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Nigeria's Sedges: 300 Years of Collecting: 170 Years of Floras

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Abstract

Sedge collecting in Nigeria over 300 years is described, with comments on important and interesting collectors and on the floras documenting their discoveries. In earlier phases activity was largely coastal and along major rivers. Attention spread to other areas after 1900 and by the 1970s the Nigerian sedge flora was reasonably known. Subsequently, additions to Nigeria's list have been few but there has been extensive nomenclatural change, so an updated species list is appended.

Keywords: Nigeria, Floras, Plant collecting history, Cyperaceae, Sedges.

Introduction

In 1974 the University of Ibadan Press published "Flora of Nigeria: Sedges" (Lowe & Stanfield, 1974). I offer a different view of the sedges (Cyperaceae), in the form of a collecting history. Historical treatment of Nigeria's flora has been as general accounts (*e.g.*, Hepper, 1962; Keay, 1962). Treatments of particular plant groups are wanting. Nevertheless, linking collectors' settings to their legacy of material highlights their achievements: in the present case for collectors of sedges.

Emphasis is on how understanding of the group has evolved. The saga spans some 300 years, including the key 60 years when Nigeria emerged as an acknowledged geographic unit and dramatic political and administrative events eclipsed botanical considerations. All sorts of collectors, including a Governor, a bishop, a miner and various surgeons feature among the many individuals playing parts in the story, alongside the usual agriculturalists, foresters and academics. Some experienced unfamiliar and exacting conditions in West Africa and perhaps as many as ten lost their lives. Others, more secure and comfortable in European botanical institutions, made contributions just as vital, sorting and disseminating information through their documents. Mention of these is also made.

This account is presented as a timeline, generally using updated scientific names. The Appendix gives authorities for species names accepted here; other names used in the text are given with authorities. After attention to pre-1800 collecting, five floras chart advance in knowledge. For each flora comments are included on the strengths and weaknesses. Six abbreviations are used: FN, Flora Nigritiana (Bentham, 1849); FTA, Flora of Tropical Africa (Clarke, 1901-2); FWTA1, Flora of West Tropical Africa (Hutchinson & Dalziel, 1936); FWTA2, Flora of West Tropical Africa, Revised Edition (Hooper & Napper, 1972); FNS, Flora of Nigeria: Sedges (Lowe & Stanfield, 1974); WCL, World Checklist of Cyperaceae (Govaerts *et al.*, 2019). FNS remains the most recent comprehensive treatment of Nigeria's sedges but updating is required. Tables, and the Appendix, indicate major differences between FNS and the current (October 2019) version of WCL, and highlight the main taxonomic changes and additions since FNS appeared.

Before 1800: Kirckwood and Palisot

Around ten years Before Linnaeus' birth in 1707, the first botanical sedge specimens were collected from Nigeria. Credit goes to a surgeon - botanical elements of training inspired various surgeons of the 17-19th centuries to collect plants. The individual concerned was Sir John Kirckwood, who would not be the only surgeon collecting Nigerian sedges. Kirckwood's specimens, including species of *Cyperus*, were gathered in 1696-8 at Old Calabar. Originally, they were presented to botanist James Petiver, whose collections were acquired for the Sloane Herbarium, and survive (awaiting authoritative identification) in the London Natural History Museum.

Ninety years later came the tragic Landolphe Expedition, with 250 of 300 men lost within five months of arriving in Warri in 1786 (Keay, 1962). One survivor was the French noble Palisot. From late 1786 to 1788 Palisot sent specimens to Paris but then departed for Haiti seeking recovery from fever leaving other material, destroyed when an English force burned the Warri trading post in 1791. Palisot's absence from France coincided with the French Revolution, delaying return until 1798. Back in France he spent 22 years producing descriptions with illustrations of Warri and Benin plants that had reached Paris (Palisot de Beauvois, 1805-1820). Twelve sedges are illustrated in ten of 120 plates of the "Flore d'Oware et de Benin". The ten, starting with Mirbel's plate of *Cyperus richardii* Fig. 1, were the first botanical drawings of sedges from Nigeria. Despite the limited number of species, Palisot's collections provided insight into the floras of the coast and its hinterland (*Cyperus crassipes, C. obtusatus, C. pedunculatus, Fimbristylis ferruginea*), forest and its margins (*Hypolytrum purpurascens, Rhynchospora corymbosa*), and weeds (*Bulbostylis barbata, Cyperus cyperoides* – Fig. 2, *C. distans*).

To 1849 and the Flora Nigritiana

Attention now briefly moves 950 km north from the coast to Bornu. The Bornu Mission naturalist approaching overland from Tripoli was Walter Oudney, another surgeon. Oudney, in 1822/23, collected two sedges in Bornu: *Cyperus imbricatus* and *Fimbristylis bisumbellata*, the latter typical of northern Nigeria. Oudney died from illness at Katagum in 1824.

Within 20 years attention returns south with the British expedition to the Niger in 1841. The botanist was Theodor Vogel. Vogel maintained informative journals and collected plants up-river to Lokoja, reached mid-September 1841, on steamer Wilberforce. All was not well. After a week he returned to the coast to recover from fever but fared no better than Oudney and died on Bioko three months later.

FN is not a flora in the modern sense. Little comment is provided on each species and it lacks descriptions, illustrations and identification tools. Its superiority over earlier floristic documents was coverage of a vast area of tropical Africa. Its core catalogued plants from the Expedition, together with earlier collections and it includes the first unified list of sedge species (74) known from Senegal south to Angola. Largely thanks to Vogel, material of 15 sedges on Bentham's list, including further material of some of Palisot's discoveries, had originated from Nigeria. Bentham's expression "the River Niger and its branches" for the expedition's target area, emphasizes the southern focus (Oudney's plants were not included).

The era of the Third Niger Expedition and the Flora of Tropical Africa

Government policy overshadowed mid-19th century collecting in Nigeria. Efforts were redoubled against slavery (abolished by Britain from 1834). Missionary activity was encouraged and there was sympathy towards expanding and formalizing commercial activity. This activity in 1854-5 at Abeokuta enabled new collecting. At Abeokuta, the first southern inland settlement away from major waterways, incomers from Britain founded a CMS (Church Missionary Society) Mission and made collections. Surgeon George Irving of the Mission collected seven sedges specimens later listed in FTA, adding the southern *Scleria vogelii* and widespread *Scleria lagoensis* to Nigeria's list. Irving's Yoruba missionary colleague Samuel Crowther now enters the story. In 1822, Crowther had escaped slavery when HMS Myrmidon rescued him from the New World bound Portuguese Esperanza Feliz. Eventually joining CMS, Crowther encouraged cotton-growing and trading alongside Irving. Crowther became the first African to collect a Nigerian sedge specimen, *Bulbostylis barbata*. Kew has Irving's plants but the whereabouts of Crowther's collection (cited in FTA) is unknown. Plant collecting would have been known to Crowther, a missionary veteran of two Niger expeditions (with Vogel on the first, on a second steamer, the Soudan). Crowther (Fig. 3) later rose to eminence, mastering languages along the Niger, translating the Bible into Yoruba and, in 1864, becoming the first ordained African Anglican bishop.

Figure 3. Samuel Ajayi Crowther: in an illustrious career Crowther, who was Yoruba, was a veteran of three missions up the River Niger, became the first African anglican bishop – and was the first African to collect a sedge specimen from what is today's Nigeria.

In 1857 Crowther started his third Niger Expedition. He accompanied one who would add more sedges to the Nigerian list than any other, Charles Barter. This was the final British Government funded Niger Expedition, on the steamer Dayspring (Fig. 4). Unlike Vogel (whose journals reveal his character and underline his achievements and commitment to his task, notwithstanding declining health), about Barter little seems known – apparently not even a portrait (Hepper, 2005)! Sixty years separate the expedition and publication of the only comprehensive account (Hastings, 1926), extracted from the journal of another participant, Lt Glover, Hastings adding a commentary. The expedition leader, William Baikie also collected some sedges along the Niger but is remembered for initiating a quinine regime for the Europeans on the Dayspring (as during his preceding, 1854, expedition in command of the Pleiad, then carrying Crowther as clergyman and main interpreter). Despite Baikie's precaution the Dayspring party suffered worsening health from arrival at the Niger/Benue confluence, after seven weeks in Nigeria.

Further up the River Niger Barter entered Nupe territory where a drama unfolded, starting with the Dayspring's wrecking, destroying collections, on 7 October 1857. It ended with death from illness at Rabba on 15 July 1859. Despite the shipwreck, Barter's time in Nupe, covering dry and rainy seasons, was most productive. Two months with Glover, on a return canoe trip to Bussa preceded a wait, mostly at Rabba, of about 10 months until the river rose

enough for rescue by S.S. Sunbeam. Barter then continued to Bioko and Lagos, but finally returned, via Abeokuta, to Rabba in March 1859. Barter sent over 60 sedge species from Nigeria to Kew where they would later receive attention from Charles Clarke. Clarke himself lost several thousand specimens from a sinking boat in Bangladesh (1868); he must have sympathised with Barter. Over 50 of Barter's species were first collections from the botanically unknown savannas west of the Niger/Benue confluence. He collected types of seven species, adding *Afrotrilepis* and *Diplacrum* to Nigeria's list.

Most sedges Barter collected in Nigeria have proved widespread. Half reach other continents; almost all the rest have wide African distributions. Three merit special mention. *Afrotrilepis pilosa*, a mat-forming plant with branching stems, typical of inselbergs in regions with a marked dry season, Barter collected from "high rocks where water stands during the rains". Kew's experts considered this curious, including it ("*Eriospora pilosa* (Boeckeler) Benth.". Plate 1342) in "Hooker's Icones Plantarum" (Bentham, 1881). Only five sedges, none of African origin, were among over 1300 species previously illustrated in this acclaimed series.

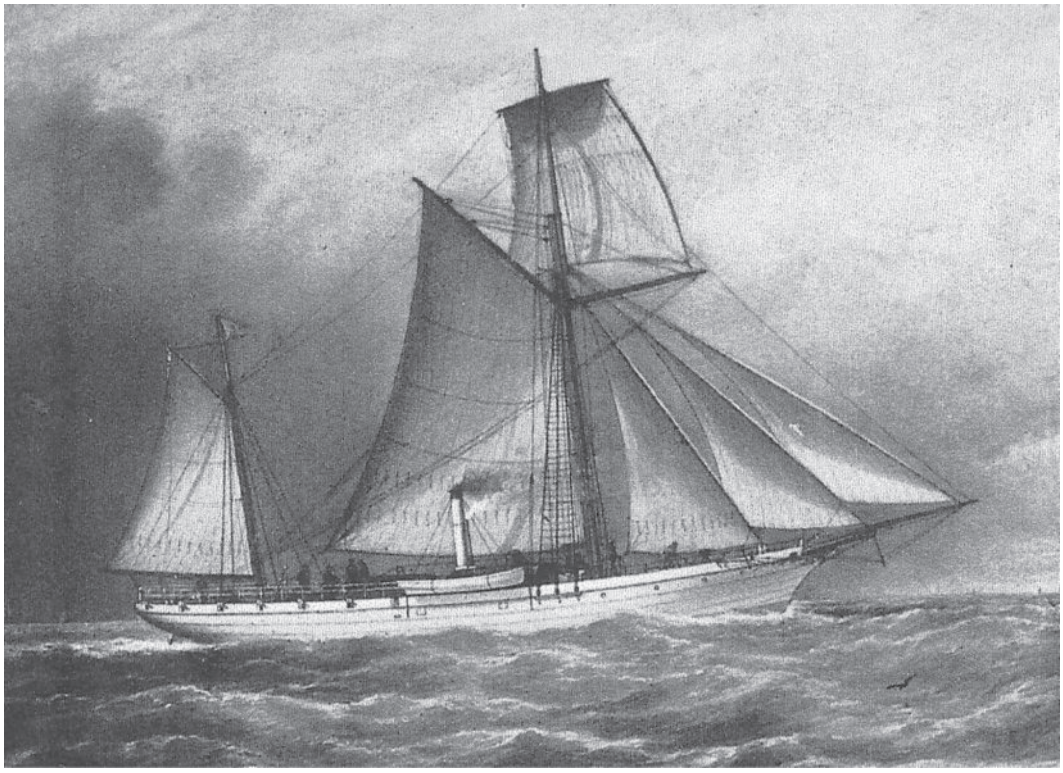

Figure 4. The S.S. Dayspring – this vessel carried Charles Barter and Samuel Ajayi (later Bishop) Crowther up the River Niger to Rabba, where it was wrecked on 7 October 1857. Pieces of Dayspring wreckage were displayed on Jebba Railway Station for many years.

Sadly, the collection, Barter 1560, was cited as "Butler 1560"; somewhere in publication the tag was corrupted! Later, *Afrotrilepis* proved even more remarkable as a resurrection plant. "Resurrection" describes dormant leaves after losing 90% of their moisture and visible chlorophyll reactivating in a new moist period. The second oddity, *Scleria secans* ("*Scleria barteri* Boeckeler") featured in Icones 50 years after *Afrotrilepis* (Hutchinson, 1933). *Scleria secans*, with common names such as "bush razor" or "razor grass" is almost unique - a sedge with branching stems to 9 m. Stem-angles, and leaf margins and midribs, carry minute, sharp recurved hooks. Barter's comment on this species (at Onitsha) was "rendering passage impossible". Since Barter, many working in Nigerian forest expressed similar sentiments (not always tactfully!). The third species is the famous *Cyperus papyrus* (the Papyrus of ancient Egypt), forming pure stands to 5 m in height, and extensive floating mats or islands. A previous collection from West Africa (Bentham, 1849) was by horticulturist Don from "banks of the Lagos, a river near Accra". Barter collected this at Nigeria's Lagos. Mysteriously, neither the standard current flora (Hooper & Napper, 1972) nor WCL records any Ghana occurrence. Don visited today's Ghana but not Nigeria (Hepper & Neate, 1974).

Barter's appointed successor was Gustav Mann, pioneer of botanical work on Mount Cameroon and Bioko, who collected some sedges in Nigeria (mainly from the Niger Delta) before return to Europe (1862), ending British Niger exploration. Mann found the attractive forest sedge *Cyperus fertilis*, anomalous in white inflorescences and wide leaves in rosettes, at Calabar.

Some years followed Irving, Crowther, Barter and Mann before more sedge collecting of note; and during these, for good or ill, Britain's influence greatly intensified. Consular presence from 1852 evolved into a colonial situation as the 1884-5 Berlin Conference approached, precipitating the infamous scramble for Africa. By the time of Clarke's FTA sedge treatment, Lagos Colony was the Protectorate of Southern Nigeria. Some recruited to work there as British administration officials collected plants reaching Kew, including the maritime *Cyperus ligularis* and other southern species (*Cyperus buchholzii*, *C. odoratus*, *C. tenuis*, *Scleria verrucosa*).

FTA was a sophisticated and authoritative work. Dichotomous identification keys covered all species and full descriptions by specialists were provided. There were references to earlier published comment and synonyms and overall distribution, but not illustrations or habitat information.

FTA required a geographical framework for the plants included. When the first FTA volume was published (1868), six "principal geographical regions" were differentiated. Subdivisions were vague and remained so to the volume including the sedges. With refined descriptions from 1898, the six regions were used until FTA closed in 1937. Modern Nigeria straddles two: south is "Upper Guinea"; north is "North Central". After 1898 a standard locality map was adopted - the "Spezialkarte von Afrika" (Fig. 5), produced by Justus Perthes (Habenicht, 1887). From 1903, familiar country names were introduced, Northern Nigeria and Southern Nigeria among

them. Clarke's FTA sedge treatment pre-dated use of these names but Nigerian source areas in the Upper Guinea and North Central regions are easily identified. The prevalence of collections from fairly accurately positioned expedition localities, or along the coast, enables this.

Clarke was a political economist and educationalist of repute and a botanist of high standing. His account, compiled late in the 19th century, remains the principal sedge treatment for 30-40% of tropical Africa over a century later. Clarke listed over 150 sedge specimens from Nigeria, most of the material at his disposal; only around 40 were collected after 1860. Reflecting collecting area accessibility, bias towards River Niger localities, including branches and delta, showed Europe's ignorance of other areas. From the "North Central" region Clarke cites only seven specimens. Two were those of Oudney, the others Eduard Vogel's from Bornu, 1854-5. Eduard, Theodor's brother, was sent from Britain to supply Heinrich Barth, who started overland from the Mediterranean four years before. Eduard's sedges included the northern *Cyperus clavinux* (his collection is the type) and the strictly African but widespread *C. dilatatus*. Unfortunately, Eduard Vogel was assassinated at Wara, Chad, May 1856.

Another century: the Flora of West Tropical Africa

Legacies of the Berlin Conference were administrative and political changes through the 1890s. Consolidation of the British sphere of interest in the Bight of Benin was fixed through treaties

Figure 5. A small part of Habenicht's map of Africa, from sheets printed in 1887. The area includes what is now 'Nigeria' but this name did not come into use for another ten years. This is the map used by the *Flora of Tropical Africa* from 1898 as its standard locality map.

with Germany and France from 1885 to 1913. In 1900 the names Southern Nigeria, east of Lagos Colony, and Northern Nigeria were introduced, too late for Clarke's account (already "in press"). "Nigeria" was suggested three years earlier, by journalist Flora Shaw (future wife of Frederick Lugard, High Commissioner, Protectorate of Southern Nigeria). Southern Nigeria absorbed Lagos Colony in 1906; North and South together became the Colony and Protectorate of Nigeria in 1914.

Initially, in terms of sedge collecting, change in the 20th century was slow. In the interior, local leaders gradually accepted postings of British officials. These included foresters investigating terrain beyond settlements. Thanks to them refinements to Nigeria's list soon reinforced north-south differences in the flora. Three additions from this period are examples. Near Lake Chad, in Lugard's retinue, William Elliott, the first northern forest officer, added the northern *Cyperus laevigatus* to the Bornu flora in 1904. Soon after, at Oban, District Officer Amaury Talbot collected *Diplacrum capitatum*, an elusive southern swampy-forest margin species, and *Mapania amplivaginata* (Fig. 6). Talbot, with wife Dorothy, an accomplished artist, organized a Lake Chad expedition for the intrepid Olive Macleod, acting as escorts at the request of Olive's parents, overcoming official pressure to block travel into "unsafe" regions. Olive wanted to install a headstone at her fiancé's Lake Chad grave (he, Boyd Alexander, was killed near where Eduard Vogel died). Her success and safe return to Britain rebuffed persistent rumours of her death. Olive arguably qualifies as the last "heroic" collector in Nigeria. She was the first woman named as collecting (1910-11) a sedge specimen from Nigeria. No Macleod sedge is cited in FWTA1 but her book's appendix (Macleod, 1912) lists twelve species, mostly weedy, previously known from Nigeria. Her *Cyperus papyrus* from Lake Chad was the first report from northern Nigeria supported by a botanical specimen.

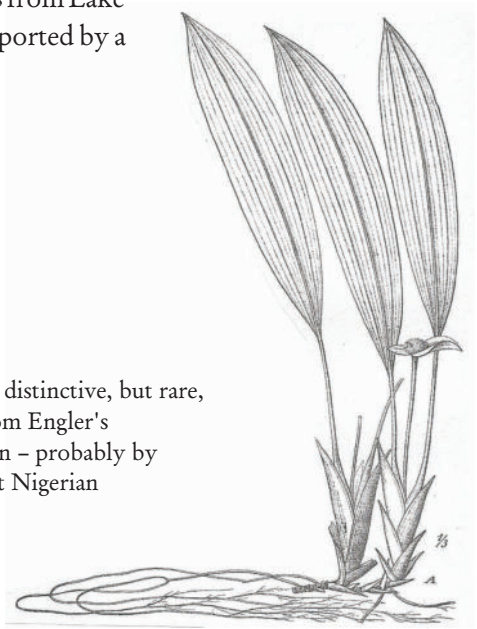

Figure 6. *Mapania amplivaginata*, a highly characteristic and distinctive, but rare, Africa endemic species of deep forest shade: this drawing from Engler's *Die Pflanzenwelt Afrikas* was based on a Cameroun collection – probably by Paul Preuss in about 1890. Amaury Talbot collected the first Nigerian specimen at Oban in 1911.

Before Macleod's visit John Dalziel had arrived in Nigeria. For 17 years from 1905, medical doctor Dalziel worked in Nigerian forestry. Most of over 1000 African collections were from Nigeria. Over 75 Dalziel Nigeria collections were sedges; he added 11 species to Nigeria's list, including the first collections of *Schoenoplectiella* (*S. articulata*, *S. lateriflora*).

As the limitations of FTA became apparent, botanists associated with West Africa envisaged a regional successor. In 1922 the Colonial Office accepted the idea, tasking it to John Hutchinson with John Dalziel appointed assistant. Fourteen years later FWTA1's sedge treatment appeared. Gone was the lavish approach of FTA. Although FWTA1 received much less support, rapid completion was demanded and corners cut. Anticipating use alongside FTA, descriptions were sacrificed, along with much synonymy and many references. Pressure for brevity meant limiting specimen citations; sometimes localities were omitted. Distribution information was greatly simplified for many species. Lost with this austerity was the specialist contributor, Hutchinson and Dalziel addressing most groups. More positively, FWTA1 included seven sedge illustrations, each of a different genus, by Stella Ross Craig and William Trevithick. Three (*Cyperus articulatus*, *Hypolytrum purpurascens*, *Rhynchospora corymbosa*) had been illustrated previously by Palisot. After FWTA1 appeared, Dalziel's appendix on "useful" plants, with a dozen sedges from Nigeria, ended the project (Dalziel, 1937).

During Dalziel's service a far-reaching transport infrastructure developed. As colonial administration spread through the north, interest in mineral resources emerged. Geologists followed the first administrators to identify mining interests, particularly with tin. The geologists penetrated the terrain north of the Benue and, mining and forestry being complementary, by the 1920s both reached the Jos Plateau. In 1911, geologist Falconer referred to "the mysterious Bauchi [Jos] plateau", reflecting near-inaccessibility to Europeans just a few years before. Plant collections from the Plateau and neighbourhood were first made in 1921, finally revealing an upland element in Nigeria's flora. Upland plants included four sedges found by Hugh Lely and Lt.-Col. Dent Young. Lely was a prominent forester, well-respected for a tree manual (Lely, 1925). He collected several hundred plants (Hutchinson, 1921), at least 35 being sedge species (eight newly recorded for Nigeria). Lely's upland sedges were *Cyperus melanospermus*, *C. persquarrosus* and *Scleria woodii*. Dent Young, whose sedge collections included a fourth upland species, *Cyperus angolensis*, was a mine engineer and later managing director. A capable ornithologist, he is remembered for reporting Nok artefacts 1500-3500 years old, unearthed in 1928 during tin-mining activity 100-150 km west of the Jos Plateau.

The most extraordinary sedge addition to Nigeria's list, made in 1934, remains enigmatic. *Microdracoides squamosus* (Fig. 7) was found on Boki (Boji) Hill, north of Afi River, Ogoja Province, by forest officer R D Catteral, while preparing the Afi River Forest Reserve management plan; it has not been re-collected in Nigeria. Known in the Mamfe area of Cameroon 70 km to the south-east and over 2000 km further west, in Sierra Leone and Guinea,

the monospecific *Microdracoides* is anomalous. It is shrubby, to 1.5 m high with a 7 cm diameter trunk and living foliage in dense branch end spirals. Individuals are either male or female. A rather distant relative of *Afrotrilepis*, it shares resurrection qualities.

Figure 7. The bizarre and elusive Africa endemic *Microdracoides squamosus* (female plant), photographed by Joyce Lowe to the east of Yaoundé in Cameroun. Catterall's 1934 collection from the Afi River Forest Reserve remains the only Nigerian record!

FWTA1 cites about 320 specimens of sedges from Nigeria, including about 120 collections (some re-named) cited in FTA. Forty further species were reported. This low number is tribute to the rigour of the botanists of the previous century but also reflects prevalence of widely distributed species. Some cited material was collected before 1902 but omitted from FTA due to late availability, naming uncertainty or oversight. FTA cites no collection of Thomas Dawodu (after Crowther the next Nigerian national to collect any sedge), Assistant Curator, Lagos Botanic Garden. Four Dawodu collections are cited in FWTA1. Were others attributed to William MacGregor, the botanically-inclined Lagos Governor, who communicated Dawodu's material to Kew? FWTA1 credits MacGregor with 17 sedge collections; Kew has material of further species. Five FTA and a FWTA1 collection labelled "Lagos Govt" could be Dawodu's.

Mid-20th century: the revised Flora of West Tropical Africa

With all Nigeria easily reached, a growing collecting fraternity became active. Opportunities for private individuals in Nigeria to explore its culture and environment led to the Nigerian Field Society forming in 1930 and *The Nigerian Field* journal launching a year later. Even before World War II, a sedge (predictably *Cyperus papyrus*) was mentioned in the journal. Post-war, botanical material was flooding the taxonomists, exposing shortcomings in identification literature. In 1951 came the decision to revise FWTA1. FWTA2 would result. Format was similar but, at least for sedges, with more comprehensive synonymy and literature references. Habitat comment was more consistent and four new drawings of Nigerian species (by Elsie Margaret Stones and Dorothy R. Thompson) appeared. Straightforward revision was anticipated, at a modest cost borne by the West African commonwealth territories. Technical responsibility lay with Ronald Keay, seconded to Kew for two years from the Nigeria Forest Service. The task was underestimated: Keay's involvement lasted four years and completion 17 more.

Surprisingly, FTA again was to underpin the revision, to minimise input from specialist taxonomists. The idea was quickly dropped: FTA was hopelessly obsolete, so specialists would have to be involved for many groups. Nowhere did this apply more than for sedges. Comparing FWTA1 and FWTA2 treatments reveals more change than for any other family. So much change was needed that slow progress of sedge revision delayed FWTA2 completion by some three years, even with two specialists.

The specialists were Sheila Hooper and Diana Napper and *Cyperus* their main challenge. Notorious for name instability, *Cyperus* has a long-standing reputation as problematic. For FWTA1 neither Dalziel nor Hutchinson was comfortable with plants of this group; they recruited Eileen Bruce to contribute a *Cyperus* account, and Brian Burtt to help with *Pycreus* (then separately treated). In FWTA1, 51 species were listed under *Cyperus* for West Africa; in FWTA2 the number rose to 67 due to new records and taxonomic revision. Credit for taxonomic advances goes to German cleric Georg Kükenthal, whose impressive, broadly

interpreted, treatment of *Cyperus* appeared 30 years after Clarke's death (Kükenthal, 1935-6). Half the 100 or so collections of *Cyperus* (in Kükenthal's broad sense) cited in both FWTA1 and FWTA2 were re-named in the latter.

Kükenthal's work, covering over 600 species worldwide, remains the definitive account of this significant complex of plants. Clarke divided it into nine segregate genera; for West Africa most are still accepted as valid. Sedge specialists, however, adopt Kükenthal's understanding, recognizing a broader *Cyperus*, which recent genome work widens further (Bauters *et al.*, 2014; Larridon *et al.*, 2014).

In FWTA2, despite limiting citations per taxon per geographic unit to five (ten for Southern and Northern Nigeria together), over 1000 sedge collections from Nigeria are listed. About 230 were included in earlier floras, some 50 pre-dating 1936 but not previously cited. There are around 750 collections cited from 1936-Over 100 collectors, more than 70 active after 1936, gathered these collections but ten or fewer are mentioned for most individuals. The material was mainly from a handful of collectors who had a particular interest in sedges (academics Wheeler Haines, Kenneth Kershaw), or in pastures (Derek Clayton, Paul Tuley), or were foresters surveying vegetation (Ronald Keay, Charles Onochie).

The establishment of institutional herbaria run by taxonomists – particularly the Forest Herbarium, Ibadan (inaugurated in 1942 - Jones, 1947) inspired collecting. Another influence was the drive for more intensive and thorough field studies, when attention extended to plants most collectors once neglected. Four sedge genera came to light through these studies: *Carex* (1962), *Coleochloa* (1969), *Isolepis* (1970) and *Nemum* (1948). Also, baffling material collected by Lely was found to match specimens collected from 1947 by Keay and others, and confirmed as *Schoenoplectiella* and *Schoenoplectus*.

Most ecological work noted sedges as records in vegetation survey, though voucher specimens collected were not always named when survey accounts were prepared. In the north, the survey of Anara Forest Reserve (Keay, 1960) yielded Nigerian specimens of *Cyperus leptorhachis* and *Schoenoplectiella oxyjulos*. A southern example is the Idanre Hills study (Richards, 1957), yielding the first Nigeria collections of *Fimbristylis alboviridis* and *Nemum spadiceum*.

For Nigeria, FWTA2 lists 83 more sedge species than FWTA1 (Hepper, 1972). Additions were not uniformly distributed ecologically. Five broad distributional patterns arise: climatically and geologically widespread; climatically restricted; associated with terrain rich in rock exposures; maritime tendency; high elevation (Hall, 1973). FWTA2 revealed a few more species displaying the first three patterns, no change for the fourth, and a five-fold increase in the high elevation group. Around 40 species added were of northern or eastern distribution, plants with the latter tendency high elevation species. The mountain massifs drew various collectors in this period and, with around 30 characteristic species a rich upland sedge flora was confirmed.

FWTA2 proved of significance far beyond West Africa because of updated taxonomy and including many pan-African and pluricontinental taxa. Kükenthal's achievement with *Cyperus* was part of this updated taxonomy but other taxonomists also contributed to the understanding of African sedges in FWTA2. Ernest Nelmes, Kew's sedge specialist 1933-58, revised for Africa the forest genus *Hypolytrum*, and significantly *Scleria*, building on Pierre Piérart's Congo work. Before FWTA2 was published, accounts of Sudan Cyperaceae (Andrews, 1956, mainly by Nelmes) and East Africa's Cyperaceae (Napper, 1963-71) were the only national/regional treatments of sedges for tropical Africa since Kükenthal's *Cyperus* revision.

From regional to national: the Flora of Nigeria

The idea of a national flora came with independence. Agriculture and forestry flourished and interest in the country's plants was growing. Soon after independence, a "Permanent Committee for the Flora of Nigeria" was established. The flora was never finished but the Cyperaceae account was published – as FNS. FNS differed significantly from other treatments of Nigeria's sedges. Kew played no controlling role, as it had with FTA, FWTA1 and FWTA2, though opportunities for FNS' authors to access Kew's herbarium and consult its specialists were crucial.

Previous floras assumed botanically trained users but FNS was for anyone interested in plants and offered descriptions and special identification keys. Descriptions avoided technicalities and over half of the species were drawn (by Joyce Lowe). Every genus was in the drawings. Identification involved a scoring process; characteristics were scored as positive or negative and shortlists of names suggested by the score combinations resulted. Choosing names within a shortlist followed consideration of descriptions and illustrations. Five characteristics were scored to distinguish genera; two to four to distinguish species.

FNS quickly followed FWTA2, using the same nomenclature. A single localized collection was cited for each taxon but in-country distribution was comprehensively addressed as listed administrative provinces of occurrence. However, distribution details often remained sketchy, around 80 species being recorded from only one or two of 33 provinces in Nigeria when it was written.

For West Africa FNS was a pioneer complementing FWTA2 rather than replacing it. Elsewhere in West Africa, despite FWTA2 stimulus, delays before comparable national treatments appeared (Scholz & Scholz, 1983; Berghen, 1988) were long. In the interim, with many Nigerian species ranging widely, FNS was useful regionally. Beyond West Africa and East Africa, North-east Africa (except Sudan), would wait over 20 years for any equivalent; central/southern tropical Africa waited longer!

The World Checklist

WCL appeared in 2007 (Govaerts & Simpson, 2007) under a scheme launched ten years before for generating world plant checklists. It brought a new era of documentation on sedges. Since, the hard copy account has evolved to an on-going database, kept current. Features are emphasis on nomenclature and global distribution in terms of Levels 2 and 3 of the International Working Group on Taxonomic Databases for Plant Sciences (TDWG) scheme. Beyond brief remarks on life-form descriptive content is absent; there are no illustrations, identification keys or habitat comments. No collections are cited. Its strength and importance lie in name uniformity across Level 3 units (for Africa, effectively countries), enabling robust between-country comparison. The continual updating ensures swift detection and correction of errors, and taxonomic advances can be adopted with ease. WCL compilers accept that views on taxonomic acceptability vary among researchers; in the present study alternatives to WCL positions have sometimes been preferred.

WCL reflects the implications of recent taxonomic progress on understanding sedge floras. Here, it is relevant after over 40 years to ask how the FNS position compares with WCL's currently accepted taxonomy and geographic ranges. Each of the 233 species reported in FNS is referred to a group based on the status of the name (Table 1). The numerous name changes underline the impact of 21st century molecular work on the sedge taxonomy developed through the previous century. Most changes arise from absorption into *Cyperus* of *Ascolepis*, *Kyllinga*, *Lipocarpha*, *Mariscus* and *Pycreus*, and the redistribution of all FNS *Scirpus* species among *Cyperus*, *Isolepis*, *Nemum*, *Schoenoplectiella* and *Schoenoplectus*. Inclusion in FNS of eight species not listed for Nigeria even four decades later by WCL indicates that the WCL set of records by TDWG Level 3 unit occurrences is far from complete.

Table 1. A nomenclature comparison of Flora of Nigeria, Sedges (FNS) with World Checklist of Cyperaceae (WCL)*.

Name Status	Count	(%)
FNS species under the same name in WCL	121	(52)
FNS species for which WCL uses a different name	89	(38)
FNS species which have lost separate identity and are combined with another species under a different name in WCL	15	(7)
FNS species not listed for Nigeria in WCL	8	(3)
Total	**233**	**(100)**

*as of 19 October 2019

A tabulated timeline and comparison of the later lists

Table 2 summarizes what the five floras include. Palisot's findings and the WCL listing of 19 October 2019 are added. The checklist of Ayodele & Yong-Yang (2012) is also included. The table uses genera as currently understood and names used in original sources are updated. The final column shows species numbers accepted here.

The two serious plant collectors to 1850, Palisot and Theodor Vogel, generated a fragmentary picture. This hints that *Cyperus* is well-represented but omits most genera now known to occur. Only one of 22 currently accepted species of *Cyperus* section *Pycreus* had been collected and no material of *Scleria*. Most *Pycreus* are plants of moist conditions; their poor representation is surprising. The absence of *Scleria* reflects the overwhelmingly southern sources of early collections and restriction of activity to watersides.

Table 2. Timeline of floras showing numbers of species recorded for Nigeria listed under currently accepted genera

	A	B	C	D	E	F	G	H	I
Afrotrilepis			1	1	1	1	1	1	1
Bulbostylis	1	3	9	9	15	16	16	15	16
Carex					2	3	4	2	4
Cladium								1	1
Coleochloa					1	1	1	1	1
Cyperus	8	7	56	71	109	113	113	119	117
Diplacrum			1	2	2	2	2	2	2
Eleocharis		1	3	4	12	12	12	12	12
Fimbristylis	2	3	8	10	17	19	19	19	19
Fuirena		1	3	4	5	5	5	4	5
Hypolytrum	1		2	2	2	2	2	2	2
Isolepis					1	1	1	1	1
Mapania				1	2	2	3	2	2
Microdracoides				1	1	1	1	1	1
Nemum					2	1	1	2	2
Rhynchospora	1		3	5	8	8	9	8	10
Schoenoplectiella				4	8	8	8	10	9
Schoenoplectus					1	1	1	2	1
Scleria			9	16	24	24	25	24	26
TOTAL GENERA	5	5	10	13	18	18	18	19	19
TOTAL SPECIES	13	15	95	130	213	220	224	228	232

Sources: A, Palisot de Beauvois (1805-20); B, Bentham (1849); C, Clarke (1901-2); D, Hutchinson & Dalziel (1936); E, Hooper & Napper (1972): F, Lowe & Stanfield (1974); G, Ayodele & Yong Yang (2012); H, Govaerts *et al.* (2019); I, accepted here.

FTA, including over 90 species accepted today, presented a six-fold increase on its predecessor in the species numbers. Doubts about *Cyperus* dominance are dispelled. *Bulbostylis* and *Fimbristylis* emerge as relatively well represented, with *Scleria* equally prominent; the four genera richest in species were known. An improving picture was developing but for huge areas no information existed and nine genera awaited discovery. FWTA1 included 130 of the species accepted today. Ranking of the four prominent genera was underlined and numbers in other genera had risen. There were significant additional genera, notably the specialized *Mapania* and *Microdracoides* but also *Schoenoplectiella*.

FWTA2 added another 80 species, with sharp increases in *Eleocharis* (4 to 12) and Section *Pycreus* of *Cyperus* (7 to 20), and eight genera. FWTA2 comprehensively covers the Nigerian sedge flora. Since it appeared changes (extra findings and taxonomic reinterpretations) are fewer. FNS added seven species and WCL others, but some accepted for FWTA2 and FNS are excluded from WCL.

Using names adopted here, Table 3 indicates the species omitted from one or more of the FWTA2, FNS and WCL lists, and other departures from the WCL position. Most appear because of absence from earlier listings, four relatively or very recently described (*Cyperus leucaspis*, *C. rubidomontanus*, *C. tisserantioides*, *Schoenoplectiella patentiglumis*); some are new national records. Other cases concern problematic taxa, differently interpreted by different taxonomists. Here, three (*Cyperus leucocephalus*, *C. richardii*, *C. sphacelatus*) are interpreted more broadly than by WCL. Two names (*Cyperus fluminalis*, *Schoenoplectiella lateriflora*) respectively replace WCL's *C. smithianus* and *S. supina*, which are dropped in line with studies excluding Nigeria from their ranges. WCL's *Cyperus tibialis* and *C. zollingeri* are discounted because of possible confusion - respectively, with *C. obtusatus* and either *C. permacer* or *C. tenuiculmis*. Neither *C. tibialis* nor *C. zollingeri* is reported for Nigeria in FWTA2 or FNS.

Table 3. Principle differences in sedge species listed for Nigeria in FNS* and by WCL** (19 October 2019), with status for present purposes

Species names	Omitted from:	Remarks:
Bulbostylis densa	WCL	
B. viridecarinata	FWTA2	FNS as *Fimbristylis tisserantii*
Carex chlorosaccus	FWTA2, FNS, WCL	Gotel Mts: Chapman & Chapman (2002)
C. echinochloe	FWTA2, WCL	
Cladium mariscus	FWTA2, FNS	WCL considers introduced to Nigeria – not the present view
Cyperus dichrostachyus	FWTA2, WCL	
C. fluminalis	FWTA2, FNS	includes material named *Cyperus smithianus* (*Pycreus smithianus* in FWTA2 and FNS)
C. involucratus	see remarks	WCL includes as a subspecies of *C. alternifolius* but specific rank is accepted here; considered non -native ("naturalized") in Nigeria
C. jeminicus	FWTA2, WCL	
C. leucaspis	FWTA2, FNS	
C. leucocephalus	see remarks	WCL uses *C. pulchellus* for material from Nigeria, as do FWTA2 and FNS
C. luteus	FWTA2, WCL	FNS as *Mariscus foliosus*
C. michelianus	FWTA2, FNS	
C. obtusatus	see remarks	WCL *C. tibialis* thought possibly this for Nigeria; in FWTA2 and FNS as *Kyllinga erecta* v. *africana* and *K. peruviana*
C. permacer	see remarks	WCL *C. zollingeri* thought possibly this for Nigeria
C. richardii	see remarks	includes *C. albiceps* of WCL; in FWTA2 and FNS as *K. bulbosa*
C. rubidomontanus	FWTA2, FNS, WCL	Gangirwal: Verloove *et al.* (2019), as *P. rubidomontanus*
C. scaettae	FWTA2	FNS as *P. scaettae*
C. sphacelatus	see remarks	includes *C. locuples* of WCL
C. tenuiculmis	see remarks	WCL *C. zollingeri* thought possibly this for Nigeria
C. tisserantioides	FWTA2, FNS	
Fimbristylis dipsacea	FWTA2	
F. schoenoides	FWTA2	
Fuirena pubescens	WCL	
Nemum spadiceum	FWTA2, FNS	
Rhynchospora holoschoenoides	FWTA2, FNS, WCL	Ikeja to Apapa: Lowe (1995)
R. rubra	FWTA2, FNS, WCL	Lekki: Lowe (1995)
Schoenoplectiella lateriflora	see remarks	includes *Schoenoplectiella supina* of WCL
S. patentiglumis	FWTA2, FNS	
Schoenoplectus muricinux	see remarks	considered non -native ("naturalized") in Nigeria; in FWTA2 and FNS as *Scirpus* sp. A
Scleria mikawana	FWTA2, FNS, WCL	Ughelli: (Lowe (1995)
S. parvula	FWTA2, WCL	
S. rehmannii	FWTA2, FNS	
S. secans	see remarks	includes *Scleria boivinii* of WCL

*FNS, Flora of Nigeria, Sedges (Lowe & Stanfield, 1974); **WCL, World Checklist of Cyperaceae (Govaerts *et al.*, 2019)

Discussion

Sedges account for more species than most other families in almost every country. On-line information (Wikipedia) indicates that worldwide among 400 plant families only seven have more species. In Nigeria they rank fifth, with an estimated 232 indigenous species from some 1100-1150 on mainland continental Africa represented. Sedges are components of all Nigeria's

terrestrial environments and vegetation types. From before 1700, when scientific plant specimens were first collected in Nigeria, no specialist has been needed to track down sedges. Every gathering of plants to carry to Europe as curiosities had a chance of including sedges, as the efforts of Kirckwood and Palisot revealed. Sedges were collected even in the rare 19th century visits entering from the north. Nevertheless, even 200 years after Kirckwood, FTA's treatment of sedges was patchy. Away from the coast and the main rivers, collecting progressed little until 60 years after Barter's expedition. Subsequently, inland communications developed and collecting profited as infrastructure reached all areas.

Table 4. Numbers of species of sedges, by genus, across West Africa and in Nigeria's eastern neighbours

	Northern				Southern				W Africa	E neighbours	All
Areas	1	2	3	4	5	6	7	8	1-3, 5-7	4, 8	1-8
Extent (10^6 km^2)	1.03	1.24	1.27	1.28	0.66	1.01	0.92	1.10	6.13	2.38	8.51
Actinoschoenus								1		1	1
Afrotrilepis		1			2	1	1	1	2	1	2
Bolboschoenus	1	1		1	2				2	1	2
Bulbostylis	6	12	8	12	19	15	16	19	19	21	23
Carex	1				1	1	4	7	5	7	8
Cladium				1	1		1	1	1	1	1
Coleochloa							1	2	1	2	2
Cyperus	34	80	48	82	118	117	117	121	147	137	167
Diplacrum		1		1	2	2	2	1	2	1	2
Eleocharis	5	9	6	12	16	12	12	12	17	15	18
Fimbristylis	7	7	9	9	19	18	19	9	22	12	22
Fuirena	1	3	4	4	4	4	5	4	5	5	5
Hypolytrum					8	5	2	11	8	11	17
Isolepis		1					1	2	1	2	2
Mapania					9	7	2	8	10	8	16
Microdracoides					1		1	1	1	1	1
Nemum		1			4	2	2	3	4	3	5
Rhynchospora	1	6	1	5	12	10	10	9	13	9	13
Schoenoplectiella	4	4	4	6	8	8	9	5	10	8	10
Schoenoplectus	2	1	2	2	2	2	1	1	3	2	3
Schoenus				1						1	1
Scirpoides				1						1	1
Scleria	2	14	3	14	30	29	26	31	35	34	42
Genera	11	14	9	14	18	15	19	20	20	23	23
Species	64	141	85	151	258	233	232	249	308	284	364

Area 1: Mauritania; **Area 2:** Mali; **Area 3:** Niger Republic; **Area 4:** Chad; **Area 5:** Gambia, Guinea, Guinea Bissau, Liberia, Senegal, Sierra Leone; **Area 6:** Benin, Burkina Faso, Ghana, Ivory Coast, Togo; **Area 7:** Nigeria; **Area 8:** Cameroon, Central African Republic

Table 5. Species representation by distribution and endemism categories through the West Tropical Africa region and neighbouring parts of the West-Central Tropical Africa and North-East Tropical Africa regions

AREAS	1	2	3	4	5	6	7	8	WTA	4, 8	ALL
Extent (10^6 km^2)	1.03	1.24	1.27	1.28	0.66	1.01	0.92	1.10	6.13	2.38	8.51
Africa endemics:											
>2 Africa regions	18	35	20	37	32	36	39	38	34	37	33
WTA and 1 adjacent region	3	5	1	1	8	7	6	9	8	9	9
***Dispersed through WTA**	0	1	0	0	2	3	2	3	2	3	4
***Shared only with 1 or more adjoining countries**	2	1	1	1	5	4	<1	3	6	3	7
***Single-country endemics**	0	0	0	1	5	1	0	4	5	4	7
Local endemics (*categories pooled)	2	2	1	2	12	8	2	10	13	10	18
Total restricted to Africa	**23**	**42**	**22**	**40**	**52**	**51**	**47**	**57**	**55**	**56**	**60**
Pluricontinental:											
Pantropical	36	21	30	20	16	16	18	14	14	13	13
Extending to east	33	28	40	31	22	24	25	22	22	23	20
Extending to west	5	9	7	8	9	8	9	7	8	7	7
Ranging north from Africa	3	<1	1	1	1	1	1	<1	1	1	<1
Total beyond Africa	**77**	**58**	**78**	**60**	**48**	**49**	**53**	**43**	**45**	**44**	**40**
Species tallies	**64**	**141**	**85**	**151**	**258**	**233**	**232**	**249**	**308**	**284**	**364**

Entries in the body of the table are percentages of the species tallies (bottom row). Note that species shared only with immediate neighbour countries are excluded from the 'adjacent region' percentages.

Africa for present purposes is the Level 1 category as defined for the International Working Group on Taxonomic Databases for Plant Sciences (TDWG). Region for present purposes is the TDWG Level 2 category. Country refers to the TDWG Level 3 unit category.

Area 1: Mauritania; **Area 2:** Mali; **Area 3:** Niger Republic; **Area 4:** Chad (North-East Tropical Africa region); **Area 5:** Gambia, Guinea, Guinea Bissau, Liberia, Senegal, Sierra Leone; **Area 6:** Benin, Burkina Faso, Ghana, Ivory Coast, Togo; **Area 7:** Nigeria; **Area 8:** Cameroon, Central African Republic (West-Central Tropical Africa region); **WTA:** the West Tropical Africa region (Areas 1-3 and 5-7); **Neighbours:** Areas 4 and 8.

While Nigeria's sedge flora can be considered well known, some of the interesting species in it need clarification of their present status. Obvious examples are *Microdracoides squamosa* (collected once?) and *Diplacrum capitatum* (little material, none recent?). Two newer revelations can also be highlighted, *Cladium mariscus* and *Schoenoplectus muricinux*. Both these are accorded naturalized status by WCL. For *Cladium mariscus*, the possibility of indigenous status in Africa must be considered as there are reports of fossil seeds in deposits 38 000 to 70 000

years old in KwaZulu-Natal (*e.g.,* Sievers & Muasya, 2011). *Schoenoplectus muricinux* has proved lately the correct identification for odd collections since 1930. The source area is the Jos Plateau, very remote and little-visited in 1930. Other native species are known to occur as disjunct outliers of ranges further east and south in this mountain area; *S. muricinux* may justify addition to this group.

There must still be more sedge species awaiting detection in Nigeria's 924 000 km^2. A particular area where continuing botanical exploration should prove rewarding is the mountainous terrain of the east, where Nigeria shares with Cameroun species not known further west. More field activity in these border mountains is likely to raise the number of species shared. The Nigeria sedge saga remains work in progress!

Table 6. By area (1-8) within-Africa distribution categories for species endemic to Africa and species extending beyond Africa

	Endemic to Africa					Africa and beyond					Total				
	W	**T**	**N**	**S**	**All**	**W**	**T**	**N**	**S**	**All**	**W**	**T**	**N**	**S**	**All**
1	8	8	5	2	23	59	15	3	0	77	67	23	8	2	100 (64)
2	11	28	1	2	42	40	16	1	1	58	51	44	2	3	100 (141)
3	9	12	1	0	22	56	19	1	2	78	65	31	2	2	100 (85)
4	12	27	1	0	40	44	15	1	0	60	56	42	2	0	100 (151)
5	9	40	<1	3	52	29	15	1	3	48	38	55	1	6	100 (258)
6	9	37	1	4	51	31	15	<1	3	49	40	52	1	7	100 (233)
7	10	34	<1	3	47	34	16	<1	3	53	44	50	<1	6	100 (232)
8	10	43	1	3	57	28	13	<1	2	43	38	56	1	5	100 (249)
WTA	9	42	1	3	55	27	14	1	3	45	36	56	2	6	100 (308)
4, 8	9	44	<1	3	56	30	12	<1	2	44	39	56	1	5	100 (284)
All	8	48	1	3	60	24	12	1	3	40	32	60	2	6	100 (364)

Entries in the body of the table are percentages of the column totals (in parentheses).

Africa for present purposes is the Level 1 category as defined for the International Working Group on Taxonomic Databases for Plant Sciences (TDWG). Region for present purposes is the TDWG Level 2 category. Unit refer to the TDWG Level 3 unit category.

Area 1: Mauritania; **Area 2:** Mali; **Area 3:** Niger Republic; **Area 4:** Chad; **Area 5:** Gambia, Guinea, Guinea Bissau, Liberia, Senegal, Sierra Leone; **Area 6:** Benin, Burkina Faso, Ghana, Ivory Coast, Togo; **Area 7:** Nigeria; **Area 8:** Cameroon, Central African Republic; **WTA:** the West Tropical Africa region (Areas 1-3 and 5-7); **Neighbours:** Areas 4 and 8.

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Appendix. Species of Cyperaceae recorded from Nigeria with FWTA2* and FNS** synonyms where relevant

NAME IN LIST, WITH AUTHORITY	RELEVANT SYNONYMY
Afrotrilepis pilosa (Boeckeler) J.Raynal	
Bulbostylis abortiva (Steud.) C.B.Clarke	
B. barbata (Rottb.) C.B.Clarke	
B. cioniana (Pi.Savi) Lye	FWTA2/FNS: *Fimbristylis cioniana* Savi
B. coleotricha (Hochst. *ex* A.Rich.) C.B.Clarke	
B. densa (Wall.) Hand.-Mazz.	
B. erratica (Hook.f.) C.B.Clarke	
B. filamentosa (Vahl) C.B.Clarke	FWTA2/FNS: *Bulbostylis metralis* Cherm.
B. hensii (C.B.Clarke) R.W.Haines	FWTA2/FNS: *F. hispidula* (Vahl) Kunth
B. hispidula (Vahl) R.W.Haines	FWTA2/FNS: *F. hispidula* (Vahl) Kunth
B. laniceps C.B.Clarke *ex* T.Durand & Schinz	
B. lanifera (Boeckeler) Kük.	
B. oritrephes (Ridl.) C.B.Clarke	
B. pilosa (Willd.) Cherm.	
B. pusilla (Hochst. *ex* A.Rich.) C.B.Clarke	FWTA2/FNS: *B. congolensis* De Wild.
B. scabricaulis Cherm.	
B. viridecarinata (De Wild.) Goetgh.	FNS: *F. tisserantii* Cherm.
Carex chlorosaccus C.B.Clarke	
C. echinochloe Kunze	
C. neochevalieri Kük. *ex* A.Chev.	
C. petitiana A.Rich.	FWTA2/FNS: *Carex preussii* K.Schum.
Cladium mariscus (L.) Pohl	
Coleochloa abyssinica (Hochst. *ex* A.Rich.) Gilly	
Cyperus acuticarinatus Kük.	FWTA2/FNS: *Pycreus acuticarinatus* (Kük.) Cherm.
C. africanus (S.S.Hooper) Reynders	FWTA2/FNS: *P. divulsus* Ridl.
C. alatus (Nees) F.Muell.	FWTA2/FNS: *Kyllinga nigritana* C.B.Cl.
C. albescens (Steud.) Larridon & Govaerts	FWTA2/FNS: *Lipocarpha chinensis* (Osb.) Kern
C. albopilosus (C.B.Clarke) Kük.	FWTA2/FNS: *Mariscus* sp. C
C. alopecuroides Rottb.	
C. amabilis Vahl	
C. angolensis Boeckeler	
C. aromaticus (Ridl.) Mattf. & Kük.	FWTA2/FNS: *K. erecta* Schumach.
C. articulatus L.	
C. ascocapensis Bauters	FWTA2/FNS: *Ascolepis capensis* (Kunth) Ridley
C. ascopusillus Goetgh.	FWTA2/FNS: *A. pusilla* Ridley
C. baronii C.B.Clarke	FWTA2/FNS: *Cyperus mannii* C.B.Cl.
C. blepharoleptos Steud.	FWTA2/FNS: *Scirpus cubensis* Poeppig & Kunth
C. brasiliensis (Kunth) Bauters	FWTA2/FNS: *A. brasiliensis* (Kunth) Benth. *ex* C.B.Cl.
C. brevifolius (Rottb.) Hassk.	FWTA2/FNS: *K. brevifolia* Rottb.
C. breviglumis Lye	FWTA2/FNS: *K. tisserantii* Cherm.
C. buchholzii Boeckeler	FWTA2/FNS: *C. diffusus* Vahl
C. bulbosus Vahl	
C. capillifolius A.Rich.	FWTA2/FNS: *P. capillifolius* (A.Rich.) C.B.Cl.
C. cataractarum (C.B.Clarke) K.Schum. *ex* Engl.	FWTA2/FNS: *P. cataractarum* C.B.Cl.
C. clavinux C.B.Clarke	
C. compressus L.	
C. crassipes Vahl	FWTA2/FNS: *C. maritimus* Poir.
C. cuspidatus Kunth	

C. cyperoides (L.) Kuntze	FWTA2/FNS: *M. alternifolius* Vahl
C. denudatus L.f.	
C. dichrostachyus Hochst. *ex* A.Rich.	
C. difformis L.	
C. digitatus Roxb.	
C. dilatatus Schumach.	
C. dipsacoides (Schumach.) Bauters	FWTA2/FNS: *A. dipsacoides* (Schum.) J.Raynal
C. distans L.f.	FWTA2/FNS: *M. keniensis* (Kük.) Hooper; *M. longibracteatus* Cherm.
C. dubius Rottb.	FWTA2/FNS: *M. dubius* (Rottb.) C.E.C.Fischer
C. elegantulus Steud.	FWTA2/FNS: *P. elegantulus* (Steud.) C.B.Cl.
C. erectus (Schumach.) Mattf. & Kük.	FWTA2/FNS: *K. erecta* Schumach.
C. esculentus L.	
C. exaltatus Retz.	
C. fertilis Boeckeler	
C. flavescens L.	FWTA2/FNS: *P. fallaciosus* Cherm.; *P. flavescens* (Linn.) Reichenb.; FNS: *P. intermedius* C.B.Cl.
C. fluminalis Ridl.	FWTA2/FNS: *P. smithianus* (Ridley) C.B.Cl.

C. hamulosus M.Bieb.	FWTA2/FNS: *M. hamulosus* (M.Bieb.) Hooper
C. haspan L.	
C. hortensis (Salzm. *ex* Steud.) Dorr	FWTA2/FNS: *K. pumila* Michx.; *K. robusta* Boeck.
C. imbricatus Retz.	
C. involucratus Rottb.	
C. iria L.	
C. isolepis (Nees) Bauters	FWTA2/FNS: *S. isolepis* (Nees) Boeck.
C. jeminicus Rottb.	
C. karlschumannii C.B.Clarke	
C. kernii (Raymond) Bauters	FWTA2/FNS: *S. kernii* Raymond
C. koyaliensis Cherm.	
C. kyllingiella Larridon	FWTA2/FNS: *S. microcephalus* (Steud.) Dandy
C. laevigatus L.	
C. lanceolatus Poir.	FWTA2/FNS: *P. lanceolatus* (Poir.) C.B.Cl.
C. leptorhachis Mattf. & Kük.	FWTA2/FNS: *K. debilis* C.B.Cl.
C. leucaspis (J.Raynal) Bauters	
C. leucocephalus Retz.	FWTA2/FNS: *C. pulchellus* R.Br.
C. ligularis L.	FWTA2/FNS: *M. ligularis* (Linn.) Urb.
C. lipofiliformis Goetgh.	FWTA2/FNS: *L. sphacelata* (Vahl) Kunth
C. longus L.	FWTA2/FNS: *C. fenzelianus* Steud.
C. luteus Boeckeler	FNS: *M. foliosus* C.B.Cl.
C. macrostachyos Lam.	FWTA2/FNS: *P. macrostachyos* (Lam.) J.Raynal
C. maculatus Boeckeler	
C. mapanioides C.B.Clarke	
C. margaritaceus Vahl	
C. melanospermus (Nees) Valck.Sur.	FWTA2/FNS: *K. melanosperma* Nees
C. melas Ridl.	FWTA2/FNS: *P. melas* (Ridl.) C.B.Cl.
C. metzii (Hochst. *ex* Steud.) Mattf. & Kük.	FWTA2/FNS: *K. squamulata* Thonn. *ex* Vahl
C. michelianus (L.) Delile	
C. mindorensis (Steud.) Huygh.	FWTA2/FNS: *K. nemoralis* (Forst.) Dandy *ex* Hutch.
C. mortonii (S.S.Hooper) Lye	FWTA2/FNS: *P. mortonii* Hooper
C. mundii (Nees) Kunth	FWTA2/FNS: *P. mundtii* Nees
C. nduru Cherm.	

C. neobarteri T.Koyama	FWTA2/FNS: *L. atra* Ridl.
C. nitidus Lam.	FWTA2/FNS: *P. nitidus* (Lam.) J.Raynal
C. niveus Retz.	FWTA2/FNS: *C. ledermannii* (Kük.) Hooper; *C. tisserantii* Cherm.
C. nuerensis Boeckeler	FWTA2/FNS: *P. nuerensis* (Boeck.) Hooper
C. obtusatus (J.Presl & C.Presl) Mattf. & Kük.	FWTA2/FNS: *K. erecta* Schumach.; *K. peruviana* Lam.
C. odoratus L.	FWTA2/FNS: *Torulinium odoratum* (Linn.) Hooper
C. papyrus L.	
C. pauper Hochst. *ex* A.Rich.	FWTA2/FNS: *P. pauper* (A.Rich.) C.B.Cl.
C. pectinatus Vahl	FWTA2/FNS: *C. nudicaulis* Poir.
C. pedunculatus (R.Br.) J.Kern	FWTA2/FNS: *Remirea maritima* Aubl.
C. permacer C.B.Clarke	
C. persquarrosus T.Koyama	FWTA2/FNS: *L. nana* (A.Rich.) Cherm.
C. podocarpus Boeckeler	
C. polystachyos Rottb.	FWTA2/FNS: *P. polystachyos* (Rottb.) P.Beauv.
C. prieurianus (Steud.) T.Koyama	FWTA2/FNS: *L. prieuriana* Steud.
C. procerus Rottb.	
C. proteus (Welw.) Bauters	FWTA2/FNS: *A. elata* Welw.; *A. protea* Welw.
C. pseudodiaphanus (S.S.Hooper) Lye	FWTA2/FNS: *P. pseudodiaphanus* Hooper
C. pumilus L.	FWTA2/FNS: *P. pumilus* (Linn.) Nees
C. purpureoluteus (Ridl.) Bauters	FWTA2/FNS: *L. albiceps* Ridl.
C. pustulatus Vahl	
C. reduncus Hochst. *ex* Boeckeler	
C. remotispicatus S.S.Hooper	
C. renschii Boeckeler	
C. richardii Steud.	FWTA2/FNS: *K. bulbosa* P.Beauv.
C. rotundus L.	FWTA2/FNS: *C. tuberosus* Rottb.
C. rubidomontanus (J.Browning) Larridon	
C. scaettae (Cherm.) Reynders	FNS: *P. scaettae* Cherm.
C. sesquiflorus (Torr.) Mattf. & Kük.	FWTA2/FNS: *K. odorata* Vahl
C. soyauxii Boeckeler	FWTA2/FNS: *M. soyauxii* (Boeck.) C.B.Cl.
C. sphacelatus Rottb.	
C. squarrosus L.	FWTA2/FNS: *M. squarrosus* (Linn.) C.B.Cl.
C. submicrolepis Kük.	
C. tenax Boeckeler	
C. tenuiculmis Boeckeler	
C. tenuifolius (Steud.) Dandy	FWTA2/FNS: *K. tenuifolia* Steud.
C. tenuis Sw.	FWTA2/FNS: *M. flabelliformis* Kunth; FNS: *M. luridus* C.B.Cl.
C. tenuispica Steud.	
C. testui (Cherm.) Reynders	FWTA2/FNS; WCL as "unplaced": *P. testui* Cherm.
C. tisserantioides (Mtot.) Lye	
C. tomaiophyllus K.Schum.	FWTA2/FNS: *M. tomaiophyllus* (K.Schum.) C.B.Cl.
C. tonkinensis C.B.Clarke	
C. unioloides R.Br.	FWTA2/FNS: *P. unioloides* (R.Br.) Urb.
C. welwitschii (Ridl.) Lye	FWTA2/FNS: *K. welwitschii* Ridley
Diplacrum africanum (Benth.) C.B.Clarke	
D. capitatum (Willd.) Boeckeler	FWTA2/FNS: *Diplacrum longifolium* (Griseb.) C.B.Cl.
Eleocharis acutangula (Roxb.) Schult.	
E. atropurpurea (Retz.) J.Presl & C.Presl	

E. brainii Svenson	
E. complanata Boeckeler	
E. confervoides (Poir.) Steud.	FWTA2/FNS: *Websteria confervoides* (Poir.) Hooper
E. dulcis (Burm.f.) Trin. *ex* Hensch.	
E. geniculata (L.) Roem. & Schult.	
E. mutata (L.) Roem. & Schult.	
E. naumanniana Boeckeler	
E. nupeensis Hutch.	
E. setifolia (A.Rich.) J.Raynal	
E. variegata (Poir.) C.Presl	
Fimbristylis alboviridis C.B.Clarke	
F. aphylla Steud.	
F. barteri Boeckeler	
F. bisumbellata (Forssk.) Bubani	
F. complanata (Retz.) Link	
F. cymosa R.Br.	FWTA2/FNS: *F. obtusifolia* Kunth
F. debilis Steud.	
F. dichotoma (L.) Vahl	
F. dipsacea (Rottb.) C.B.Clarke	
F. ferruginea (L.) Vahl	
F. littoralis Gaudich.	
F. microcarya F.Muell.	FWTA2/FNS: *F. thonningiana* Boeck.
F. nigritana C.B.Clarke	
F. ovata (Burm.f.) J.Kern	
F. pilosa Vahl	
F. quinquangularis (Vahl) Kunth	
F. scabrida Schumach.	
F. schoenoides (Retz.) Vahl	
F. squarrosa Vahl	
Fuirena ciliaris (L.) Roxb.	
F. leptostachya Oliv.	
F. pubescens (Poir.) Kunth	
F. stricta Steud.	
F. umbellata Rottb.	
Hypolytrum heteromorphum Nelmes	
H. purpurascens Cherm.	
Isolepis fluitans (L.) R.Br.	FWTA2/FNS: *Scirpus fluitans* Linn.
Mapania amplivaginata K.Schum.	
M. rhynchocarpa Lourignon & Raynal	FWTA2/FNS: *Mapania macrantha* (Boeck.) Pfeiffer
Microdracoides squamosus Hua	
Nemum angolense (C.B.Clarke) Larridon & Goetgh.	*Scirpus angolensis* C.B.Cl.
N. spadiceum (Lam.) Desv.	
Rhynchospora brevirostris Griseb.	
R. candida (Nees) Boeckeler	
R. corymbosa (L.) Britton	
R. eximia (Nees) Boeckeler	
R. gracillima Thwaites	
R. holoschoenoides (Rich.) Herter	
R. perrieri Cherm.	
R. rubra (Lour.) Makino	
R. rugosa (Vahl) Gale	

R. triflora Vahl	
Schoenoplectiella articulata (L.) Lye	FWTA2/FNS: *Scirpus articulatus* Linn.
S. erecta (Poir.) Lye	FWTA2/FNS: *S. uninodis* (Del.) Boiss.
S. juncea (Willd.) Lye	FWTA2/FNS: *S. aureiglumis* Hooper
S. lateriflora (J.F.Gmel.) Lye	FWTA2/FNS: *S. lateriflorus* Gmel.
S. mucronata (L.) J.Jung & H.K.Choi	FWTA2/FNS: *S. mucronatus* Linn.
S. oxyjulos (S.S.Hooper) Lye	FWTA2/FNS: *S. oxyjulos* Hooper
S. patentiglumis (Hayas.) Hayas.	
S. roylei (Nees) Lye	FWTA2/FNS: *S. roylei* (Nees) Parker
S. senegalensis (Steud.) Lye	FWTA2/FNS: *S. jacobii* C.E.C.Fischer
Schoenoplectus corymbosus (Roth *ex* Roem. & Schult.) J.Raynal	FWTA2/FNS: *S. brachyceras* Hochst. *ex* A.Rich.
S. muricinux (C.B.Clarke) J.Raynal	FWTA2/FNS: *S.* sp. A
Scleria achtenii De Wild.	
S. bulbifera Hochst. *ex* A.Rich.	
S. catophylla C.B.Clarke	FWTA2/FNS: *Scleria aterrima* (Ridley) Napper
S. depressa (C.B.Clarke) Nelmes	
S. distans Poir.	FWTA2/FNS: *S. hirtella* Swartz; *S. nutans* Kunth
S. foliosa Hochst. *ex* A.Rich.	
S. gaertneri Raddi	FWTA2/FNS: *S. pterota* Presl
S. globonux C.B.Clarke	
S. gracillima Boeckeler	
S. iostephana Nelmes	
S. *lagoensis* Boeckeler	
S. lithosperma (L.) Sw.	
S. melanomphala Kunth	
S. melanotricha Hochst. *ex* A.Rich.	FWTA2/FNS: *S. grata* Nelmes
S. mikawana Makino	
S. naumanniana Boeckeler	
S. parvula Steud.	
S. pergracilis (Nees) Kunth	
S. pooides Ridl.	
S. rehmannii C.B.Clarke	
S. schimperiana Boeckeler	
S. secans (L.) Urb.	FWTA2/FNS: *S. boivinii* Steud.
S. tessellata Willd.	FWTA2/FNS: *S. sphaerocarpa* (E.A.Robinson) Napper
S. verrucosa Willd.	
S. vogelii C.B.Clarke	
S. woodii C.B.Clarke	FWTA2/FNS: *S. striatinux* De Wild.

Appendix. Species of Cyperaceae recorded from Nigeria - with FWTA2* and FNS** synonyms in square brackets

Afrotrilepis pilosa (Boeckeler) J.Raynal; *Bulbostylis abortiva* (Steud.) C.B.Clarke; *B. barbata* (Rottb.) C.B.Clarke; *B. cioniana* (Pi.Savi) Lye [FWTA2/FNS: *Fimbristylis cioniana* Savi]; *B. coleotricha* (Hochst. *ex* A.Rich.) C.B.Clarke; *B. densa* (Wall.) Hand.-Mazz.; *B. erratica* (Hook.f.) C.B.Clarke; *B. filamentosa* (Vahl) C.B.Clarke [FWTA2/FNS: *Bulbostylis metralis* Cherm.]; *B. hensii* (C.B.Clarke) R.W.Haines [FWTA2/FNS: *F. hispidula* (Vahl) Kunth]; *B. hispidula* (Vahl) R.W.Haines [FWTA2/FNS: *F. hispidula* (Vahl) Kunth]; *B. laniceps* C.B.Clarke *ex* T.Durand & Schinz; *B. lanifera* (Boeckeler) Kük.; *B. oritrephes* (Ridl.) C.B.Clarke; *B. pilosa* (Willd.) Cherm.; *B. pusilla* (Hochst. *ex* A.Rich.) C.B.Clarke [FWTA2/FNS: *B. congolensis* De Wild.]; *B. scabricaulis* Cherm.; *B. viridecarinata* (De Wild.) Goetgh. [FNS: *F. tisserantii* Cherm.]; *Carex chlorosaccus* C.B.Clarke; *C. echinochloe* Kunze; *C. neochevalieri* Kük. *ex* A.Chev.; *C. petitiana* A.Rich. [FWTA2/FNS: *Carex preussii* K.Schum.]; *Cladium mariscus* (L.) Pohl; *Coleochloa abyssinica* (Hochst. *ex* A.Rich.) Gilly; *Cyperus acuticarinatus* Kük. [FWTA2/FNS: *Pycreus acuticarinatus* (Kük.) Cherm.; *C. africanus* (S.S.Hooper) Reynders [FWTA2/FNS: *P. divulsus* Ridl.]; *C. alatus* (Nees) F.Muell. [FWTA2/FNS: *Kyllinga nigritana* C.B.Cl.]; *C. albescens* (Steud.) Larridon & Govaerts [FWTA2/FNS: *Lipocarpha chinensis* (Osb.) Kern]; *C. albopilosus* (C.B.Clarke) Kük. [FWTA2/FNS: *Mariscus* sp. C]; *C. alopecuroides* Rottb.; *C. amabilis* Vahl; *C. angolensis* Boeckeler; *C. aromaticus* (Ridl.) Mattf. & Kük. [FWTA2/FNS: *K. erecta* Schumach.]; *C. articulatus* L.; *C. ascocapensis* Bauters [FWTA2/FNS: *Ascolepis capensis* (Kunth) Ridley]; *C. ascopusillus* Goetgh. [FWTA2/FNS: *A. pusilla* Ridley]; *C. baronii* C.B.Clarke [FWTA2/FNS: *Cyperus mannii* C.B.Cl.]; *C. blepharoleptos* Steud. [FWTA2/FNS: *Scirpus cubensis* Poeppig & Kunth]; *C. brasiliensis* (Kunth) Bauters [FWTA2/FNS: *A. brasiliensis* (Kunth) Benth. *ex* C.B.Cl.]; *C. brevifolius* (Rottb.) Hassk. [FWTA2/FNS: *K. brevifolia* Rottb.]; *C. breviglumis* Lye [FWTA2/FNS: *K. tisserantii* Cherm.]; *C. buchholzii* Boeckeler [FWTA2/FNS: *C. diffusus* Vahl]; *C. bulbosus* Vahl; *C. capillifolius* A.Rich. [FWTA2/FNS: *P. capillifolius* (A.Rich.) C.B.Cl.]; *C. cataractarum* (C.B.Clarke) K.Schum. *ex* Engl. [FWTA2/FNS: *P. cataractarum* C.B.Cl.]; *C. clavinux* C.B.Clarke; *C. compressus* L.; *C. crassipes* Vahl [FWTA2/FNS: *C. maritimus* Poir.]; *C. cuspidatus* Kunth; *C. cyperoides* (L.) Kuntze [FWTA2/FNS: *M. alternifolius* Vahl]; *C. denudatus* L.f.; *C. dichrostachyus* Hochst. *ex* A.Rich.; *C. difformis* L.; *C. digitatus* Roxb.; *C. dilatatus* Schumach.; *C. dipsacoides* (Schumach.) Bauters [FWTA2/FNS: *A. dipsacoides* (Schum.) J.Raynal]; *C. distans* L.f. [FWTA2/FNS: *M. keniensis* (Kük.) Hooper; *M. longibracteatus* Cherm.]; *C. dubius* Rottb. [FWTA2/FNS: *M. dubius* (Rottb.) C.E.C.Fischer]; *C. elegantulus* Steud. [FWTA2/FNS: *P. elegantulus* (Steud.) C.B.Cl.]; *C. erectus* (Schumach.) Mattf. & Kük. [FWTA2/FNS: *K. erecta* Schumach.]; *C. esculentus* L.; *C. exaltatus* Retz.; *C. fertilis* Boeckeler; *C. flavescens* L. [FWTA2/FNS: *P. fallaciosus* Cherm.; *P. flavescens* (Linn.) Reichenb.; FNS: *P. intermedius* C.B.Cl.]; *C. fluminalis* Ridl. [FWTA2/FNS: *P. smithianus* (Ridley) C.B.Cl.]; *C. hamulosus* M.Bieb. [FWTA2/FNS: *M. hamulosus* (M.Bieb.) Hooper]; *C. haspan* L.; *C. hortensis* (Salzm. *ex* Steud.) Dorr [FWTA2/FNS: *K. pumila* Michx.; *K. robusta* Boeck.]; *C. imbricatus* Retz.; *C. involucratus* Rottb.; *C. iria* L.; *C. isolepis* (Nees) Bauters [FWTA2/FNS: *S. isolepis* (Nees) Boeck.]; *C. jeminicus* Rottb.; *C. karlschumannii* C.B.Clarke; *C. kernii* (Raymond) Bauters [FWTA2/FNS: *S. kernii* Raymond]; *C. koyaliensis* Cherm.; *C. kyllingiella* Larridon [FWTA2/FNS: *S. microcephalus* (Steud.) Dandy]; *C. laevigatus* L.; *C. lanceolatus* Poir. [FWTA2/FNS: *P. lanceolatus* (Poir.) C.B.Cl.]; *C. leptorhachis* Mattf. & Kük. [FWTA2/FNS: *K. debilis* C.B.Cl.]; *C. leucaspis* (J.Raynal) Bauters; *C. leucocephalus* Retz. [FWTA2/FNS: *C. pulchellus* R.Br.]; *C. ligularis* L. [FWTA2/FNS: *M. ligularis* (Linn.) Urb.]; *C. lipofiliformis* Goetgh. [FWTA2/FNS: *L. sphacelata* (Vahl) Kunth]; *C. longus* L. [FWTA2/FNS: *C. fenzelianus* Steud.]; *C. luteus* Boeckeler [FNS: *M. foliosus* C.B.Cl.]; *C. macrostachyos* Lam.

[FWTA2/FNS: *P. macrostachyos* (Lam.) J.Raynal]; *C. maculatus* Boeckeler; *C. mapanioides* C.B.Clarke; *C. margaritaceus* Vahl; *C. melanospermus* (Nees) Valck.Sur. [FWTA2/FNS: *K. melanosperma* Nees]; *C. melas* Ridl. [FWTA2/FNS: *P. melas* (Ridl.) C.B.Cl.]; *C. metzii* (Hochst. *ex* Steud.) Mattf. & Kük. [FWTA2/FNS: *K. squamulata* Thonn. *ex* Vahl]; *C. michelianus* (L.) Delile; *C. mindorensis* (Steud.) Huygh. [FWTA2/FNS: *K. nemoralis* (Forst.) Dandy *ex* Hutch.]; *C. mortonii* (S.S.Hooper) Lye [FWTA2/FNS: *P. mortonii* Hooper]; *C. mundii* (Nees) Kunth [FWTA2/FNS: *P. mundtii* Nees]; *C. nduru* Cherm.; *C. neobarteri* T.Koyama [FWTA2/FNS: *L. atra* Ridl.]; C. *nitidus* Lam. [FWTA2/FNS: *P. nitidus* (Lam.) J.Raynal]; *C. niveus* Retz. [FWTA2/FNS: *C. ledermannii* (Kük.) Hooper; *C. tisserantii* Cherm.]; *C. nuerensis* Boeckeler [FWTA2/FNS: *P. nuerensis* (Boeck.) Hooper]; *C. obtusatus* (J.Presl & C.Presl) Mattf. & Kük. [FWTA2/FNS: *K. erecta* Schumach.; *K. peruviana* Lam.]; *C. odoratus* L. [FWTA2/FNS: *Torulinium odoratum* (Linn.) Hooper]; *C. papyrus* L.; *C. pauper* Hochst. *ex* A.Rich. [FWTA2/FNS: *P. pauper* (A.Rich.) C.B.Cl.]; *C. pectinatus* Vahl [FWTA2/FNS: *C. nudicaulis* Poir.]; *C. pedunculatus* (R.Br.) J.Kern [FWTA2/FNS: *Remirea maritima* Aubl.]; *C. permacer* C.B.Clarke; *C. persquarrosus* T.Koyama [FWTA2/FNS: *L. nana* (A.Rich.) Cherm.]; *C. podocarpus* Boeckeler; *C. polystachyos* Rottb. [FWTA2/FNS: *P. polystachyos* (Rottb.) P.Beauv.]; *C. prieurianus* (Steud.) T.Koyama [FWTA2/FNS: *L. prieuriana* Steud.]; *C. procerus* Rottb.; *C. proteus* (Welw.) Bauters [FWTA2/FNS: *A. elata* Welw.; *A. protea* Welw.]; *C. pseudodiaphanus* (S.S.Hooper) Lye [FWTA2/FNS: *P. pseudodiaphanus* Hooper]; *C. pumilus* L. [FWTA2/FNS: *P. pumilus* (Linn.) Nees]; *C. purpureoluteus* (Ridl.) Bauters [FWTA2/FNS: *L. albiceps* Ridl.]; *C. pustulatus* Vahl; *C. reduncus* Hochst. *ex* Boeckeler; *C. remotispicatus* S.S.Hooper; *C. renschii* Boeckeler; *C. richardii* Steud. [FWTA2/FNS: *K. bulbosa* P.Beauv.]; *C. rotundus* L. [FWTA2/FNS: *C. tuberosus* Rottb.]; *C. rubidomontanus* (J.Browning) Larridon; *C. scaettae* (Cherm.) Reynders [FNS: *P. scaettae* Cherm.]; *C. sesquiflorus* (Torr.) Mattf. & Kük. [FWTA2/FNS: *K. odorata* Vahl]; *C. soyauxii* Boeckeler [FWTA2/FNS: *M. soyauxii* (Boeck.) C.B.Cl.]; *C. sphacelatus* Rottb.; *C. squarrosus* L. [FWTA2/FNS: *M. squarrosus* (Linn.) C.B.Cl.]; *C. submicrolepis* Kük.; *C. tenax* Boeckeler; *C. tenuiculmis* Boeckeler; *C. tenuifolius* (Steud.) Dandy [FWTA2/FNS: *K. tenuifolia* Steud.]; *C. tenuis* Sw. [FWTA2/FNS: *M. flabelliformis* Kunth; FNS: *M. luridus* C.B.Cl.]; *C. tenuispica* Steud.; *C. testui* (Cherm.) Reynders [FWTA2/FNS; WCL as "unplaced": *P. testui* Cherm.]; *C. tisserantioides* (Mtot.) Lye; *C. tomaiophyllus* K.Schum. [FWTA2/FNS: *M. tomaiophyllus* (K.Schum.) C.B.Cl.]; *C. tonkinensis* C.B.Clarke; *C. unioloides* R.Br. [FWTA2/FNS: *P. unioloides* (R.Br.) Urb.]; *C. welwitschii* (Ridl.) Lye [FWTA2/FNS: *K. welwitschii* Ridley]; *Diplacrum africanum* (Benth.) C.B.Clarke; *D. capitatum* (Willd.) Boeckeler [FWTA2/FNS: *Diplacrum longifolium* (Griseb.) C.B.Cl.]; *Eleocharis acutangula* (Roxb.) Schult.; *E. atropurpurea* (Retz.) J.Presl & C.Presl; *E. brainii* Svenson; *E. complanata* Boeckeler; *E. confervoides* (Poir.) Steud. [FWTA2/FNS: *Websteria confervoides* (Poir.) Hooper]; *E. dulcis* (Burm.f.) Trin. *ex* Hensch.; *E. geniculata* (L.) Roem. & Schult.; *E. mutata* (L.) Roem. & Schult.; *E. naumanniana* Boeckeler; *E. nupeensis* Hutch.; *E. setifolia* (A.Rich.) J.Raynal; *E. variegata* (Poir.) C.Presl; *Fimbristylis alboviridis* C.B.Clarke; *F. aphylla* Steud.; *F. barteri* Boeckeler; *F. bisumbellata* (Forssk.) Bubani; *F. complanata* (Retz.) Link; *F. cymosa* R.Br. [FWTA2/FNS: *F. obtusifolia* Kunth]; *F. debilis* Steud.; *F. dichotoma* (L.) Vahl; *F. dipsacea* (Rottb.) C.B.Clarke; *F. ferruginea* (L.) Vahl; *F. littoralis* Gaudich.; *F. microcarya* F.Muell. [FWTA2/FNS: *F. thonningiana* Boeck.]; *F. nigritana* C.B.Clarke; *F. ovata* (Burm.f.) J.Kern; *F. pilosa* Vahl; *F. quinquangularis* (Vahl) Kunth; *F. scabrida* Schumach.; *F. schoenoides* (Retz.) Vahl; *F. squarrosa* Vahl; *Fuirena ciliaris* (L.) Roxb.; *F. leptostachya* Oliv.; *F. pubescens* (Poir.) Kunth; *F. stricta* Steud.; *F. umbellata* Rottb.; *Hypolytrum heteromorphum* Nelmes; *H. purpurascens* Cherm.; *Isolepis fluitans* (L.) R.Br. [FWTA2/FNS: *Scirpus fluitans* Linn.]; *Mapania amplivaginata* K.Schum.; *M. rhynchocarpa* Lourignon & Raynal [FWTA2/FNS: *Mapania macrantha* (Boeck.) Pfeiffer]; *Microdracoides squamosus* Hua; *Nemum angolense* (C.B.Clarke) Larridon & Goetgh. [FWTA2/FNS: *Scirpus angolensis* C.B.Cl.]; *N. spadiceum* (Lam.) Desv.; *Rhynchospora brevirostris* Griseb.; *R. candida* (Nees) Boeckeler; *R. corymbosa* (L.) Britton; *R.*

eximia (Nees) Boeckeler; *R. gracillima* Thwaites; *R. holoschoenoides* (Rich.) Herter; *R. perrieri* Cherm.; *R. rubra* (Lour.) Makino; *R. rugosa* (Vahl) Gale; *R. triflora* Vahl; *Schoenoplectiella articulata* (L.) Lye [FWTA2/FNS: *Scirpus articulatus* Linn.]; *S. erecta* (Poir.) Lye [FWTA2/FNS: *S. uninodis* (Del.) Boiss.]; *S. juncea* (Willd.) Lye [FWTA2/FNS: *S. aureiglumis* Hooper]; *S. lateriflora* (J.F.Gmel.) Lye [FWTA2/FNS: *S. lateriflorus* Gmel.]; *S. mucronata* (L.) J.Jung & H.K.Choi [FWTA2/FNS: *S. mucronatus* Linn.]; *S. oxyjulos* (S.S.Hooper) Lye [FWTA2/FNS: *S. oxyjulos* Hooper]; *S. patentiglumis* (Hayas.) Hayas.; *S. roylei* (Nees) Lye [FWTA2/FNS: *S. roylei* (Nees) Parker]; *S. senegalensis* (Steud.) Lye [FWTA2/FNS: *S. jacobii* C.E.C.Fischer]; *Schoenoplectus corymbosus* (Roth *ex* Roem. & Schult.) J.Raynal [FWTA2/FNS: *S. brachyceras* Hochst. *ex* A.Rich.]; *S. muricinux* (C.B.Clarke) J.Raynal [FWTA2/FNS: *S.* sp. A]; *Scleria achtenii* De Wild.; *S. bulbifera* Hochst. *ex* A.Rich.; *S. catophylla* C.B.Clarke [FWTA2/FNS: *Scleria aterrima* (Ridley) Napper]; *S. depressa* (C.B.Clarke) Nelmes; *S. distans* Poir. [FWTA2/FNS: *S. hirtella* Swartz; *S. nutans* Kunth]; *S. foliosa* Hochst. *ex* A.Rich.; *S. gaertneri* Raddi [FWTA2/FNS: *S. pterota* Presl]; *S. globonux* C.B.Clarke; *S. gracillima* Boeckeler; *S. iostephana* Nelmes; S. *lagoensis* Boeckeler; *S. lithosperma* (L.) Sw.; *S. melanomphala* Kunth; *S. melanotricha* Hochst. *ex* A.Rich. [FWTA2/FNS: *S. grata* Nelmes]; *S. mikawana* Makino; *S. naumanniana* Boeckeler; *S. parvula* Steud.; *S. pergracilis* (Nees) Kunth; *S. pooides* Ridl.; *S. rehmannii* C.B.Clarke; *S. schimperiana* Boeckeler; *S. secans* (L.) Urb. [FWTA2/FNS: *S. boivinii* Steud.]; *S. tessellata* Willd. [FWTA2/FNS: *S. sphaerocarpa* (E.A.Robinson) Napper]; *S. verrucosa* Willd.; *S. vogelii* C.B.Clarke; *S. woodii* C.B.Clarke [FWTA2/FNS: *S. striatinux* De Wild.]