



Re-instatement of *Bulbostylis tisserantii* (Cyperaceae) an ignored species from Central Africa

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Abstract

Bulbostylis viridecarinata (De Wild.) Goetgh. is a widespread species occurring in many parts of Tropical Africa. *Bulbostylis tisserantii* Cherm. was synonymized with this species but based on numerous morphological differences this species should be re-instated at species rank. It is only known from three collections, all originating in the southern part of the Central African Republic. Descriptions and conservation status for both species are provided and their main distinguishing features are opposed and illustrated. Lectotypes are designated for *Bulbostylis fasciculata* Cherm. and *Fimbristylis tisserantii* Cherm.

Key words: *Bulbostylis*, Central African Republic, Cyperaceae, taxonomy

Introduction

As currently delimited, the genus *Bulbostylis* Kunth (Kunth 1837: 205) (Abildgaardieae, Cyperaceae) includes 219 species worldwide (Govaerts *et al.* 2019). *Bulbostylis* is characterized by eligulate leaves, leaf sheaths with a pilose orifice, an anthelate or capitate inflorescence with (1–) few-many spikelets, usually short primary bracts, deciduous, usually spirally arranged glumes, bisexual flowers that lack a perianth, a trifold (less often bifid) style with most often distinct base, thickened and persistent as a distinct knob on the mature, often ornamented nutlet. *Nemum* Desv. ex Ham. (Hamilton 1825: 13) is a similar genus. However, the glumes are persistent and style bases are not thickened and deciduous. Based on molecular studies *Nemum* with 8 species has recently been included in *Bulbostylis* (Roalson *et al.* 2019). *Bulbostylis* is also often confused with *Fimbristylis* (Vahl 1805: 205), but in the latter genus leaf sheaths do not have a pilose orifice and the base of the style is generally falling with the rest of the style.

Bulbostylis is very poorly known in the Central African Republic. Based on Chermezon's studies (1931, 1936) currently only 11 species are known in this country. Most of them are widespread in the rest of tropical Africa and only *B. multispicula* Cherm. (Chermezon 1931: 38) is considered as an endemic species. Chermezon (1931) described two species of *Fimbristylis* and seven of *Bulbostylis* in his Cyperaceae monograph of the Central African Republic. Most of these were later synonymized (Goetghebeur & Coudijzer 1985, Govaerts *et al.* 2019). Chermezon described *Bulbostylis fasciculata* Cherm. (Chermezon 1931: 36) as a new species. Later he realized that this name had already been occupied by Uittien for a species described from South America in 1925 (Uittien 1925: 338). To correct this he later proposed the replacement name *B. tisserantii* Cherm. (Chermezon 1936: 11). In the same paper he also described *Fimbristylis tisserantii* Cherm. (Chermezon 1931: 32); however, this species has characters (e.g. leaf sheath with long hairs, transversely ridged nutlet) that fit to *Bulbostylis* rather than to *Fimbristylis*. Lye (1971) therefore transferred this species to *Bulbostylis* as *B. tisserantii* (Cherm.) Lye. However, Verdcourt (2010) realized that *B. tisserantii* (Cherm.) Lye, based on *F. tisserantii*, is an illegitimate name since it is a homonym of *B. tisserantii* Cherm., a different species. Thus he proposed *B. lyei* Verdc. as a new name for *F. tisserantii* (Verdcourt 2010: 86). Although this name was accepted in *Atlas of the Flora of Ivory Coast* (Chatelain *et al.* 2011), this is a superfluous name since Verdcourt (2010) overlooked that there is already a name available in *Bulbostylis* for *F. tisserantii*, namely *B. viridecarinata* Goetgh.

(Goetghebeur 1984: 104), a species that was also described from the Central African Republic. Both Goetghebeur & Coudijzer (1985) and Govaerts *et al.* (2019) treated *F. tisserantii* and *B. tisserantii* as synonyms of *B. viridecarinata*. Although based on Chermezon's descriptions it is quite obvious that *F. tisserantii* and *B. tisserantii* are two different species, the latter became a neglected species.

Material and methods

The morphological characteristics observed in all known specimens of *B. tisserantii* were compared with several specimens of *B. viridecarinata* in BR and P (abbreviations following Thiers, 2019+). An Alpha stereomicroscope with graticule at magnification $\times 40$ was used for investigation of macro-morphological characters. Measurements of the characters (see Table 1.) were taken from all the studied specimens using a caliper calibrated in tenths of a millimetre. Dried material for scanning electron microscopy was mounted on aluminium stubs using carbon adhesive tape and coated with a platinum palladium mix with a Cressington JFC-2300/208HR sputter coater. SEM images were obtained with a JEOL JSM7100F field emission scanning electron microscope.

TABLE 1. Comparison of the main differences between *Bulbostylis tisserantii* and *B. viridecarinata*.

	<i>Bulbostylis tisserantii</i>	<i>Bulbostylis viridecarinata</i>
Stem	Glabrous	Glabrous but scabrid below inflorescence
Inflorescence	Compound (primary and secondary branches) with numerous spikelets; branches smooth	Sub-simple, with (3–)4–7(–20) spikelets; branches scabrous just below spikelet
Spikelets	Usually fascicled (2–4 together), $3\text{--}4 \times 1\text{--}1.25$ mm	Solitary, (8–) 12–16 \times (2.5–) 4–6 mm
Glume	2.25–2.5 mm long, dark reddish brown to black with paler keel	(3.5–) 5.5–6 mm long, pale reddish (rarely darker) with distinct green keel
Nutlet	Obovoid-trigonous, finely and regularly punctulate-tuberculate, with very short style base less than $1/10 \times$ nutlet length	Narrowly obovoid-trigonous, slightly to conspicuously transversely rugose, with distinct style base, c. $1/4\text{--}1/6 \times$ nutlet length

Results

As well as the type material, we investigated all known specimens of *B. tisserantii* and numerous collections of *B. viridecarinata*. Based on our morphological investigations we found additional differences between the two species. These are summarized in Table 1.

Based on these differences we suggest that *Bulbostylis tisserantii* Cherm. is excluded from the synonymy of *B. viridecarinata*.

Bulbostylis viridecarinata (De Wild.) Goetgh., Bull. Jard. Bot. Natl. Belg. 54: 104 (1984).

≡ *Fimbristylis viridecarinata* De Wild., Pl. Bequaert. 4: 207 (1927).

Lectotype: Sapin s.n.; Jan. 1980; Demba, Central African Republic (BR), designated by Goetghebeur & Coudijzer, Bull. Jard. Bot. Natl. Belg. 55: 222 (1985). Image: <http://www.botanicalcollections.be/#/en/details/BR0000008637550>.

= *Bulbostylis tisserantii* (Cherm.) Lye, Mitt. Bot. Staatssamml. München 10: 547 (1971), nom. illeg.

≡ *Fimbristylis tisserantii* Cherm., Arch. Bot. Bull. Mens. 4(7): 32 (1931).

Type: lectotype, designated here: Tisserant C. 1953 (P00462595), Région de la Ouaka: Marais près de la rivière Ngukpwanga, 25 km S.W. d'Ipipy, Central African Republic, 25.06.1925 (image available at: <https://science.mnhn.fr/institution/mnhn/collection/p/item/p00462595>). Isolectotype: Tisserant C. 157 (P00462596)

= *Bulbostylis lyei* Verdc., Fl. Trop. E. Afr., Cyperac.: 86 (2010), nom. superfl.

A rather robust and tufted perennial with a short rhizome, stem base with red-brown cataphylls; stem 20–90 cm long, 0.4–0.7 mm thick, ridged, glabrous but scabrid in the upper half; leaves with a few long white hairs at the leaf sheath orifice. Leaf sheaths straw-colored to reddish brown or purplish, glabrous to shortly hairy with 5–10 mm long hairs at orifice. Leaf blade remarkably flat and up to 1.5 mm wide; 10–25 cm long, scabrid to densely short hairy. Inflorescence

anthelate, with (3–)4–12(–20) spikelets or rarely reduced to a single spikelet, inflorescence branches scaberulous in the upper half; spikelets 8–15 × 2.5–4 mm, lanceolate; bracts 2–5, leafy, the largest 1–7 cm long, densely scabrid or shortly hairy, glumes 10–15, 3.5–5 × 1.6–2 mm, typically cinnamon-coloured with a green midnerve, rarely darker brownish, mucronulate to emarginate, sometimes fimbriolate, glabrous to minutely hispidulous; nutlet ca. 1–1.2 × 0.8 mm, whitish to pale reddish brown, trigonous conspicuously transversely wrinkled, with 3 pronounced ribs.

Distribution: Tropical Africa, from Guinea and Togo over the Central African Republic and Democratic Republic of Congo, towards Zambia and N Mozambique, between 800–1,700 m (Goetghebeur & Coudijzer 1985)

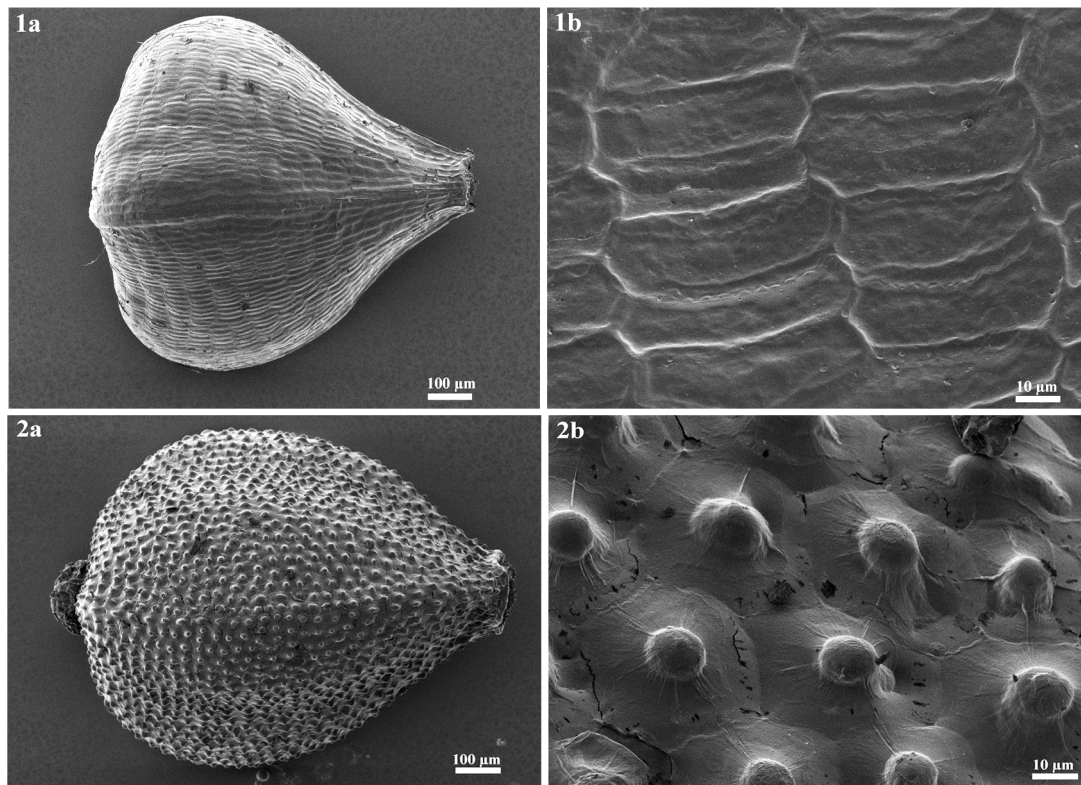


FIGURE 1. Comparison of the nutlet shape and surface of *B. viridecarinata* (BR0000008638199 collector unknown) (1a–b.) and *B. tisserantii* (BR0000008637512 Tisserant 2695) (2a–b.) (SEM photos: Iris Van der Beeten).

Habitat:

Grassland, forest savanna, sometimes as a weed in cultivation, dambo, edge of marshes, often on sandy soil.

Specimens examined:

Zambia: Mungwi, 31.01.1961, E.A. Robinson 4330 (P); Abercom, 26.01.1954, Siame 296 (P). **Chad:** Bar Banda, 03.12.1902, A. Chevalier 6644 (P). **Central African Republic:** Demba, 01.1980, Sapin s.n. (BR). **Democratic Republic of Congo:** Mitombe (Tshofa), 12.1930, Lomami 46 (BR); Atene, 01.1914, H. Vanderyst 3422 (BR); Plaine de la Ruzizi, Kindava, 22.01.1950, R.G.A. Germain 5774 (BR); Station Forêt claire à proximité de la chute Kaloba, à 22,5 km à l'W.S.W. du Poste de Lualaba (Plateau des Kundelungu), 07.01.1970, Lisowski S., Malaisse F. & Symoens J. 9310 (BR). **Burundi:** Territoire Bubanza, Plaine Rusizi, km 14, 04.05.1974, Reekmans M. 3315 (BR); Territoire Bujumbura, Plaine Rusizi, km 14, 13.02.1972, Reekmans M. 1542 (BR); Station Usumbura, 25.04.1944, Vrydagh J.-M. 607 (BR). **Tanzania:** Sumbawanga District, 21.04.1972, E.A. Robinson 5100 (BR).

Conservation status: LC. The species is widely distributed in forest savanna regions of Tropical Africa. It occurs in different habitat types and seems to be tolerant of habitat degradation.

Notes: West African plants have smaller spikelets than Central African ones (Napper 1972). Goetghebeur & Coudijzer (1985) also mentioned that specimens from most parts of Central Africa are clearly annual, while collections from Katanga show a caespitose perennial habit.

Bulbostylis tisserantii Cherm., Arch. Bot. Mém. 3: 11 (1936).

≡ *Bulbostylis fasciculata* Cherm., Arch. Bot. Mém. 7: 36 (1931), nom. illeg. (non *B. fasciculata* Uittien, Recueil Trav. Bot. Néerl. 22: 338, f. 2a. 1925[1926]).

Type: lectotype, designated here: Tisserant C. 2695 (P00462614), Région de Bambari, Yanguya, 50 km S.E. Bambari, 21.09.1928 (image available at: <https://science.mnhn.fr/institution/mnhn/collection/p/item/p00462614>); isolectotype: P00462615, BR-863751.

A rather robust annual with ascending stem base, rooting at and branching from the lower nodes, or a tufted perennial with centrifugal growth. Stem 80–100 cm long, 0.7 mm thick, swollen at base, ridged, glabrous; leaf sheaths straw-coloured to reddish brown or purplish, glabrous to shortly hairy with 5–10 mm long hairs at orifice, leaf blade flexuous, 0.4 mm wide, 25–35 cm long. Inflorescences compound (primary and secondary branches) with numerous spikelets; branches smooth, shortly hairy; bracts 3–4, erect, base with long hairs, 10–25 mm long; glumes 2.25–2.5 mm long, dark reddish brown to black with paler keel; stamens 3, linear, acute; style smooth, 3 branched; nutlet 1 mm long, obovoid-trigonal, finely and regularly punctulate-tuberculate, with very short style base.

Distribution: Only known from the southern part of the Central African Republic. It may also occur in the northern part of the Democratic Republic of Congo.

Habitat: The species was collected in dry grasslands on laterite.

Specimens examined:

Central African Republic: Région de Bambari, Yanguya, 50 km S.E. Bambari, 21.09.1928, Tisserant C. 2695 (P); Région de la Waka, Kaga Gumbiya, 40 km N. de Bambari, 03.09.1924, Tisserant C. 1628 (P); Région de Bambari, N. Maroubas, 25.06.1922, Tisserant C. 673 (var. *pilosa* M. Bodard) (P).

Conservation status:

Only three collections are known, the most recent dating back to 1928. Based on this we cannot evaluate the conservation status of this species (DD). This is probably not because *B. tisserantii* is so rare, but simply because this region is rarely explored. The habitat of this species is widespread in the southern parts of the Central African Republic.

Note: Tisserant 673 was annotated by M. Bodard in 1962 as the type of “var. *pilosa*”; however, he apparently never published this new variety. Apart from long hairs at the culm base, we did not find any differences from the type of *B. tisserantii*.

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