and Bryson* (VSC, others to be distributed); N of Kiln, 0.6 mi S of jct. hwy MS 43 and MS 603, by W side of hwy MS 43, 18 Oct 1993, *Bryson 13267 and Carter 11569* (ctb, SWSL, VSC, others to be distributed); Kiln, beside Shifalo Baptist Church and across hwy MS 43 from Kiln Post Office, by W side of hwy MS 43, 18 Oct 1993, *Bryson 13268 and Carter 11570* (ctb, SWSL, VSC, others to be distributed); SE jct. hwy MS 43 and I-10, 18 Oct 1993, *Bryson 13271 and Carter 11571* (ctb, SWSL, VSC, others to be distributed). Harrison Co.: Orange Grove Community Center, 0.3 mi N jct. hwy I-10 and US 49; W of US 49, 16 Oct 1993, *Bryson 13164 and Carter 11544* (ctb, SWSL, VSC, others to be distributed); Orange Grove, 1.1 mi S jct. hwy US 49 and O'Neal Road, 18 Oct 1993, *Bryson 13276* (ctb, SWSL, VSC, others to be distributed); N Gulfport, 0.3 mi W of jct. of Harrison Drive and 34th Avenue, ditch along Harrison Drive, 18 Oct 1993, *Carter 11574* (VSC, others to be distributed); 3.32 mi W of jct. of Popp's Ferry Road and D'Iberville Boulevard (=hwy MS 67), along Popp's Ferry Road, ca 50 m W of jct. with Camp Four Jacks Road, 18 Oct 1993, *Carter 11577* (VSC, others to be distributed); NW jct. hwy I-10 and US 49, 18 Oct 1993, *Bryson 13279* (ctb, SWSL, VSC, others to be distributed). Jackson Co.: Pascagoula, just SE jct. of Washington and Louise Streets, vic. Bayou Cassotte, 16 Sep 1991, *Bryson 11032 and Newton* (ALA, BRIT/SMU, ctb, DSC, GA, FLAS, FSU, IBE, KNK, MICH, MISS, MISSA, MMNS, MO, NLU, NY, SWSL, TAES, TENN, UARK, US, USMH, VDB, VSC, others to be distributed); 16 Sep 1993, *Carter 11337* (VSC, others to be distributed); St. Martin, 0.2 mi N of jct. of Old Fort Bayou Road and Rosefarm Road, along Rosefarm Road S of creek, 18 Oct 1993, *Carter 11579* (VSC, others to be distributed); vicinity of St. Martin, 1.13 mi W of jct. of Old Fort Bayou Road and Yellow Jacket Boulevard, between Lancaster Road and Mayfair Road, 18 Oct 1993, *Carter 11580* (VSC, others to be distributed); vicinity of St. Martin, 0.19 mi E of jct. of Fort Bayou Road and Yellow Jacket Drive, by Old Fort Bayou Road, 18 Oct 1993, *Carter 11581* (VSC, others to be distributed). Pearl River Co.: Picayune, ca. 250 m N jct. hwy I-59 and MS 43 by frontage road along W side of I-59, 18 Oct 1993, *Bryson 13222 and Carter 11565* (ctb, SWSL, VSC, others to be distributed); Picayune, 0.5 mi W jct. hwy I-59 and MS 43; N of MS 43, 18 Oct 1993, *Bryson 13257 and Carter 11562* (ctb, SWSL, VSC, others to be distributed).

*Kyllinga brevifolioides* (Thieret & Delahoussaye) G.C. Tucker [= *C. brevifolioides* Thieret & Delahoussaye] (Tucker 1984) was cited from Connecticut, North Carolina, Pennsylvania, and Virginia in North America by



Delahoussaye and Thieret (1967) in the original description. Subsequently, it has been reported from Maryland (Sipple 1978; Naczi et al. 1986), Tennessee (Kral 1981; Webb et al. 1981), Alabama and Georgia (Webb et al. 1981), New Jersey (Snyder 1983, 1984), Delaware (Naczi 1984; Naczi et al. 1986), and Arkansas (Sundell & Thomas 1988). Like *K. brevifolia*, *K. brevifolioides* is a rhizomatous perennial; however, it can be separated from *K. brevifolia* by its smooth scale keel and 2–3 stamens versus the denticulate scale keel and a single stamen of *K. brevifolia*. Like *K. brevifolia* and *K. odorata*, *K. brevifolioides* is weedy and was probably introduced from Asia (Ferren and Schuyler 1980; Webb & Dennis 1981). *Kyllinga brevifolia* and *K. brevifolioides* have been observed by the authors to be weeds in periodically wet or frequently irrigated areas of lawns, roadsides, ditches, cemeteries, golf courses, and flower beds, often associated with the following sedges: *Carex longii*, *Cyperus polystachyos*, *C. pseudovegetus*, *C. strigosus*, *Eleocharis obtusa* (Willd.) Schult., and *Kyllinga pumila* Michx. The collections reported herein are from the Loess Bluffs and Tennessee River Hills Regions. The following are data for the first collections of *K. brevifolioides* from Mississippi.

Voucher specimens: U.S.A. MISSISSIPPI. Alcorn Co.: Corinth, S of jct. hwy US 72 and Cass Street, 29 Sep 1993, *Bryson* 13082 (ctb, FSU, IBE, KNK, NYS, SWSL, VDB, VSC); Corinth, SE of jct. hwy US 72 and Harper Road, 29 Sep 1993, *Bryson* 13094 (ctb, IBE, NLU, SWSL, VDB, VSC). De Soto Co.: Olive Branch, 0.3 mi W of jct. hwy US 78 (old) and MS 302 (=Goodman Road); N of Goodman Road, 7 Oct 1993, *Bryson* 13102 and *Bryson* (BRIT/SMU, ctb, DSC, FSU, GA, IBE, KNK, MICH, MISS, MMNS, NLU, SWSL, USMH, VDB, VSC); ca. 0.8 mi N jct of Goodman Road and Getwell Road; W of Getwell Road, 13 Oct 1993, *Bryson* 13124 (ctb, VSC).

#### OTHER NOTEWORTHY COLLECTIONS

*Cyperus aggregatus* (Willd.) Endl. {previously known as *C. huarmensis* (H.B.K.) M.C. Johnst., *C. cayennensis* (Lam.) Britton, and *C. flavus* (Vahl) Nees; see Tucker (1985)} is reported from Florida (Kral 1966; Clewell 1985), Louisiana (Horvat 1941), and Texas (Correll & Johnston 1970). Since it was first discovered in Stone County, Mississippi, in 1991 (Bryson & Carter 1992), *C. aggregatus* has been observed to be an aggressive weed of open sandy hilltops, roadsides, poorly kept lawns, and disturbed vacant lots on coarse sandy soils in similar habitats and often growing in association with *C. croceus* Vahl and *C. retrorsus* Chapman. The number, sizes, and distribution of populations in Mississippi suggest that *C. aggregatus*, if not a native, was introduced many years ago into the Coastal Pine Meadows and Longleaf Pine Belt Regions of Mississippi. The following are additional records of this weedy species, including two new county records.

Voucher specimens: U.S.A. MISSISSIPPI. Forrest Co.: Fruitland Park, E of hwy US 49, 9 Aug 1993, *Bryson* 12580 (ctb, IBE, SWSL, VSC). Harrison Co.: 0.2 mi N of Howison, E of hwy US 49, 9 Aug 1993, *Bryson* 12581 (ctb, IBE, NYS, VSC); Gulfport, vacant lot W



of hwy US 49 between 34th and Madison Streets, 12 Aug 1993, *Bryson* 12664 (ctb, SWSL, VSC). **Stone Co.:** Wiggins, hilltop just NE of jct hwy US 49 and MS 26, 16 Oct 1993, *Carter* 11542 and *Bryson* (VSC, others to be distributed).

*Cyperus difformis* L. ranks as one of the world's worst weeds (Holm et al. 1991) and occurs from Europe, Asia, Central America, North America (Lipscomb 1980), Australia, the Pacific Islands (Kükenthal. 1935), Mexico (McGivney 1938), and South America (S. McDaniel pers. comm.). It is a particularly pernicious annual weed because of its relatively short generation period (as little as 4 to 6 weeks from seed to seed) and high reproductive potential (Holm et al. 1991). This species seems to be spreading in the United States especially along major waterways, through introduction at ports-of-entry, and in rice production in California. In the United States *C. difformis* has been known from Virginia since 1934 and is a troublesome weed of rice in California (Bryson 1984b). It is also known from Alabama (Kral 1973), Florida (Burkhalter 1985), Louisiana (Thieret 1964), Mississippi (Bryson & Carter 1992), Nebraska (Lemaire 1970), North Carolina (Tyndall 1983), Pennsylvania (Smith 1986), Tennessee (Webb & Dennis 1981), and Texas (Carr 1988). During field work in 1993, new populations were discovered, and previously known populations (Bryson & Carter 1992) were observed. Population size, in area covered and number of individuals, had increased by 2- to 400-fold since 1991. The following are data for recently discovered populations of *C. difformis* in Mississippi from the Coastal Pine Meadows and Longleaf Pine Belt Regions.

Voucher specimens: U.S.A. MISSISSIPPI. **Forrest Co.:** Hattiesburg, Alcorn Street between James and Tipton streets, beside Hattiesburg Water Works, 16 Oct 1993, *Bryson* 13148, *Carter and Rosso* (BRIT/SMU, ctb, FSU, IBE, KNK, MISS, MMNS, MO, NLU, NYS, SWSL, TAES, USMH, VDB, VSC). **Hancock Co.:** Kiln, wet ditch W of hwy MS 43, 6 Aug 1992, *Bryson* 11941 (ctb, IBE, VSC). **Harrison Co.:** Gulfport, wet ditch between Seaway Road and RR; S of hwy I-10, 6 Aug 1992, *Bryson* 11993 (ctb, IBE, VSC); Orange Grove, 0.3 mi N jct. hwy I-10 and US 49; W of US 49, 31 Aug 1993, *Bryson* 12805 and *Newton* (ctb). **Jackson Co.:** Moss Point, SE jct. hwy I-10 and MS 63, 31 Aug 1993, *Bryson* 12818 and *Newton* (ctb); Moss Point, NE of jct. hwy US 90 and MS 63, 1 Sep 1993, *Bryson* 12835 and *Newton* (ctb, IBE, NLU, VDB, VSC); Pascagoula, Bayou Casotte area, adjacent to City Animal Shelter just S of S end of Louise Street, 16 Sep 1993, *Carter* 11338 (VSC, others to be distributed).

*Cyperus flavicomus* Michx. (= *C. albomarginatus* Martius & Schrad. ex Nees) was previously known from only Lafayette and Tishomingo counties, both in northeastern Mississippi in the North Central Plateau and Tennessee River Hills Regions. *Cyperus flavicomus* was found growing on wet soil often in shallow standing water in association with *Carex longii*, *Cyperus difformis*, *C. esculentus* L., *C. iria* L., *C. haspan*, *C. odoratus*, *C. pilosus*, *C. polystachyos*, *C. strigosus*, *C. surinamensis*, *C. virens*, *Eleocharis obtusa*, *E. tuberculosa* (Michx.) Roem. & Schult., *Fimbristylis autumnalis* (L.) Roem. and Schult., *F. miliacea*



(L.) Vahl, *Kyllinga brevifolia*, and *Rhynchospora corniculata* (Lam.) Gray. Based on our examination of herbarium specimens and field surveys, *C. flavicomus* seems to occur sporadically throughout much of the southeastern United States. The following are additional county records from the Coastal Pine Meadows Region of southern Mississippi.

Voucher specimens: U.S.A. MISSISSIPPI. Harrison Co.: Orange Grove, 0.3 mi N jct. hwy I-10 and US 49; W of US 49, 31 Aug 1993, *Bryson 12815 and Newton* (ctb, DSC, IBE, MISS, MMNS, MO, NLU, SWSL, USMH, VDB, VSC); *Bryson 13162 and Carter* (ctb, VSC). Jackson Co.: Moss Point, SE of jct. hwy I-10 and MS 63, 31 Aug 1993, *Bryson 12816 and Newton* (ctb).

*Cyperus lancastrensis* Porter in Gray was first reported from Mississippi by Morris (1988) in the North Central Plateau Region. Subsequently, it was reported from Lee and Tishomingo counties in the Tennessee River Hills Region (Bryson & Carter 1992). Following are data from an additional three counties all from northern Mississippi in the North Central Plateau and Tennessee River Hills Region. *Cyperus lancastrensis* was found growing in association with *C. echinatus* (L.) Wood and *C. strigosus* in small damp depressions on open hillsides.

Voucher specimens: U.S.A. MISSISSIPPI. Itawamba Co.: 1.6 mi N Dorsey SW of jct. of hwy US 78 and Fawn Grove exit, 26 Aug 1993, *Bryson 12784* (ctb, VSC). Marshall Co.: N of Galena, jct. of old and new hwy MS 7, 24 Aug 1993, *Bryson 12731* (ctb, IBE, VDB, VSC). Tate Co.: Thyatira, S of hwy MS 4, 7 Oct 1993 *Bryson 13114 and Bryson* (ctb, VSC).

*Cyperus ovatus* Baldwin [= *C. pollardii* Britton in Small] occurs throughout Florida and northward in the outer Atlantic coastal plain into North Carolina and westward along the Gulf Coast into Louisiana (Carter, in prep.). It is related to *C. retrorsus* and is discussed previously from Mississippi (Bryson & Carter 1992). At the time of our previous paper, we were unable to locate *C. ovatus* in Hancock County despite field surveys in suitable habitats (e.g., pond margins, edges of salt marshes, banks of black water streams, and bogs and ditches in pineland savannas). Following are data for additional recent collections of *C. ovatus* from Mississippi in the Coastal Pine Meadows Region.

Voucher specimens: U.S.A. MISSISSIPPI. Hancock Co.: Port Bienville Waterfront Industrial Park, 17 Oct 1993, *Bryson 13182 and Carter 11555* (ctb); Kiln, W of hwy MS 43; across hwy MS 43 from Kiln Post Office, beside Shifalo Baptist Church; ca. 2.0 mi S jct. hwy MS 43 and 603, 18 Oct 1993, *Bryson 13269 and Carter* (ctb).

*Cyperus pilosus* Vahl, a weed of tropical and subtropical regions of Asia, Australia, and West Africa (Kükenthal 1935, McGivney 1938), was apparently introduced into North America from the old world and was first reported in the United States from Tangipahoa Parish, Louisiana, by O'Neill (1938). Subsequently, *C. pilosus* was reported from Florida by Burkhalter



(1985), relocated in Louisiana by Carter (Bryson & Carter 1992), and discovered in Mississippi by Bryson & Carter (1992). In Mississippi, *C. pilosus* was found most frequently growing in disturbed soil at the edge of standing water in ditches, along slow moving streams, and around ponds often in association with many other *Cyperus* species including: *C. difformis*, *C. iria*, *C. louisianensis*, *C. odoratus*, *C. strigosus*, and *C. virens*. The following data report *C. pilosus* from additional counties in Mississippi in the Coastal Pine Meadows Region.

Voucher specimens: U.S.A. MISSISSIPPI. Hancock Co.: SE of Napoleon, in ditch E of jct. hwy I-10 and MS 607; N of I-10, 10 Aug 1993, *Bryson 12606* (ctb, IBE, MO, NLU, SWSL, VDB, VSC); N of Waveland, W of hwy MS 43, 0.44 mi N of jct. hwy US 90 and 43, 16 Sep 1993, *Carter 11346* (VSC). Harrison Co.: Gulfport, ditch between Seaway Road and RR; S of I-10, 6 Aug 1992, *Bryson 11996* (ctb, IBE, MICH, NLU, TENN, VDB, VSC); Gulfport, ditch along Industrial Road, 9 Aug 1993, *Bryson 12582 and Lockley* (ctb); *Bryson 12584* (ctb, IBE, SWSL, VSC); *Bryson 12625* (ctb, IBE, VDB, VSC); Orange Grove Community Center, 0.3 mi N jct. hwy I-10 and US 49; W of US 49, 31 Aug 1993, *Bryson 12813 and Newton* (ctb, VSC); *Bryson 13158 and Carter* (ctb, VSC). Pearl River Co.: Ca. 1 mi S Picayune; ca. 3 mi N Mississippi/Louisiana state line; E of hwy I-59 at Mississippi Welcome Center, 17 Oct 1993, *Bryson 13220 and Carter* (ctb, SWSL, VSC); Picayune, 0.5 mi W jct. hwy I-59 and MS 43; N of MS 43, 18 Oct 1993, *Bryson 13254 and Carter* (ctb, SWSL, VSC).

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