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The Introduction of Sugarcane in West-Central Africa: Insights from Comparative Bantu Word Histories

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Abstract

Due to the extreme scarcity of archaeological and historical data, little is known about the introduction of Southeast Asian crops such as banana, sugarcane, taro, and greater yam in Africa, nor about the role they played in the subsistence and lifeways of ancestral African communities. Therefore, in this article, we closely examine comparative lexical data as a source to reconstruct the history of sugarcane in West-Central Africa. We focus, more specifically, on one branch of the Bantu language family, i.e., West-Coastal Bantu, in conjunction with data from Bantu languages spoken in the Congo rainforest and further south. We argue that despite their shared origins, sugarcane and banana were not introduced into Africa as part of one single Southeast Asian package. Sugarcane made its way through West-Central Africa together with crops of American origin such as maize, cassava, peanut, common bean, and (sweet) potato as part of the so-called "Columbian Exchange", i.e., not earlier than the 16th century CE, while the ancestry of bananas in the Congo rainforest area probably goes back to the Early Iron Age, i.e., about 2,500 years ago.

Keywords: Central Africa; historical linguistics; lexical reconstruction; Southeast Asian crops; sugarcane; West-Coastal Bantu

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About the authors

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1 Introduction

Much uncertainty persists about the introduction of Southeast Asian crops into Africa and about the role they played in the subsistence and food systems of early African societies and in the development of agriculture in the continent (Power et al. 2019), not least because there is extremely little historical and archaeological data available. Several scholars have therefore turned to the study of African languages, most often Bantu languages, in order to trace ancient subsistence and food history (Ehret 1974, 1984; Vansina 1997; Schoenbrun 1998; Fourshey 2002; Bostoen 2005, 2006-2007, 2014; Maniacky 2005; Güldemann 2008; Ricquier & Bostoen 2010, 2011; Ricquier 2013; de Luna 2016; Güldemann & Winkhart 2022), including the chronology and pathways of dispersal of Southeast Asian crops, and most particularly the banana (De Langhe et al. 1994–1995; Philippson & Bahuchet 1994–1995; Rossel 1998; Blench 2009; Van Acker et al. 2021). Such research fits into a broader academic tradition of relying on word histories, and historical-comparative linguistics more generally, to reconstruct the deep past of Africa's oral societies, often in conjunction with other data sources such as oral history and archaeology (Ehret 1967; Ehret & Posnansky 1982; Vansina 1999, 2006; Bostoen 2007, 2017, 2020; de Luna et al. 2012; Ricquier 2017; Gonzales 2018; de Luna & Fleisher 2019).

When it comes to the history of imported Asian food crops, using linguistic data can be challenging, as Power et al. (2019, 364–367) highlight, due, amongst other reasons, to the absence of sufficiently representative linguistic evidence and the rareness of adequate historical-linguistic analyses. In Van Acker et al. (2021), the authors therefore focus on ancestral banana vocabulary in one specific branch of the Bantu family, i.e., West-Coastal Bantu (WCB), with the specific aim of reassessing the time depth of *Musa* spp. in Central Africa and how its diffusion is linked to the dispersal of Bantu languages and the people speaking them. Thanks to the well-established genealogical classification of WCB (Pacchiarotti et al. 2019), Van Acker et al. (2021) are able to infer, from the reconstructed histories of common WCB banana terms, that plantains played a key role in the subsistence economy of the communities speaking the most recent common WCB ancestor language, that is, the language spoken by the first Bantu speakers who migrated south of the Congo rainforest, assumedly around 2,500 years ago (Bostoen et al. 2015; Grollemund et al. 2015; Pacchiarotti et al. 2019). This article extends historical-linguistic research to WCB vocabulary for another Southeast Asian crop common in Africa, namely sugarcane. This crop, along with banana, taro, and greater yam, is commonly regarded as one of the most important examples of transcontinental exchanges in the tropics (Power et al. 2019).

Sugarcane is the common term used to refer to the different species of *Saccharum* within the *Poaceae* family. This plant family, previously known as the *Gramineae* family, is also called the grass family and includes other important food crops such as wheat, barley, maize, sorghum, and pearl millet (WFO 2023). All *Saccharum* species have sugary-rich stalks and are therefore often cultivated as a cash crop for sugar. Sugarcane was most likely first domesticated in New Guinea around 8,000 to 10,000 years ago (Grivet et al. 2004; Pompidor et al. 2021; Dinesh Babu et al. 2022) before spreading to other parts of the world through human migration and trade, initially to Island Southeast Asia, the Indian subcontinent, and China, and later to Northern Africa via India and Persia (Dinesh Babu et al. 2022). Sugarcane may have been a major source of carbohydrates for pigs and humans at the time of its origins (Daniels and Daniels 1993).

While early European accounts from the 17th century CE onwards testify to the widespread use of sugarcane in the African humid zone (Watson 1983), little is known about its introduction to Africa. Being a cash crop, and not a staple food, unlike other Southeast Asian crops such as banana, taro, and greater yam, it may have been cultivated for export and thus spread

through Indian Ocean commerce networks well before the first Europeans reached Africa's eastern equatorial coasts in the late 15th century CE (Power et al. 2019). In line with this scenario, a Persian introduction to Eastern Africa before the ninth century CE, possibly by Arab traders, has been proposd. (Watson 1983; Wigboldus 1994–1995). Power et al. (2019, 364) refer to tax records indicating that sugarcane was grown along the Euphrates, close to the African continent, in the seventh century CE, as well as to Egyptian papyri from the mid-eighth century CE that mention the crop. Historical records attest to its presence in Zanzibar from the tenth century CE onwards. The only available African archaeobotanical data go back to the same period, i.e., carbonized sugarcane remains from the Quseir al-Qadim site in Egypt, dated 1000-1200 CE (van der Veen and Morales 2011). The near-absence of sugarcane from archaeological sites from Africa is possibly due to the fact that its seeds are very small, difficult to identify, and preserve badly (Peter Coutros, pers. comm.). According to Klieman (2003, 179–180), Indonesians probably introduced sugarcane early in the first millennium CE to Eastern Africa, but there might have been a separate introduction to West-Central Africa, given that the crop has distinct names in the western part of the Bantu-speaking area. Although evidence from modern genetics, archaeology, and history suggests that sugarcane was already present on the African continent well before the arrival of Europeans in the 15th century CE, i.e., since at least the tenth century CE, it might have spread to certain regions as a cash crop only after their arrival. When it comes to West-Central Africa, several historical sources suggest that the introduction of this crop did indeed not happen before the Columbian exchange (Pigafetta 1591; Tuckey 1818; Vansina 1966; Randles 1968; De Busschere 1988; Bortolami 2012). In sum, there is no consensus on the introduction of sugarcane in Africa. As evidence from other disciplines turns out to be inconclusive, historical linguistics might shed some much-needed light on this matter.

This article is organized as follows: in §2 we present data and methodology, in §3 and subsections therein we consider the three most widespread terms for 'sugarcane' in WCB and determine which one can be reconstructed back to the protolanguage of this Bantu branch; in §4 we argue that protoforms with reflexes referring to sugarcane in modern-day languages might have originally designated an autochtonous African plant morphologically very similar to the imported sugarcane, namely elephant grass (*Cenchrus purpureus* (Schumach.) Morrone). In §5, we show that naming strategies for sugarcane in Bantu languages closely resemble those for American crops introduced as part of the Columbian Exchange. Conclusions are in §6.

2 Data and methodology

Although we consider data from Bantu languages spoken across the entire Congo rainforest, our main sample consists of 69 languages (123 doculects) belonging to what is known as the West-Western (Grollemund et al. 2015) or, more commonly, the West-Coastal Bantu (WCB) branch (Vansina 1995; Bastin et al. 1999; de Schryver et al. 2015; Pacchiarotti et al. 2019; Koile et al. 2022) of the Bantu language family. This branch covers parts of Gabon, the Republic of the Congo, the Democratic Republic of the Congo (DRC), and northern Angola. In the Appendix (available on the Open Science Framework repository at https://osf.io/a6ujy/), we list all WCB varieties (a variety is often represented by more than one doculect) in our study with their corresponding alphanumeric codes, the lowest phylogenetic subgroup to which they belong (see Figure 1), and the sources from which data were obtained.

Figure 1 is a schematic WCB family tree with the major subgroups according to the most recent lexicon-based phylogenies (de Schryver et al. 2015; Pacchiarotti et al. 2019). A basic understanding of internal WCB classification is crucial for a sound reconstruction of word

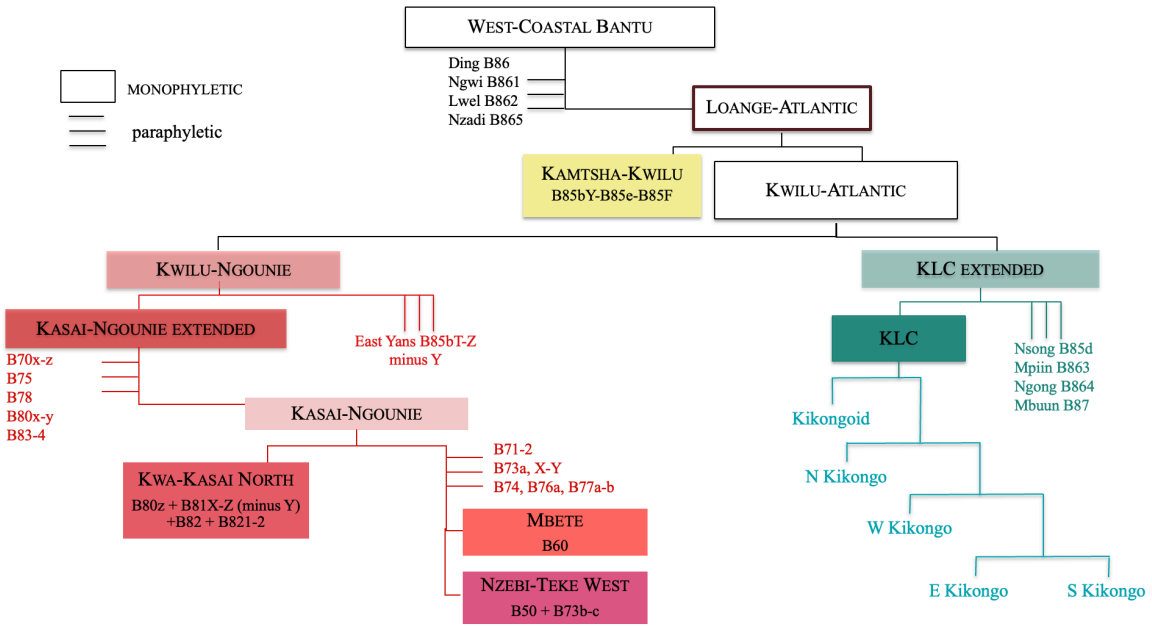
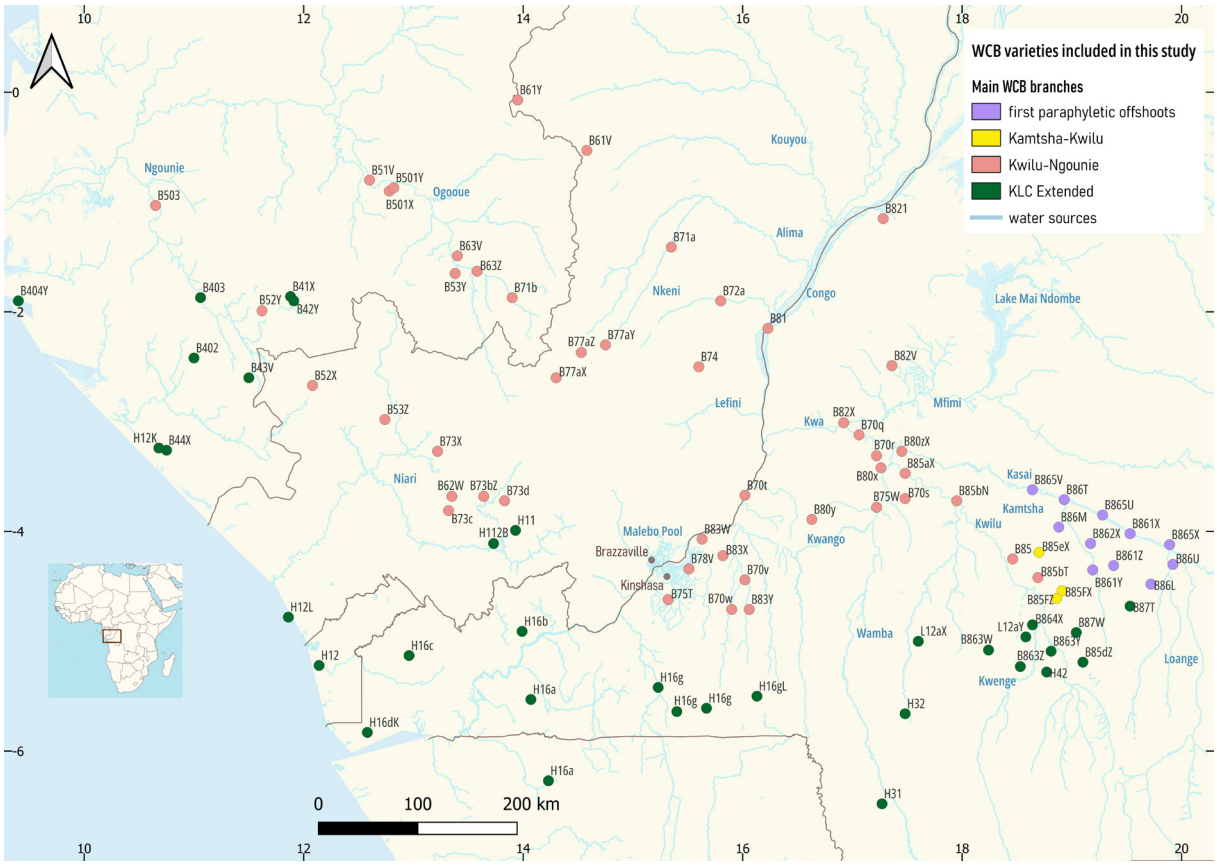


Figure 1: Internal lexicon-based phylogenetic classification of WCB (de Schryver et al. 2015; Pacchiarotti et al. 2019)



Map 1: Approximate geographic locations and phylogenetic affiliations of WCB varieties included in this study

histories. Checking the distribution of regularly inherited sugarcane terms against the subgroups in Figure 1 allows us to assess their relative time depth and to distinguish shared retentions inherited from the most recent common WCB ancestor from shared innovations that emerged at a later stage within this group of languages. Map 1 shows the approximate location of WCB varieties included in this study (see Appendix) and the main phylogenetic subgroups to which each variety belongs (see Figure 1).[1]

As historical records on the most recent common WCB ancestor language, estimated to be 2,500 years old, are inexistent, we need to rely on present-day comparative language data to reconstruct its lexicon and grammar. The reconstruction of proto-languages, i.e., historically unattested ancestral languages, is one of the main aims of the Comparative Method, a bottom-up approach which historical linguists have used for nearly two centuries to rebuild past languages from cognate lexicon and grammatical forms in their modern descendants, both in Africa and beyond (Baldi 1990; Durie & Ross 1996; Nurse 1997; Weiss 2015). Linguistic reconstruction endeavours to "reduce synchronic variation to earlier invariance and in doing so, to recover prehistoric linguistic changes" (Hock 1991, 581). The application of the Comparative Method to the Bantu languages has been relatively successful, among other reasons because their close relatedness facilitates the identification of shared vocabulary and grammar across languages. Additionally, lots of Bantu language data are available, certainly compared to many other African language families (Bostoen 2019, 208–209). Research on Bantu also benefits, particularly compared to research on other Niger-Congo languages, from the database Bantu Lexical Reconstructions 2/3, which consists of more than 10,000 reconstructed protoforms with variable time depths (Bastin et al. 2002; Bostoen & Bastin 2016).

All scientific plant names used in this article are taken from the World Flora Online database (WFO 2023), which contains the scientific name for each plant, along with synonyms, local names, general information, distribution maps, among others. For each plant, we provide the complete scientific name from the abovementioned website at first mention. Subsequently, we only mention the genus and species.

3 Sugarcane terms in WCB and beyond

In this section we review the four most widespread WCB terms for sugarcane and assess their geographic spread and distribution across genealogical subgroups, and the reconstructability of their stems and noun class prefixes to Proto-WCB (PWCB). We consider the roots in order of their frequency within WCB, from most frequent to least frequent, namely *còngù, *kùgú, *déngé, and *ncenga, followed by a summary of the main finds.

3.1 *còngù

The sugarcane term with the widest distribution in WCB is *còngù (BLR 5111) '*Graminaceous* spp.: *Gramineae* spp.', with attestations in Guthrie's zones B and C.[2] This term already occurs as a

[1] We slightly modified the latitude and longitude values of some varieties to prevent overlapping of points (see Appendix at https://osf.io/a6ujy/).

[2] In the predominantly geography-based referential Bantu classification by Guthrie (1971), languages are subdivided into 15 contiguous zones covering the entire Bantu area. Zones B and C comprise languages spoken in Gabon, Congo, the DRC, and the Central African Republic.

Bantu lexical reconstruction in Bastin et al.'s (2002) database. The root has a very wide distribution within WCB, but is limited elsewhere.

The WCB reflexes of *cùngù which we could identify are given in (1).[3] All attestations are translated as 'sugarcane' in the sources, except in Duma (B51V), where it is translated as 'sugar'. Reflexes occur in every single clade and subclade of the WCB branch. The term is also attested in the first paraphyletic WCB offshoots, that is, in individual modern languages which have no other more recent common ancestor than that of WCB itself. Hence, if the forms in (1) manifest regular sound correspondences, this root is a good candidate for reconstruction to PWCB. A close examination of its present-day distribution, combined with a diachronic phonological and morphological analysis, indicates that *cùngù can safely be reconstructed to Proto-WCB.

(1) WCB attestations of *cùngù (BLR 5111), meaning 'sugarcane'[4]

WCB	B86U *mu-sɔŋ*; B86T *mu-sɔŋ/mi-sɔŋ*; B86L *mù-sûŋ/mì-sûŋ*, B86S *mu-sɔŋ*; B865X *o-suŋ/e-suŋ*; B865U *ò-sûŋ/è-sûŋ*; B865V *mù-sûŋ/mì-sûŋ*; B862X *mə-suŋ*; B862X *ŋù-sûŋ/mì-sûŋ*; B861X *ò-ʃûŋ/è-ʃûŋ*; B861Y *ɔ̀-sûŋ/è-sûŋ*
Kamtsha-Kwilu	B85FX *ma-suŋ/me-suŋ*; B85eX *ɟ-sɔŋ*
Kwilu-Ngounie	B85bN *e-swɔ*; B85bN *mu-swuu*; B85bT *e-swɔ*; B85bT *mu-swuu*; B85aX *e-swo*; B85 *mu-song*
Kasai-Ngounie Ex	B70w *mú-sù/mí-sù*; B70v *mú-súù/mí-súù*; B70t *mú-súù/mí-súù*; B73d *mó-súù*; B75W *mu-suu*; B83Z *mú-súù*; B83W *mú-sù/mí-sù*; B80y *mù-ʃúù/mì-ʃúù*
Kasai-Ngounie	B71b *o-su/e-su [o-ʃu]*; B71a *ò-sùù/è-sùù*; B72a *ʃù/à-ʃù*; B73X *mú-súŋ/mí-súŋ*
Kwa-Kasai N	B82X *mu-cu:*; B82V *mù-cù:/mì-cù:*; B821 *mù-ʃúù/mì-ʃúù*; B81 *mò-sùù*
Mbete	B61V *ʃú:*; B61Y *o-cu/e-cu*; B61W *o-cu*; B62W *ó-sùù/é-sùù*; B63V *o-tsungu*; B63Y *o-cu/e-cu*[5]

[3] For greater readability, we add a historically informed morphological segmentation to synchronic reflexes throughout this paper by separating one or more historical noun class prefixes from the root with a hyphen. This diachronically informed segmentation may not always hold true synchronically for all the languages in question. As for tone, whenever data comes from first-hand fieldwork, we mark H(igh) tone as [á], L(ow) tone as [à], F(alling) tone as [â], and R(ising) tone as [ǎ]. In the case of second-hand sources, we adopt the tone notation established in the source. In many sources used in this paper, H tone is marked (as [á]) but L tone is left unmarked. Some second-hand sources do not indicate tone at all.

[4] In examples showing the distribution of terms for sugarcane in WCB, we use the following conventions: underlining for major WCB branches, with WCB standing for the first paraphyletic offshoots at the very top of the WCB tree (see Figure 1); SMALL CAPS for first level subgroups within the main branches; *italics* for second level subgroups within the main branches; and (smaller) regular font for third level subgroups within the main branches. Within the Kikongo Language Cluster (KLC), KK stands for Kikongoid, W for West, E for East, N for North, C for Central, and S for South.

[5] An anonymous reviewer wonders about the difference in vowel length among the reflexes within the Kasai-Ngounie Extended branch. Most languages for which we have first-hand fieldwork data have a long vowel [u:], which is the result of V1 and V2 of *cùngù becoming adjacent after the loss of C2 *ng. There are two possible ways to account for varieties which appear to have reflexes with a short vowel; see e.g., B61W *o-cu* and B63Y *o-cu/e-cu*. Data for some of the varieties with a short vowel come from older dictionaries, e.g., Adam (1954) for B61W and Biton (1969) for B63Y, where vowel length is never indicated. In other cases, first-hand fieldwork suggests that CVV shapes originating from the loss of a nasal+consonant cluster in C2 position (*CVNCV) might undergo loss of the second vowel segment, see, e.g., B70w *mú-sù/mí-sù*. Although we have not investigated this in detail, the elision

	Nzebi-Teke W	B503 -B52W *mu-sungu*; B501Y *mù-sùŋgù/mì-sùŋgù*; B51Z *mù-sùŋgù/mì-sùŋgù*; B51V *mu-sungu* 'sugar'; B52Y *-sùŋgù*; B53Y *mù-sùŋgù/mì-sùŋgù*; B73BZ *mɔ́-súngɔ̀/mɛ́-súngɔ̀*; B73C *mú-súngù/mí-súngù*
KLC Extended		B87W *ó-súŋ ~ ú-súŋ*; B87T *ɔ́-soŋ*; B864X *mó-sṵ̱ː, mú-súŋ*; B863Y *mú-súŋ ~ mu-swʃ́*; B863W *mi-sung*; B85DZ *ǫ́-suŋ*
KLC -	KK	L12AX *mu-súngu*
	N	H11 *mu-sungu*; *mu-suŋgu*
	W	B402-B403-B404Y-B41Y-B42Y-B43X-B44X *mu-sungu*; B43Z *mu-sŭngu/mi-sŭngu*

Formally speaking, all reflexes of *cùngù in (1) are in line with the regular diachronic sound changes undergone by the languages in which they are found. As for the first root consonant (C1), all attestations manifest the regular reflex of *c, i.e., /s/ everywhere, except in East Ngwi (B861X), where it is /ʃ/ in front of /i/ and /u/, and in North Boma (B82X), where it is /c/.[6] In all languages, this is what is expected, as illustrated in (2), (3), and (4) on the basis of other roots starting with *c. Note that in some languages, the previous presence of the homorganic nasal prefix N- of class 9/10 caused fortition of the fricative before disappearing: *s > [ts]/N_; see, e.g., B73c *li-saala/tsaala* (class pairing 11/10).

(2) **BLR 406 *cádá 'feather'** > B86S *i-sal* 'mane, dorsal fin', B865X *lɛ-sál ~ ɛ-sáá*; B862X *lə-sál*; B861X *è-sía*; B85FX *lá-sal*; B85eX *lí-sal*; B85bT *le-sál*; B75W *n-saa*; B83Z *í-saa* 'mane, dorsal fin'; B82X *ɛ-sɛ́ː*; B63X *tʃala*; B51X *lí-tsálà*; B52Y *lə̀-sâlà*; B53Z *li-sala*; B73c *li-saala*; B87W *lá-sal*; B864X *li-tsal*; B863Y *ló-sal*; B85dZ *lɔ́-sal*; L12a *tsala*; H11 *lu-sála*; B404Z *du-sala*; B41Z-B43Y *du-salə*; B42Mi *di-tsalə*; B42Mb *di-tsalə*; B44Y *du-salə*

(3) **BLR 724 *cònì 'meat; flesh'** > B85FX *má-sœn*; B85eX *u-sœn*; B85bT *mu-sun*; B75W *mu-sún*; B83X *mu-suna*; B863Z *mú-swín*; L12a *mu-súni*

(4) **BLR 5110 *cóngú 'tree; bark'** > B861Y *ɔ-suŋu*; B501X *í-sùːŋgù*; B52X *lɛ-suungu*; B53Z *i-suungu*; B73c *i-suunga*; B41Z *du-suŋgu*; B42Mi-B42Mb *di-suuŋgu*

The *cùngù attestations in (1) also manifest regular reflexes of the reconstructed second root consonant (C2) *ng. The prenasalized voiced velar stop is regularly retained in the KLC and in Nzebi-Teke West. In the Kwilu-Ngounie, Kasai-Ngounie Extended, Kasai-Ngounie, and Kwa-Kasai North branches,*ng is regularly lost in C2 (Pacchiarotti et al. forthcoming). In some eastern varieties of Yans B85, zero as the regular reflex of *ng in C2 position coexists with lexical items which have /ŋ/ instead of zero as a reflex of *ng; see, e.g., Lubini (1994), who gives *musong* as the term for sugarcane by Yans B85 speakers living between the Kwilu and Kasai Rivers; <ng> most likely represents [ŋ] here. This is likely because Eastern Yans (B85b) speakers live interspersed with speakers of other WCB languages such as Mpur (B85e), Nsambaan (B85F), Mbuun (B87), Ding (B86), Nsong (B85d), Lwel (B862), Ngwi (B861), Mpiin (B863), and Ngong (B864),

of the second vowel in these instances could be a hiatus resolution strategy. In some B70 varieties, a consonant is inserted in the resulting CVV shape (from a historical *CVNCV) to break up the sequence of two vowels (see Pacchiarotti et al. forthcoming for details).

[6] However, in East Ngwi B861, speakers produce /s/ as a free variant of /ʃ/ in front of /i/ and /u/, e.g., *ɔ̀ʃûŋ* 'tree' (< BLR5110 *cúngú) can be alternatively pronounced *ɔ̀sûŋ*.

which all have /ŋ/ as the regular reflex of *ng in C2 position (see Pacchiarotti et al. forthcoming for a detailed discussion); see Map 1. As for the Mbete (B60) languages, these prove to be very irregular when it comes to the reflexes of *ng in C2 position. Multiple reflexes for *ng have been attested, namely /ŋ/, /ŋg/, and Ø (see Pacchiarotti et al. forthcoming). The reflexes of *ng in C2 position in WCB are illustrated in (5) and (6).

(5) **BLR 1332 *gàngà 'medicine man'** > B86U *ŋ-ɣaaŋ a ŋkiir*; B865X *o-n-gaŋ*; B862X *ngə-n-gáːŋ*; B861X *ò-ŋ-gɛ́àŋ*; B85FX *n-gáŋ*; B85eX *ŋáŋ á nkis*; B85bT *n-gaa*; B70w *ŋ-gáà*; B70v *ŋ-gáà*; B70t *ŋ-gáa*; B70s *ŋ-gàá*; B70q *ŋ-gàà*; B75W *n-gâ ~ n-kyáːng*; B80x *ŋ-gàà*; B80zX *mu-n-gánga*; B71b *ŋ-gà*; B73c *n-gáángà*; B77aZ *n-gàà*; B77aY *n-gàà*; B87W *n-gáŋ*; B864X *n-gǵː*; B863Y *n-gǵː*;[7] B85dZ *n-gáŋ*; L12a *n-gănga*; H42 *n-gănng ú mwĕm*; H11 *n-gáangá*; B43V *i-n-ganga*; B44Z *N-gaanga*

(6) **BLR 1845 *kíngó 'neck; nape; voice'** > B865X *n-kíŋ*; B861X *n-kíŋ*; B70w *ŋ-kìì*; B70v *ŋ-kìì*; B70t *ŋ-kìi*; B70r *lè-kíí*; B75W *n-kii*; B83Y *ŋ́-kii*; B71b *n-kí*; B77aX *n-khíː*; B77aY *n-kíí*; B82Y *ǹ-kíɔ́*; B82Z *n-kyu*; B80zX *le-kiɛ*; B63Y *-tsingi*; B501X *lí-kìːŋgù*; B51X *lí-kíngù*; B52Y *là-kîŋgá*; B73c *kiingi*; L12a *tsingu*; H42 *tsiŋ*; H11 *n-kíingú*; B43Y *kiŋgu*

As for the first vowel (V1) of the root, *ʊ most often corresponds to /u/ in languages which underwent a 7 > 5 vowel reduction, whereby the 7 vowel phonemes of Proto-Bantu (/*i/ /*ɪ/ /*e/ /*a/ /*o/ /*ʊ/ /*u/) are reduced to 5 (/i/, /e/, /a/, /o/, /u/) by merging the two highest degrees of aperture, *u and *ʊ > /u/ and *i and *ɪ > /i/. This merger happened after a mutation of consonants triggered by the close vowels /*i/ and /*u/, known as Bantu Spirantization (Schadeberg 1995; Bostoen 2008; Bostoen & Goes 2019). This 7 > 5 vowel reduction took place in all languages belonging to the KLC (except in Hungan (H42), but this is irrelevant here), as well as in Yaa (B73c) (Bostoen and Goes 2019, 30) as an independent parallel innovation. In the languages belonging to the KLC Extended group, but not to the KLC itself, the vowel merger is not fully completed yet; *ʊ might therefore correspond to either /u/ or /ʊ/. In Mpiin (B863Y), for example, the reflex of *bútò is *mbʊr*; see (7). For the languages higher up in the WCB tree, *ʊ regularly corresponds to /u/ in languages which underwent the 7-to-5 vowel merger. It should be noted that WCB languages spoken in the homeland area have very complex vowel systems with up to 13 vowel phonemes, featuring phonemic rounded front vowels and central vowels, as well as umlaut phenomena triggered by a front vowel in V2 position (Khang Levy 1979; Ebalantshim Masuwan 1980; Bostoen & Koni Muluwa 2011, 2014; Pacchiarotti et al. 2021). However, detailed phonological accounts of the synchrony and diachrony of such systems are lacking. Moreover, there seems to be considerable variation in terms of vowel and consonant inventories between regiolects of allegedly one and the same language; see, e.g., the case of eastern and western Ngwi (Bwantsa Kafungu 1979; Pacchiarotti et al. 2021). Perhaps this is the reason why, in (1), the reflexes of *cùngù in Ding (B86), Mpur (B85eX), and Yans (B85b) are noted with different V1 vowels (/ɔ/, /o/, /u/). More apparently inconsistent vowel notations in one and the same language, as well as more regular reflexes of *ʊ in V1 position, are illustrated in (7) and (8).

(7) **BLR 351 *bútò 'seed'** > B86T *m-bɔt*; B86U *m-but*; B865X *m-búːr*; B862X *lə-búr*; B85FX *m-búr*; B85eX *m-bor*; B85bT *li-bɔ́r*; B75W *m-búru*; B83Y *ḿ-buru*; B71b *la-búlù*;

[7] In some varieties of Mpiin (B863), /ŋ/ is lost, with the compensatory development of nasalization and/or creaky voice on the remaining vowel.

B82X *mu-mbúrɔ*; B63W *m-bútù*; B501Y *lì-m-bútù*; B51X *ḿ-bűtú*; B52T *lù-m-bútù*; B53Y *m-bútù*; B87W *m-but*; B864X *m-but*; B863Y *m-bʊr*; B85dZ *m-but*; H11 *m-bútu*; B43W *di-búːrə*

(8) **BLR 1223 *dóngó 'red pepper; pepper'** > B861X *è-lúŋ*; B85FX *n-duŋ*; B85eX *n-dɔŋ*; B85bP *n-dóŋ*; B70w *n-dùù*; B70v *n-dùù*; B73d *n-dúú*; B75W *n-dzuu*; B83W *n-dùù*; B71b *o-n-dzú [ondʒu]*; B72a *n-dűű*; B61 *n-dwó*; B63Z *n-dú*; B501Y *n-dúúŋgú*; B503 *n-dungu*; B51W *n-dungu*; B51Z *n-dúúngú*; B52Y *n-dúúŋgú*; B53Y *n-dúúŋgú*; B73bZ *n-dúúŋɔ̀*; B73c *n-dűűngú*; B87W *n-dúŋ á ntân*; B85dZ *é-luŋ*; L12a *n-dungu*; H11 *ba-nʸúúngú*; B402 *nungu*; B403 *nungu*; B41Y *nungu*; B42Z *nungu*; B43V *du-nuungu*

The second vowel (V2) of the root is regularly lost in the WCB languages spoken in the wider WCB homeland area (Pacchiarotti and Bostoen 2021b). These are Yans (B85), Nsambaan (B85F), Nsong (B85d), Mpur (B85e), Ding (B86), Mbuun (B87), Ngwi (B861), Lwel (B862), Mpiin (B863), Ngong (B864), Nzadi (B865), and Hungan (H42). In all other languages final vowels are preserved. The regular reflexes of *ʊ in V2 position in WCB are illustrated in (8) and (9).

(9) **BLR 1532 *gùbó 'hippopotamus (Hippopotamus amphibius)'** > B86U *ŋ-ɣup*; B865X *n-gwùú*; B862X *n-gəb*; B861X *ŋ-gùú*; B85bT *n-gub*; B75W *n-gubu*; B73c *m-vûβú*; B87W *ń-gub*;B864X *ń-gub*; B863Y *ń-gub*; B85dZ *ń-gub*; B43V *m-vubu*; B44Z *N-fubu*

A final formal feature to be discussed is tone. As can be seen in (1), not all WCB reflexes of *cùngù have a tonal notation. If tone is noted, it is not straightforward in all sources/languages to determine how reliable it is, as tone notation sometimes varies across publications on one and the same language, e.g., East Nsong (B85dZ) *mósúŋ* (Koni Muluwa and Bostoen 2015) and *ǫ́suŋ* (Koni Muluwa 2014). It is hard to say whether the variation is regiolectal or simply a matter of inconsistency. Moreover, even when tone transcription appears to be consistent, a historical-comparative analysis is often impossible because the overall tone system of the language is unknown. However, the few WCB languages where tonal systems have been sufficiently described confirm the two low tones with which *cùngù was reconstructed. For example, in Punu (B43), the outcome of a Proto-Bantu LL stem tone pattern is a so-called "tonal type A" (Nsuka-Nkutsi 1980, 136–138), i.e., a low-toned noun prefix followed by a stem with a RL (rising-low) pattern. Some examples of this tone pattern are given by Nsuka-Nkutsi (1980, 136–138), e.g., *mìnà 'swallow' > *u-mĭnə*, *bèdò 'thigh' > *di-bĕlu*, etc. Hence, the Punu reflex of *cùngù, i.e., *musŭngu*, manifests the expected tone pattern. East Yans (B85b) is known to be tonally conservative, in that Proto-Bantu "tones of noun stems have been generally maintained" (Rottland 1977, 380). Hence, low tones on both the prefixes and stems of all East Yans (B85b) terms, which are left orthographically unmarked, are expected, e.g., B85bN *eswɔ*; B85bN *mu-swuu*. In East Ngwi (B861X) (Pacchiarotti and Bostoen 2021a; Pacchiarotti et al. 2021), most Proto-Bantu noun stems with a LL tone pattern underwent low tone dissimilation and resulted in a HL tone pattern, realized as falling tone on CVC roots, e.g., *dùmbù 'mouth' > *òdzûm*, *dùngì 'face' > *èlûŋ*, *kòmbò 'walking stick' > *ìkɔ̂m*, *gùdù 'leg' > *èkúù,* *nyàmà 'animal' > ɲâm, *dègè 'weaver bird > *èlɛ̂ʁ*, *dìmbò 'glue' > *òlîm*, *bòmà 'python' > *mbɔ̂m*. In other words, three languages with reliable tone data and belonging to distinct branches of the WCB family tree confirm the reconstructed *LL tone pattern on *cùngù. Due to regular correspondences both segmentally and suprasegmentally, and to its widespread

presence throughout the WCB tree, the root *cùngù seems to be a likely candidate for reconstruction to PWCB.

As for nominal morphology, most of the nouns in (1) belong to noun class 3 in the singular and 4 in the plural. Proto-Bantu prefixes for these classes have been reconstructed as *mù- and *mì- (Meeussen 1967). When given, the singular prefix of class 3 is *mə-*, *mu-, ɔ-, o-*, or *u-*. In Nsambaan (B85F), it is *ma-* (Mfum-Ekong 1979, 44) due to a phonological merger whereby PB CL1 *mù-, CL3, *mù-, cl6 *mà-, and CL18 *mù- all merged to *ma- in earlier stages of the language (Koni Muluwa and Bostoen 2015, 47). The plural prefix of class 4 is either *mi-*, *me-*, or *e-*. Across Bantu, plant names often belong to this noun class pairing (Creider 1975; Denny & Creider 1986; Maho 1999; Katamba 2003). Given that reflexes of *cùngù include reflexes of the Proto-Bantu noun class prefixes 3/4 across the different WCB branches, it is safe to reconstruct *mùcùngù/*mìcùngù to PWCB. Innovations in noun class morphology only occur in East Yans (B85), i.e., *e-swɔ* whose prefix is a reflex of Proto-Bantu noun class 7 *kì-.

3.2 *kùgú

A second sugarcane term attested in WCB and reconstructed by Bastin et al. (2002) is *kùgú (BLR 4998) 'sugar-cane: *Gramineae*: *Saccharum officinarum* L.', with attestations in Guthrie's zones A, B, and C. Although WCB includes many languages of Guthrie's zone B, we only found a few attestations in our sample, as can be seen in (10). This term is more widespread in languages belonging to Central-Western (CWB) and North-Western Bantu (NWB) branches in the lexicon-based phylogeny of Grollemund et al. (2015).

(10) WCB attestations of *kùgú (BLR 4998) meaning 'sugarcane'.

WCB	B86M *mú-kùkù*; B861X *ò-kùʁú/Ǹ-kùʁú*
KLC Extended	
KLC - E	H16g (Mbata) *mu-kúku/mi-kúku*; H16g (Mbeko) *mu-kúku/mi-kúku*

As can be seen in (10), the distribution of *kùgú within WCB is limited and scattered. It only occurs in two languages spoken in the homeland area, i.e., Ding (B86) and East Ngwi (B861X), and in a couple of East Kongo languages of the KLC. Such a patchy distribution could be indicative of archaic heterogeneity, i.e., an archaism inherited from PWCB that was entirely replaced by the more common root *cùngù. However, several irregularities in form indicate that we are almost certainly dealing with the distribution of a loanword. First, the *mu-/mi-* prefixes of the East Kongo terms are irregular reflexes of the Proto-Bantu *mù-/*mì- prefixes of classes 3/4, as both varieties underwent regular prefix reduction to homorganic *N-* in both classes (Bostoen and de Schryver 2015), so that if the East Kongo terms were regular we would expect the root *kúku* to be preceded by the prefix *ŋ-*. The Ding and East Ngwi terms are also clearly phonologically irregular in that they maintain their final vowel, a feature that is typical of loanwords in languages which underwent regular final vowel loss (Pacchiarotti and Bostoen 2021b). The maintenance of /k/ in C2 position in Ding also points to a borrowing, as the most common reflex of Proto-Bantu *k/*g in this language is zero (Pacchiarotti and Bostoen 2022). In East Ngwi, the borrowing has clearly undergone phonological nativization, as /ʁ/ in C2 is the regular reflex of Proto-Bantu *k/*g, while /k/ is mainly found in borrowings.

The most probable source of these borrowings is vehicular Kongo, also known as Kikongo ya Leta, which is the principal language of communication in the Kwilu Province (DRC), where Ding and East Ngwi are spoken, and in the Kwango Province, which is bordered by the areas where the East Kongo varieties Mbeko (H16g) and Mbata (H16g) are spoken. The term is indeed attested as vehicular Kongo in at least two sources, i.e., as *mùkùkú* in Swartenbroeckx (1973, 366) and as *mùkúkú* in Koni Muluwa and Bostoen (2015). Polis (1938) also reports *mukuku* as a more recent term for *muns(y)e* 'sugarcane' in Ntandu (H16g), the main variety of the East Kongo subgroup, to which Mbeko (H16g) and Mbata (H16g) also belong. The ultimate source of the term in vehicular Kongo must be situated outside of WCB, as no regular reflexes of *kùgú occur within WCB. The CWB languages of the central Congo rainforest are no doubt the most likely donors, possibly Lingala, with which (vehicular) Kongo has been interacting around Malebo Pool. In Kinshasa Lingala, sugarcane is called *kokó* (Meeuwis 2023). In older sources on upstream Lingala, it is recorded as *nkokó* (van Everbroecke 1969, 19). Whatever the ultimate origin of the term in WCB, it is obvious that it should not be further considered for reconstruction at any ancestral WCB stage.

3.3 *déngé

A third sugarcane term with a limited occurrence in WCB is *déngé. All attestations of this term are listed in (11). Just like the sugarcane terms stemming from *cùngù and *kùgú, those in (11) have noun class prefixes corresponding to the Proto-Bantu *mù-/*mì- of classes 3/4. The roots in (11) are attested as sugarcane terms in only a few languages of the Kwilu-Ngounie branch, all of them spoken in a restricted area of the DRC roughly delineated by the Kwilu, Kasai/Kwa, and Congo Rivers. It is probably a local and late innovation, a hypothesis supported by the fact that reflexes of *cùngù prevail as sugarcane terms elsewhere within Kwilu-Ngounie. In West Yans (B85a), Swartenbroeckx (1948) even reports *mulè* together with two other sugarcane terms, i.e., *muswuu* and *eswo*, both regular reflexes of *cùngù. We believe the terms in (11) to be reflexes of the root reconstructed by Bastin et al. (2002) as *déngé (BLR 7673) 'reed: *Gramineae* sp.' with reported attestations in Guthrie's zones C, D, and L.

(11) WCB sugarcane terms originating from *déngé (BLR 7673)

Kwilu-Ngounie	B85aX *mu-lè*
Kasai-Ngounie Ex	B70q *mò-léé/mì-léé*; B70r *mú-lè/mí-lè*; B70s *mù-léé/mì-léé*; B80x *mò-lèè/mì-lèè*
Kasai-Ngounie	
Kwa-Kasai N	B80zX *mu-lɛ*

Given that /l/ is the regular reflex of intervocalic *d in C1, as can be observed in (12) and (13), and the diachronic sound shift *ng > Ø in C2 is systematic in these Kwilu-Ngounie languages as shown in §3.1 for *cùngù, the sugarcane terms in (11) look like regular reflexes of *déngé. The long mid front vowel in several attestations in (11) suggests that we are indeed not dealing with a proto-root with a simple CV structure, as one could presume based on the attestations with a short vowel. Here we find a similar situation to the one discussed for the reflexes of *cùngù in (1). Reflexes with a long vowel unmistakably suggest that the original protoform contained a nasal+consonant cluster in C2, which was lost, i.e., *CVNCV > CVV (see footnote 5 for possible ways to account for reflexes with a CV structure).

(12) **BLR 973 *dímì 'tongue, language, flame'** > B70r *lè-lím*; B70s *lîm*; B80zX *le-lím*

(13) **BLR 773 *dà 'abdomen, intestines, pregnancy, inside'** > B70q *mò-là*; B70s *mù-là*; B80x *mù-là*

Taking into account the meaning 'reed' reported by Bastin et al. (2002) for *déngé, the terms in (11) probably underwent a relatively recent semantic shift from designating a reed-like species to being sugarcane terms. This assumption seems to be supported by the *déngé reflexes reported by Koni Muluwa (2014) as terms for '*Imperata cylindrica* (L.) P.Beauv.' or 'cogon/spear grass' in several WCB languages from the KLC Extended branch, spoken around Kikwit (Kwilu Province, DRC), i.e., Nsong (B85d) *ǰlɛŋ*, Mpiin (B863Y) *múlę*, Mbuun (B87W) *ólɛŋ*, and Hungan (H42) *múlɛ*. Nsambaan (B85F), a language spoken in the same area but belonging to a different WCB branch, i.e., Kamtsha-Kwilu, also has *málɛŋ* for '*Imperata cylindrica*' (Katona Makani 2017). Tege (B71b), a Kwilu-Ngounie language more closely related to the languages in (11), has *kalíé*/*elíé* 'grass sp., space covered with this grass species' (Linton 2013), which is also a reflex of *déngé, but with a different noun class compared to the terms in (11) and to those reported by Koni Muluwa (2014). In other Kwilu-Ngounie languages and in several WCB and SWB languages spoken around Kikwit (Kwilu Province, DRC) (Koni Muluwa and Bostoen 2015), the root occurs in terms referring to the bush or savanna, i.e., grassland, e.g., Buu (B70w) *mú-lìè*/*mí-lìè* (BantuFirst fieldwork, Kouarata 2021), Laali (B73b) *léɛ́ŋè*/*málɛ́ɛ́ŋè* (Bissila 1991), and Yaa (B73c) *lɛ́ɛ̋ngé*/*málɛ́ɛ̋ngé* (Mouandza 2001). In Kukuya (B77aY), the term changes meaning depending on the noun class in which it is found: *màlìè* refers to elephant grass, also known as 'false sugarcane' in French, i.e., *fausse canne à sucre*, while *ùlìè* refers to grassland (BantuFirst fieldwork missions, Guy Kouarata 2021–2022). In Bushong (C83, CWB), *ilélyéɛŋ* has been reported as a term for 'reed' (Vansina 1959). In sum, the specific association of the *déngé root with sugarcane turns out to be a local and recent development and thus not diagnostic of the early history of this food crop in the study region.[8]

3.4 *ncenga

A last series of potentially related sugarcane terms is listed in (14). Apart from two Kasai-Ngounie languages of the Kwilu-Ngounie branch, reflexes of *ncenga are mainly attested in several subgroups of the KLC.

(14) Kwilu-Ngounie
Kasai-Ngounie Ex B75S *mu-n-ce*; B78V *mú-n-tsɛ̀*
KLC Extended

[8] The same semantic shift seems to have taken place independently in a number of CWB and SWB languages where reflexes of *déngé also designate sugarcane, e.g., Mongo (C61) *bɔléngé* (Hulstaert 1966); Tetela (C71) *wenge* (Bush 1925); Ngangela (K12b) *mwenge* (Pearson 1970); Mbundu (R11) *omwenge* (Le Guennec and Valente 1972). In Pende (L11), sugarcane is even called *mwéngé-wá-phútú* 'the reed/grass of Europe' (Kakesa Kimbwambu 2018), which suggests that Pende speakers associate the introduction of the crop with European colonial times. The truncation of such compounds by dropping the determiner may have facilitated the lexeme's transfer from an indigenous grass to sugarcane. Strangely enough, in Lunda (L52), sugarcane is called *mwengi wanzovu* 'reed/grass of the elephants' (White 1957), seemingly referring to the indigenous *Cenchrus purpureus*, but possibly later being extended to the imported sugarcane, due to the striking morphological similarity between the two plants.

KLC – KK	H31 *n-tsa*; H32 *mu-n-tsa*; H42 *mù-ts ~ mú-tsɛ*
N	H112B *(mù-)n-sé*
S	H16a (S Kikongo) *mu-n-ze*; H16a (Sikongo) *mu-n-se*; H16a (Mboma) *mui-n-si*
C	H16b *mu-n-sie*
E	H16g *mu-n-sé*; H16gL *mu-tshá*
W	B44Z *mu-n-zeenga*; H12K *n-sénga*; H12L *m-senga*; H12 (Fiote) *mu-n-senga*; H16c *mu-tsenga*; H16c *mu-n-tsênga*; H16c *tséenga*; H16dK *mu-n-séenga*

We consider the terms in (14) as potentially related. However, if they have a shared history, they certainly do not descend regularly from a common ancestral form. To go by the phonologically longer roots, i.e., those in West Kongo, the original root would have had a shape like *ncenga and would have been preceded, as in the case of all other sugarcane terms treated so far, by a nominal prefix that is a reflex of Proto-Bantu *mù- of class 3. Positing *nc in C1 position is necessary to account for its affrication to /ts/ observed in some varieties and its voicing to /nz/ in others. As can be seen in (14), in none of the other languages is the root disyllabic. Such a reduction to a monosyllabic root can only be regular in the two Kasai-Ngounie varieties, i.e., Tio (B75) and Wuumu (B78) (KLC Extended). As discussed §3.1, the deletion of *ng in C2 position is regular in these two varieties. However, since the loss of *k in C2 position is also attested in Tio (B75) and Wuumu (B78) (Pacchiarotti and Bostoen 2022), these two terms could also be regular reflexes of the root reconstructed as *céké (BLR 9712) 'sugarcane', cognate with reported attestations in Guthrie's zones D and J (Bastin et al. 2002).

Whatever the case may be, none of the remaining terms from the KLC can be regular reflexes of either *ncenga or *céké. Hence, if they are related to the West Kongo and/or Kasai-Ngounie terms in (14), they can only be explained as Kongo (H10) borrowings from Teke (B70) languages, where *ŋg in C2 position was regularly lost. Under this scenario, the question remains as to why *ncenga reflexes were not also borrowed in West KLC languages but rather appear to be regular reflexes of a *ncenga protoform. This alleged contact-induced change between Teke (B70) languages and Kongo (H10) languages (other than West) must have started before 1652, as *munze* '*arundo*' (i.e., 'giant reed' according to Gledhill 2002, 71) is already attested in the oldest Kongo/Bantu dictionary (Van Gheel 1652). In fact, Obenga (1985) reports that the sugarcane in the Loango area, called *munze* or *munsye* in Kikongo, grows "excessively tall, tasty and juicy". Similar observations are found in Monteiro (1875). Since the term *arundo* designates a genus of coarse tall grasses found in warm climates (having conspicuous two-ranked long leaves and an erect panicle up to 60 cm or more in length), we believe that *munze* or *munsye* terms might have referred to a specific subtype of very tall sugarcane grown in specific areas of the Kongo and Loango kingdoms. According to Bruyns (1951), the term *minse* in some Kongo varieties refers to sugarcane wine, which is of importance because it is widely used at festivals, markets, weddings, and funerals as a replacement for palm wine. It is possible that this specific type of sugarcane was/is grown specifically to make wine. Although this evidence may point to the role of (language) contact in the spread of sugarcane in the Lower Congo region, it seems to be a relatively recent and local phenomenon with little relevance for the deep history of sugarcane in Central Africa. Another possibility is that the *ncenga* terms and the shorter *ntse* terms in (14) are not historically related, but rather evolved out of two distinct protoforms.

3.5 Summary

Our systematic historical-comparative review of sugarcane vocabulary in WCB indicates that only one common WCB term is potentially indicative of the deep history of sugarcane, i.e., *mùcùngù/*mìcùngù (class pairing 3/4), which is reconstructable to PWCB, the most recent common ancestor of all WCB languages. All other terms have a more recent sugarcane-related history in WCB.[9] Terms relatable to *kùgú 'sugarcane' (BLR 4998) made their way into a limited number of WCB languages via Kikongo ya Leta, the region's vehicular language, which ultimately acquired it through contact with languages of the central Congo Basin, possibly Lingala, another major *lingua franca* of this area. Likewise, terms potentially based on a common *ncenga*-like root also represent a relatively recent loanword series of little importance for the early history of sugarcane in Central Africa. Finally, the term *mùdéngé/*mìdéngé (class pairing 3/4) may have deep ancestry in WCB, but not as a sugarcane term. It originally referred to indigenous grasses and only shifted its meaning to sugarcane in a limited number of Congolese WCB languages spoken on and around the Batéké Plateau.

While reflexes of *mùcùngù/*mìcùngù are omnipresent in WCB, they are much less densely spread in other major branches of the Bantu family, such as North-Western Bantu (NWB), Central-Western Bantu (CWB) and South-Western Bantu (SWB).[10] However, as shown in (15), phonologically regular reflexes of *mùcùngù/*mìcùngù are not entirely absent from CWB and SWB as sugarcane terms. Although the presence of such reflexes in Mbala (H41) and Kwezo (L13), both spoken around Kikwit (Kwilu Province, DRC) in close vicinity to the WCB terms, could easily be due to contact, the CWB attestations point towards a deeper Bantu ancestry of the root.

(15) CWB Enga C315 *mo-soŋgo* (Motingea Mangulu 2008a); Sengele C33 *mo-soŋgo* (Motingea Mangulu 2001); Mɔ́yé C38 *mo-songo* (Motingea Mangulu 2008a); Liinja C60 *o-songo*/*e-songo* (Motingea Mangulu 2008b); Mongo C61 *bo-songo* (Hulstaert 1966); Ngando C63 *bo-songo* (Tuerlings 2008); Ndengese C81 *bo-songo* (Goemaere s.d.); Hendo C82 *o-soŋgo* (Ngonga-ké-Mbembe 2009)
SWB Mbala H41 *mu-suungu*; Kwezo L13 *mu-súngu* (Koni Muluwa and Bostoen 2015)

The reflexes of *mùcùngù/*mìcùngù in (15) point towards an ancestry that is older than PWCB. Nonetheless, the association of this term with sugarcane outside of WCB remains limited. In Bantu languages of the Congo rainforest, the most common sugarcane term is a reflex of the *kùgú root, as shown in (16). Just like with *cùngù, its reflexes most often have noun class

[9] The following are additional terms used for sugarcane in selected WCB varieties. More research is needed to understand their distribution and possible origins: B861Z *bvábva*, B861Y *ɔ̀bŭlə*, B85FX *máyɔbɔ*, B85FZ *másíŋ*, B75S *mufuu*, B75T *ɔ̀fùù̀*/*ì̀fùù̀*, B74 *ùfùà*, B73bZ *mbéndé*, B73bZ *nzáya*, B41X *dibera*, B42Y *dibera*, B43Z *dibérə*, B44X *mwandu*, B52V *libere*.

[10] The Bantu family tree in the phylogenies of Grollemund et al. (2015) and Koile et al. (2022) is one where major clades split off one by one from a backbone. The NWB branches split off before any other in both phylogenies. Similarly, the SWB branch is part of a superclade to which Eastern Bantu (EB) also belongs. This superclade splits off last in both phylogenies. The CWB and WCB branches display different topologies in the phylogenies of Grollemund et al. (2015) and Koile et al. (2022). While, in the first, WCB branches off after CWB, in the second CWB and WCB are parallel branches. Moreover, portions of what is CWB in Grollemund et al. (2015) cluster more closely with WCB in Koile et al. (2022).

prefixes that correspond to Proto-Bantu classes 3 and 4, i.e., *mùkùgú/*mìkùgú. Even if the systematic diachronic phonological analysis of the terms in (16) goes beyond the scope of the present article, its widespread distribution in both NWB and CWB languages, which are amongst the primary branches of the Bantu language family (Grollemund et al. 2015; Koile et al. 2022), suggests that the root has considerable time depth in Bantu. It is also attested in Pende (L11), a South-West Bantu language spoken around Kikwit (Kwilu Province, DRC), i.e., *mukhukhu* (Koni Muluwa and Bostoen 2015), but this could well be a borrowing from Kikongo ya Leta, just like the WCB attestations of *kùgú. Possible *kùgú-based sugarcane terms in Ubangi languages from the northern Bantu borderland, e.g., Zande *koko* (Gore et al. 1952) and Gbaya *ngɔga*, *ngɔka* (Bossengue et al. 2017), might be borrowings from neighbouring Bantu languages.

(16) NWB Londo A11 *è-kòkò*/*bè-kòkò* (Kuperus 1985); Akoose A15C *n-kogé* (Hedinger 2020); Duala A24 *mú-koké*/*mí-koké* (Helmlinger 1972); Bubi A31 *kóhó* 'caña' (Abad 1928); Basaa A43 *ŋ̀-kògo*/*mì-ŋ-kògo* (Njock 2019); Nen A44 *mò-kɔkɔ* (Dugast 1967); Eton A71 *ŋ̀-kóg*/*mì-ŋ-kóg* (van de Velde 2008); Ewondo A72 *ŋ̀-kóg* (Janssens 1993); Bulu A74a *n-kok*/*mi-n-kok* vs. *n-kok ntañgan* 'sucre' (Mathieu 1921); Fang A75 *kôkh* (Galley 1964); Gyeli A801 *n-gùɔ́*/*be-n-gùɔ́* (Grimm 2021); Makaa A83 (Pichon 1950) *n-kwàgé*/*i-n-kwàgə́* (Cheucle 2014); Bekol A832 *n-kwɔ̀g*/*mò-n-kwɔ̀g* (Cheucle 2014); Konzime Njem A84 *n-kwoʔó* (Cheucle 2014); A842 *n-kòʔó* (Cheucle 2014); Mpiemo A86C *à-gwōgɔ̀* (Cheucle 2014); Kwakum A91 *kòkɔ́*/*à-kòkɔ́* (Njantcho Kouagang 2018); Pólrì A92a (NW) *kùɔ̀*/*ɓè-kùɔ̀* 'sugar' (Wéga Simeu 2016); Mpongwe B11a *i-koko* (Raponda-Walker and Sillans 1995); Koya B22 *kookwɛ*/*mí-kookwɛ* (Medjo Mvé 2011); Tsogo B31 *mo-koko*/*mi-koko* (Raponda-Walker and Sillans 1995)
CWB Koyo C24 *mo-kóɣo* (Motingea Mangulu 2008a); Mboshi C25 *o-koo*/*i-koo* (Ndongo Ibara 2000); Lingala C30b *kokó* (Meeuwis 2023); Binza C321 *n-kokó* (Donzo Bunza Yugia 2015); Mɔ́yɛ́ C38 *n-kokó* (Motingea Mangulu 2008a); Mongo C61 *bo-kokó* (Hulstaert 1966)

In sum, the sugarcane terms reconstructable as *mùcùngù/*mìcùngù and *mùkùgú/*mìkùgú have a distribution that is mostly complementary and that represents most of the Bantu languages spoken in the Congo rainforest and immediately south of it. While *mùcùngù/*mìcùngù prevails within WCB, *mùkùgú/*mìkùgú is predominant outside of WCB, i.e., in NWB and CWB languages. With two ancient sugarcane terms covering most of the primary branches of the Bantu family, it would be reasonable to assume that sugarcane has a deep history in the Bantu speech communities of Central Africa. Nonetheless, as we discuss in Section 4, there are strong indications that sugarcane is not the original meaning of either *mùcùngù/*mìcùngù or *mùkùgú/*mìkùgú.

4 Elephant grass: sugarcane's Central African ancestor

One could conclude from the widespread distribution of sugarcane terms stemming from either *mùcùngù/*mìcùngù or *mùkùgú/*mìkùgú among the Bantu languages of Central Africa that this crop, of Asian origin, has a considerable time depth in the region's food history. This conclusion holds only if sugarcane was indeed the original referent of both terms, and not an indigenous African grass, as we have argued for *mùdéngé/*mìdéngé, whose association with sugarcane is much more recent and localized than is the case for *mùcùngù/*mìcùngù and *mùkùgú/*mìkùgú.

There are indeed indications that both roots may originally have referred to indigenous African plants of the *Poaceae* family.

With regard to *mùcòngù/*mìcòngù, Vansina (1990, 289–290) notes that it may be an older term for an indigenous grass, amongst other things because its distribution largely coincides with that of a genetic grouping within the Bantu family, namely WCB, although he does not mention WCB explicitly. He mentions, in the same breadth, the sugarcane root "*céngé, class 3/4, (all along the southern fringe of the forest and in southern Maniema)", which probably corresponds to the *ncenga loanword series we discussed in §3.4. In any event, as shown in (17), an association does indeed exist between WCB reflexes of the root *còngù and a grass of the *Poaceae* family indigenous to tropical Africa, i.e., *Cenchrus purpureus* Schumach., also known as elephant grass or napier grass in English, or *fausse canne à sucre* (false sugarcane) in French.

(17) WCB attestations of *còngù (BLR 5111) meaning 'elephant grass'

WCB	B86L *ŋ-kà mù-sûŋ/ŋ-kà mì-sûŋ*; B861X *ò-ʃûŋ è-lìmà/è-ʃûŋ è-lìmà*; B862X *ŋ-ká ŋə̀-ʃûŋ/ŋ-ká mìsûŋ*; B865V *ò-sûŋ è-lìmà/è-sûŋ è-lìmà*
Kwilu-Ngounie	
Kasai-Ngounie	
Kwa-Kasai N	B82X *è-cùcù/ŋ-cùcù*
Nzebi-Teke W	B503 *mu-sungu-a-ba-n-djigu*; B51W *mu-sungu-a-bakula*; B52W *musungu-a-ngoï*
KLC Extended	B864X *nkíkan musʉŋ*; B85dZ *n-ká a ǫ́-súŋ*; B863Y *mu-swɨ́ á m-bwéts*; B87T *ò-sôŋ à nîŋ*
KLC – W	B41Y *mu-sùngu bi-tsutsu*; B41Y *mu-sungu-ngòndju*; B402 *mu-sungu-bi-tsutsu*; B404Y *mu-sungu-a-ma-bambu*

Strikingly, all elephant grass terms in (17) involve the root *còngù in compound nouns, except for the North Boma (B82X) term *ècùcù/ŋcùcù*, whose root is a reduplication of the one for sugarcane, i.e., *mùcù/mìcù*, and which also belongs to another noun class. The only non-compound reflex of *mùcòngù probably referring to elephant grass has been found in the Mpiin (B863W) variety described by Tamutuku (2019), i.e., *musuŋ* '*Pennisetum* (to obtain a kind of traditional salt)', which he also lists as a term for sugarcane. WCB compound nouns for *Pennisetum purpureum* formed with a head noun that is a reflex of *mùcòngù have been found in Nzebi-Teke West and in the KLC Extended group, as well as in the paraphyletic languages – Ding (B86), Lwel (B862), Ngwi (B861), and Nzadi (B865) – at the top of the WCB family tree.

The lexical creation strategies underlying the compounds in (17) indicate that sugarcane really became the referent primarily associated with *mùcòngù in WCB. They all present elephant grass as a kind of wild or indigenous variety of sugarcane, or a type of sugarcane not meant for human consumption. In Ngwi (B861X) and Nzadi (B865V), *òsûŋ èlìmà* literally means 'sugarcane of the water spirits', and in Mpiin (B863Y), *muswɨ́ á mbwéts* means 'sugarcane of the river', both highlighting the riverine habitat in which elephant grass thrives. In Mbuun (B87T), *òsôŋ à nîŋ* means 'sugarcane of the bush', indicating that it grows outside of the cultivated world. In Nzebi (B52W), the determiner *ngoi* in *musungu-a-ngoï* is probably a reflex of *gòì 'leopard' (BLR 7154), an animal associated with the wilderness. In Duma (B51W), *bakula* in *musungu-a-bakula* is a reflex of *kúlà, which Mouélé (1997, 370) reconstructs for 'chimpanzee' in Proto-Duma (i.e., Proto-B50). It is not clear what *bandjigu* in Vili (B503) *musungu-a-bandjigu* stands for, but it is probably also an animal name, given the plural *ba-* prefix of class 2. It is possibly a misspelled reflex of *jògù (BLR 1607) 'elephant' (Bastin et al. 2002), which is the common elephant term in

the B50 languages (Mouélé 1997, 371). The determiner ***bitsutsu*** in the Shira (B41Y) and Varama (B402) terms is probably a reflex of *cúcú (BLR 698) 'chicken'.

It is also attested in the term which both languages have for *Jacquemontia paniculata* Hallier f. or *Ipomoea mauritiana* Jacq., i.e., ***mongu-bitsutsu***, which is native to Africa, as opposed to the import from America, *Ipomoea batatas* (L.) Lam. or sweet potato, which is called simply ***mongu***. We observe here the same pattern as for sugarcane and elephant grass, i.e., the simplex term, linked with the imported edible crop, and the compound with the indigenous African plant, not suitable for human consumption. It is not immediately clear what the determiner ***ŋgòndju*** in ***musungu-ŋgòndju*** 'elephant grass' means in Shira (B41Y), but the same determiner is attested in ***musafu-ŋgóndu***, referring to a *Scytopetalum* species in the same language,[11] as well as in close relatives such as Varama B402, Vungu B403, and Punu B43 (Raponda-Walker and Sillans 1995). The simplex term is a reflex of *cákú (BLR 9461) (Bastin et al. 2002) and refers to the *Pachylobus edulis* G. Don,[12] or safou plum, which is native to Africa (Bostoen 2014).

Finally, Ding (B86), Lwel (B862), Ngong (B864), and Nsong (B85d) have compounds in which the initial element is a reflex of *kààká (BLR 1685) 'grandparent' (Bastin et al. 2002). Koni Muluwa (2010, 233–234) describes the ancestor/grandparent metaphor as a common lexical strategy to create names for plants that resemble other plants which speakers perceive as better known or more useful. In contrast to what one might expect, the plant called 'grandparent of plant X' is not necessarily the plant with the longest history in the region. For example, in several Bantu languages spoken around Kikwit, the *Ficus elastica* Roxb. ex Hornem., which is native to Asia, is called the ancestor of the *Ficus thonningii* Blume, which is native to Africa. Likewise, the *Pachylobus buettneri* Guillaumin is called the grandparent of the *Canarium schweinfurthii* Engl., both being indigenous to Africa. When applied to *mùcùngù, the grandparent metaphor implies that Bantu speakers of the Kwilu Province (DRC) perceive elephant grass as resembling sugarcane, but less common and/or less useful, in line with the elephant grass compounds in the WCB languages. In other words, sugarcane has clearly triumphed over elephant grass as the principal referent associated with *mùcùngù.

Outside WCB, where other sugarcane terms prevail, i.e., mainly *mùkùgú/*mìkùgú, simplex *mùcùngù/*mìcùngù reflexes do occur as elephant grass denominators, e.g., Eton (A71, NWB) ***ìsɔ̀ŋ*** (van de Velde 2008) and Basaa (A43, NWB) ***ǹsòŋgò*** (Njock 2019). We have also identified partially reduplicated simplex reflexes as names for elephant grass, e.g., Akoose (A15C, NW) ***e'sisoŋè [e?sìsòŋ]*** (Hedinger 2020) and Lingala (C30b, CWB) ***sosongo***, which was also borrowed in Ngbaka (Ubangi) as a term for both *Cenchrus purpureus* and *Imperata cylindrica* (Konda Ku Mbuta 2012). Beyond Narrow Bantu, Babungo (Grassfields, Cameroon) ***nshɔŋ [nʃɔ̀ŋ]*** 'sugar cane which is not sweet' (Schaub 2018) is possibly a reflex of *cùngù referring to elephant grass, as is Yamba (Grassfields, Cameroon) ***sùsùŋ*** 'elephant grass; pulp inside elephant stalk; shoot eaten as soup' (Nebup and Hedinger 2019). Within Narrow Bantu, Bemba (M42, EB) ***musungu/misungu*** 'winnowing of millet; blooms of cereal' (Anonymous 1954) is probably also a reflex of *cùngù, but one that refers neither to sugarcane nor to elephant grass.

*mùcùngù/*mìcùngù is not the only term associated with elephant grass; *mùkùgú/*mìkùgú is another instance both within and outside WCB. Within WCB, our 2022 fieldwork identified ***ŋkùkú/ŋkùkú*** in Ngwi (B861Y) and ***ŋkùú/ŋkùú*** in Nzadi (B865V) as terms for *Cenchrus purpureus*,

[11] According to the Encyclopedia of Life (https://eol.org/pages/5026459), *Scytopetalum* is a genus of woody plants plants native to Western and Western Central Tropical Africa. They have capsule fruit which at maturity dehisces through fruit locules.

[12] The WFO 2023 reports this name as currently unchecked and awaiting taxonomic scrutiny.

as well as *kòó*/*àkòó* in Ngungwel (B72a, Kasai-Ngounie). In Ntandu (H16g, East Kongo), the compound *nkúkú-wuungu* refers to another grass, i.e., *Euclasta condylotricha* (Hochst. ex Steud.) Stapf also known as knobbed Euclasta or sandbur (Daeleman and Pauwels 1983). Outside of WCB, *ì≠gòó*/*aŋ≠gòó* in Gunu (A622, NWB) (Boyd 2019) and *ì≠gŏ:*/*àŋ≠gŏ:* in Tuki (A64, NWB) (Boyd 2016) have been identified as elephant grass terms, while in Duala (A24, NWB) *mukoko*/*mikoko* has been reported as a term for an undetermined grass (Helmlinger 1972) and *ekoko* in Lokonda (C61, CWB) for '*Eleusine indica* Gaertn.' (Konda Ku Mbuta 2012).

The two most common sugarcane terms in the Bantu languages of Central Africa, i.e., *mòcòngò/*mìcòngò and *mòkògó/*mìkògó, are both found across the region with reference to a wild indigenous grass species that closely resembles it, i.e., *Cenchrus purpureus* or elephant grass. This is also true for *lèntséé*/*ntséé*, a reflex of the *ncenga root discussed in §3.4, which means 'elephant grass' in the Congolese variety of Mbaama (B62), as well as for *màlyè* 'elephant grass' in Kukuya (B77aY), a reflex of *déngé (BantuFirst fieldwork, Guy Kouarata 2021–2022). This clearly shows that speakers of languages belonging to different Bantu branches establish a cognitive link between these two species of the *Poaceae* family, a native African one, i.e., elephant grass, and an imported Asian one, i.e., sugarcane. Strikingly, such a cognitive association with indigenous African plants has never been observed for bananas, another food crop of Asian origin with an even higher importance than sugarcane in Central African subsistence systems. None of three common banana terms reconstructed to PWCB in Van Acker et al. (2021), viz., *dì-ŋkòndò/*mà-ŋkòndò 'plantain', *dì-ŋkò/*mà-ŋkò 'plantain', and *kì-túká/*bì-túká 'bunch of bananas', bears any reference to native African plant species, not even *Ensete* spp., a native African wild plant belonging to the same *Musaceae* family as the banana. As we discuss in §5, the lexical pattern characterizing Bantu sugarcane terms is, rather, in line with that of food crops originating in the Columbian Exchange, i.e., "the exchange of diseases, ideas, food crops, technologies, populations, and cultures between the New World and the Old World after Christopher Columbus' voyage to the Americas in 1492" (Nunn and Qian 2010, 163).[13]

5 Sugarcane in Central Africa and the Columbian Exchange

Although the terms *mùcòngò/*mìcòngò and *mùkògó/*mìkògó have a deep ancestry in Bantu languages, they may have become associated with sugarcane, their main referent today, only at a much later stage. It is not unlikely that they originally designated an indigenous grass, most likely elephant grass, and became sugarcane terms through parallel semantic shift once this food crop, of Asian origin, was introduced and gained economic importance. Many newly introduced American crops bear names across the Bantu languages that originally designated and sometimes still designate indigenous plants.

The roots *jùgú and *kúndè, for example, have a long history in the Bantu family, possibly going back as far as Proto-Bantu, as terms for *Vigna subterranea* (L.) Verdc. (Bambara groundnut) and *Vigna unguiculata* (L.) Walp. (cowpea) respectively (Philippson and Bahuchet 1994–1995, 111; Bostoen 2014, 132; Bostoen and Koni Muluwa 2017, 245). Both of these are indigenous African legumes with centres of domestication outside of western Africa (D'Andrea

[13] We agree with an anonymous reviewer that semantic shifts based on resemblance in the domain of plant names are probably not linked to particular time periods such as the Columbian exchange, but might have taken place well before this event. We know, for instance, that similar lexical transfers took place between indigenous African cereals such as pearl millet (*Cenchrus americanus (*L.) Morrone), finger millet (*Eleusine coracana* (L.) Gaertn.), and sorghum (*Sorghum bicolor* (L.) Moench) (Bostoen 2006–2007).

et al. 2007; Basu et al. 2007). Nowadays, they have become the main terms for two legumes of American origin, i.e., the peanut (*Arachis hypogaea* L.) in the case of *jùgú, and the common bean (*Phaseolus vulgaris* L.) in the case of *kúndè. Other Bantu terms for Bambara groundnut and cowpea of more recent origin underwent the same parallel semantic shift towards peanut and common bean (Koni Muluwa & Bostoen 2015; Ricquier 2016; Bostoen & Koni Muluwa 2017). This is evidence for the strong cognitive link which Bantu speakers across Central Africa and beyond make between indigenous African legumes and their imported American counterparts.

Another telling case is the lexical transfer from yam (*Dioscorea* sp.), a tuber with many wild and domesticated species indigenous to Central Africa, to imported American tubers such as cassava (*Manihot esculenta* Crantz), sweet potato (*Ipomoea batatas*), or common potato (*Solanum tuberosum* L.), which Maniacky (2005) documents for several ancient Bantu terms. One widespread yam root, i.e., *bàdá, reconstructable to Proto-Bantu, is not only used to designate those American tubers, but also one specific yam species of Asian origin, i.e., *Dioscorea alata* L. Maniacky (2005) takes the fact that all reflexes of *bàdá designating this specific yam species are regularly inherited and mainly occur in western Bantu languages as strong evidence for the fact that *Dioscorea alata* was not imported through East Africa, as proposed by Alexander and Coursey (1969), but must have been present in West-Central Africa before the Bantu Expansion began. Nonetheless, an alternative hypothesis considered by Alexander and Coursey (1969) that it was introduced subsequent to the late 15th century, when the Portuguese started to navigate the Indian and Atlantic Oceans, does not seem inconceivable, particularly if one assumes a parallel lexical transfer from indigenous African yam to *Dioscorea alata*, as one does for tubers of American origin.

Sometimes ancient Bantu plant names may even undergo three cycles of lexical transfer. This is the case, for example, for *cángú, which can be reconstructed to Proto-Bantu, probably with reference to an indigenous grain, but not as a term for pearl millet (*Cenchrus americanus*) (Bostoen 2006–2007; Bostoen and Koni Muluwa 2017). It would later become the prevalent western Bantu term for pearl millet after this Western African cereal began spreading through Central Africa around 2,500 years ago (Kahlheber et al. 2009, 2014; Neumann et al. 2012, 2022). When maize (*Zea mays* L.) was introduced to Africa as part of the Columbian Exchange, reflexes of *cángú were one of the lexical strategies used recurrently and independently by Bantu speakers in West-Central and South-Western Africa to designate this American import. Consequently, regularly inherited reflexes of *cángú, manifesting regular sound correspondences, are found today meaning 'pearl millet' and/or 'maize', especially among SWB languages spoken in the savannas south of the Congo rainforest, where the the cultivation of pearl millet has persisted longer than in other areas. In WCB languages and CWB languages of the Congo rainforest, phonologically irregular reflexes of *cángú meaning maize are found. At the time when maize was introduced into Central Africa, pearl millet was no longer grown there. Therefore, *cángú reflexes from Bantu languages in the Lower Congo region accompanied the spread of maize to the Upper Congo region as loanwords (Bostoen 2006–2007).

If reflexes of *mùcùngù/*mìcùngù and *mùkùgú/*mìkùgú were indeed also transferred as plant names from elephant grass to sugarcane upon the introduction of this Asian food crop, their spread as loanwords was minimal – though not inexistent, as we have shown for *mùkùgú/*mìkùgú in WCB – because elephant grass was omnipresent across Central Africa, both in the Congo rainforest and in the savannas south of it. Nonetheless, when it comes to patterns of lexical transfer more broadly, common sugarcane terms in the languages of Central Africa clearly behave more like those for the American crops which made their way to the continent as part of the Columbian Exchange, than like the Bantu vocabulary for bananas, which,

just like sugarcane, are of Asian origin. We did not find evidence for semantic shifts like those observed for sugarcane in the case of banana terms in WCB: words referring to banana that are reconstructable to Proto-WCB are never used to refer to *Ensete* spp., a native African wild plant that belongs to the *Musaceae* family, just like cultivated bananas. This suggests that South-East Asian crops did not arrive on the African continent as a single package, as argued by Power et al. (2019), but have a divergent history of introduction and spread.

The naming strategies for sugarcane closely resemble those for other American crops in Bantu, which we know for sure were introduced as part of the Columbian Exchange from the 16th century CE onwards. Being a cash crop, sugarcane is a good candidate for dispersal along the same trade routes as American crops. Historical sources such as Tuckey (1818) and Bortolami (2012) argue that sugarcane must have been introduced into the wider region (Congo, DRC, Angola) during the Columbian exchange. Sources focusing on the history of specific areas, such as the island of Saõ Tomé, state that the cultivation of sugarcane certainly started as soon as the Portuguese settled on the island around 1485 (Pigafetta 1591; Vansina 1966; Randles 1968; De Busschere 1988). Vansina (1966, 21) argues that sugarcane became a staple in the lower Kasai area, where West-Coastal Bantu speakers of Sakata (C34), Mfinu (B83), and Boma Nku (B80y) are found (see Map 1) at about the same time as when manioc was introduced into the area, that is, in the 1600s. Later on, the Atlantic trade created a vast economic space in the western half of the forest zone, which was mostly visible in agricultural specializations such as the cultivation of tobacco, sugarcane, cassava, and raffia, among other crops (Vansina 1985, 31).

6 Conclusion

For this research, we collected extensive sugarcane vocabulary in as many present-day WCB languages as possible. Some of these terms could be linked to already existing lexical reconstructions in the BLR 2/3 database, i.e., *kùgú (BLR 4998), *cùngù (BLR 5111), *déngé (BLR 7673), and *céké (BLR 9712).

As we have discussed, WCB compound nouns literally translating as 'the grandparent of sugarcane' are used to refer to the indigenous *Cenchrus purpureus*, while non-compound nouns are used to refer to the imported *Saccharum officinarum* L. Because *Pennisetum purpureum* is indigenous to tropical Africa and attestations of *cùngù referring to this plant are found well beyond WCB, it is likely that this was the original meaning of *cùngù before the Proto-WCB stage. At some point in the history of Proto-WCB, sugarcane became an economically important crop and the meaning of *cùngù probably shifted to sugarcane. After this shift, the need arose to create compound nouns to distinguish 'elephant grass' from 'sugarcane'. The key question at this point is whether the shift in meaning from 'elephant grass' to 'sugarcane' happened before or at Proto-WCB stage, or independently and in a parallel way at later stages. Let us consider the first scenario, where the semantic shift from 'elephant grass' to 'sugarcane' took place before or at PWCB. In this case, the *cùngù reflexes referring to sugarcane were inherited from a shared ancestral language, which would indicate that PWCB speakers were already exploiting sugarcane when they emerged south of the rainforest at around 2,500 years ago. However, this approximate timing would be significantly older than what the available historical evidence suggests as the earliest attestations of sugarcane in Africa, i.e., from the seventh century CE in Egypt and the tenth century CE in Zanzibar.

In the second scenario, semantic shifts happened independently and in parallel fashion at later stages, which implies that sugarcane was probably introduced into the region after the languages split off at around 2,500 years ago. This crop became economically more important than

elephant grass, which is morphologically similar but lacks the sugar content for which sugarcane is known. Due to these formal similarities, the meaning of *cùngù broadened from referring only to 'elephant grass' to including 'sugarcane'. Subsequently, the need to differentiate between these two arose, and compound nouns were formed for elephant grass using a technique which is actively used in Bantu languages, e.g., 'grandparent of sugarcane', 'sugarcane of the water spirits', etc. Only a few remnants of the original meaning 'elephant grass' have been found in WCB, but this is probably due to the limitations of the available sources.[14] If the meaning of *cùngù shifted from 'elephant grass' to 'sugarcane' in a parallel way in different languages, then sugarcane was probably not part of the subsistence economy of the first Bantu speakers south of the rainforest. Considering that (i) this semantic (re)naming pattern is extremely common for crops linked to the Columbian Exchange, and (ii) several historical sources argue that sugarcane was introduced either during or after this historical period, i.e., not earlier than the 15–16th century CE, the second scenario seems to be more plausible than the first, as far as West-Central Africa is concerned.

References

Abad, Isidoro. 1928. *Elementos de la gramática bubi*. Madrid: Imprenta del Corazón de Mariá.

Adam, Jean Jerome. 1954. *Grammaire composée mbede, ndumu, duma*. Montpellier: Imprimerie Charité.

Alexander, J., and D.G. Coursey. 1969. "The Origins of Yam Cultivation." In *The Domestication and Exploitation of Plants and Animals*, edited by P.J. Ucko and G.W. Dimbleby, 405–425. Aldine: Chicago.

Anonymous. 1954. *The White Fathers' Bemba-English Dictionary*. London: Longmans, Green & Co. for the Northern Rhodesia & Nyasaland Joint Publications Bureau.

Baldi, Philip. 1990. "Introduction: The Comparative Method." In *Linguistic Change and Reconstruction Methodology*, 1–13. Berlin & New York: Mouton de Gruyter.

Bastin, Yvonne, André Coupez, and Michael Mann. 1999. *Continuity and Divergence in the Bantu Languages: Perspectives from a Lexicostatistic Study.* Tervuren: Royal Museum for Central Africa.

Bastin, Yvonne, André Coupez, Evariste Mumba, and Thilo C. Schadeberg, eds. 2002. *Bantu Lexical Reconstructions 3*. Tervuren: Royal Museum for Central Africa. Online database: https://www.africamuseum.be/nl/research/discover/human_sciences/culture_society/blr (accessed March 4, 2024).

Basu, S., J. A. Roberts, S. N. Azam-Ali, and S. Mayes. 2007. "Bambara Groundnut." In *Genome Mapping and Molecular Breeding in plants: Pulses, Sugar and Tuber Crops.*, edited by Chittaranjan Kole, 159–173. New York: Springer.

Bissila, Sylvie. 1991. «Description phonologique du ilaale (dialecte teke du Congo).» Mémoire de Diplôme d'Etudes Supérieures, Université Marien Ngouabi.

Biton, Alexandre. 1969. *Dictionnaire ndumu-mbede-français et français-ndumu-mbede. Petite flore de la région de Franceville (Gabon). Grammaire ndumu-mbede*. Bar-le-Duc: Imprimerie St-Paul pour l'Archevêché de Libreville.

Blench, Roger. 2009. "Bananas and Plantains in Africa: Re-Interpreting the Linguistic Evidence." *Ethnobotany Research & Applications* 7: 363–380.

Bortolami, Gabriele. 2012. *I Bakongo: Società, tradizioni e cambiamento in Angola*. Sassari: Università degli studi di Sassari.

[14] Proof of this can be found in the recent fieldwork in the Lower Kasai region of the DRC, where the WCB homeland is located. During this fieldwork, additional terms for elephant grass involving the root *cùngù were identified.

Bossengue, Dominique, Réné Baliwe, Jérôme Kpokolitsa, Victor Yalo, Isaac Mbonga, Robert Touka, Suzane Dengli, and Adam Huntley, eds. 2017. *Dictionnaire Gbaya – Français Français – Gbaya Version Provisoire*. Yaoundé: SIL-RCA.

Bostoen, Koen. 2005. "A Diachronic Onomasiological Approach to Early Bantu Oil Palm Vocabulary." *Studies in African Linguistics* 34 (2): 143–188.

Bostoen, Koen. 2006-2007. "Pearl Millet in Early Bantu Speech Communities in Central Africa: A Reconsideration of the Lexical Evidence." *Afrika und Übersee* 89: 183–213 [published in 2010].

Bostoen, Koen. 2007. "Pots, Words and the Bantu Problem: On Lexical Reconstruction and Early African History." *Journal of African History* 48 (2): 173–199.

Bostoen, Koen. 2008. "Bantu Spirantization: Morphologization, Lexicalization and Historical Classification." *Diachronica* 25 (3): 299–356.

Bostoen, Koen. 2014. "Wild Trees in the Subsistence Economy of Early Bantu Speech Communities: A Historical-Linguistic Approach." In *Archaeology of African Plant Use*, edited by C. J. Stevens, S. Nixon, Mary Anne Murray, and Dorian Q. Fuller, 129–140. Walnut Creek: Left Coast Press.

Bostoen, Koen. 2017. "Historical Linguistics." In *Field Manual for African Archaeology*, edited by Alexandre Livingstone Smith, Els Cornelissen, Olivier P. Gosselain, and Scott MacEachern, 257–260. Tervuren: Royal Museum for Central Africa.

Bostoen, Koen. 2019. "Reconstructing Proto-Bantu." In *The Bantu Languages (Second Edition)*, edited by Mark Van de Velde, Koen Bostoen, Derek Nurse, and Gérard Philippson, 308–334. Oxford: Routledge.

Bostoen, Koen. 2020. "Language and Archaeology." In *Oxford Handbook of African Languages*, edited by Rainer Vossen and Gerrit J. Dimmendaal, 972–982. Oxford: Oxford University Press.

Bostoen, Koen, and Yvonne Bastin. 2016. Bantu Lexical Reconstruction. In *Oxford Handbooks Online*. Oxford: Oxford University Press. https://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199935345.001.0001/oxfordhb-9780199935345-e-36.

Bostoen, Koen, Bernard Clist, Charles Doumenge, Rebecca Grollemund, Jean-Marie Hombert, Joseph Koni Muluwa, and Jean Maley. 2015. "Middle to Late Holocene Paleoclimatic Change and the Early Bantu Expansion in the Rain Forests of West Central-Africa." *Current Anthropology* 56 (3): 354–384.

Bostoen, Koen, and Gilles-Maurice de Schryver. 2015. "Linguistic Innovation, Political Centralization and Economic Integration in the Kongo Kingdom: Reconstructing the Spread of Prefix Reduction." *Diachronica* 32 (2): 139–185.

Bostoen, Koen, and Heidi Goes. 2019. "Was Proto-Kikongo a 5 or 7 Vowel Language? Bantu Spirantization and Vowel Merger in the Kikongo Language Cluster." *Linguistique et langues africaines* 5: 25–68.

Bostoen, Koen, and Joseph Koni Muluwa. 2011. "Vowel Split in Hungan (Bantu H42, Kwilu, DRC): A Contact-induced Language-internal Change." *Journal of Historical Linguistics* 1 (2): 247–268.

Bostoen, Koen, and Joseph Koni Muluwa. 2014. "Umlaut in the Bantu B70/80 Languages of the Kwilu (DRC)." *Transactions of the Philological Society* 112 (2): 209–230.

Bostoen, Koen, and Joseph Koni Muluwa. 2017. "Were the First Bantu Speakers South of the Rainforest Farmers? A First Assessment of the Linguistic Evidence." In *Language Dispersal Beyond Farming*, edited by Martine Robbeets and Sander Savelyev, 235–258. Amsterdam & Philadelphia: John Benjamins.

Boyd, Virginia Lee, ed. 2016. *Dictionnaire tuki – français*. Dallas: SIL International, https://www.webonary.org/tuki/ (accessed February 17, 2023).

Boyd, Virginia Lee, ed. 2019. *Gunu-French-English Dictionary*. Dallas: SIL International, https://www.webonary.org/gunu/ (accessed February 16, 2023).

Bruyns, Louis. 1951. *De sociaal-economische ontwikkeling van de Bakongo (gewest Inkisi)*. Brussel: Koninklijk Belgisch Loloniaal Instituut.

Bush, C.C. 1925. *Otetela and English Dictionary*. Wembo-Nyama: Episcopal Congo Mission.

Bwantsa Kafungu, Ofonobon Olocy Aatom. 1979. «Les formes nominales et verbales du ngwî de la Kamtsha-Loange (Bandundu/Zaïre).» Thèse de doctorat, Université Nationale du Zaïre, Institut Superieur Pédagogique Kinshasa/Gombe.

Cheucle, Marion. 2014. «Etude comparative des langues makaa-njem (bantu A80) : phonologie, morphologie, Lexique. Vers une reconstruction du proto-A80.» Thèse de doctorat, Université Lumière Lyon 2.

Creider, Chet A. 1975. "The Semantic System of Noun Classes in Proto-Bantu." *Anthropological Linguistics* 17 (3): 127–138. http://www.jstor.org/stable/30027283.

D'Andrea, A.C., S. Kahlheber, A.L. Logan, and D.J. Watson. 2007. "Early Domesticated Cowpea (*Vigna unguiculata*) from Central Ghana." *Antiquity* 81 (313): 686–698.

Daeleman, Jan, and Luc Pauwels. 1983. «Notes d'ethnobotanique ntandu (Kongo). Principales plantes de la région de Kisaantu: noms ntandu et noms scientifiques.» *Africana Linguistica* 9: 149–256.

Daniels, John, and Christian Daniels. 1993. "Sugarcane in Prehistory." *Archaeology in Oceania* 28 (1): 1–7.

De Busschere, Pascale. 1988. «Analyse des données archéologiques, ethnographiques et historiques relatives aux circuits d'échanges dans l'ancien royaume Kongo.» Mémoire de licence, Université Libre de Bruxelles.

De Langhe, E., R. Swennen, and D. Vuylsteke. 1994–1995. "Plantain in the Early Bantu World." *Azania* 29–30 (1): 147–160.

de Luna, Kathryn M. 2016. *Collecting Food, Cultivating People: Subsistence and Society in Central Africa*. New Haven: Yale University Press.

de Luna, Kathryn M., Jeffery B. Fleisher, and Susan Keech McIntosh. 2012. "Thinking Across the African Past: Interdisciplinarity and Early History." *African Archaeological Review* 29 (2–3): 75–94.

de Luna, Kathryn M., and Jeffrey B. Fleisher. 2019. *Speaking with Substance: Methods of Language and Materials in African History*. New York: Springer.

de Schryver, Gilles-Maurice, Rebecca Grollemund, Simon Branford, and Koen Bostoen. 2015. "Introducing a State-of-the-Art Phylogenetic Classification of the Kikongo Language Cluster." *Africana Linguistica* 21: 87–162.

Denny, J. Peter, and Chet A. Creider. 1986. "The Semantics of Noun Classes in Proto Bantu." In *Noun Classes and Categorization*, edited by Colette G. Craig, 217–239. Amsterdam; Philadelphia: John Benjamins.

Dinesh Babu, Kandhalu Sagadevan, Vardhana Janakiraman, Harunipriya Palaniswamy, Lakshmi Kasirajan, Raju Gomathi, and Thakku R. Ramkumar. 2022. "A Short Review on Sugarcane: Its Domestication, Molecular Manipulations and Future Perspectives." *Genetic Resources and Crop Evolution* 69 (8): 2623–2643.

Donzo Bunza Yugia, Jean-Pierre. 2015. «Langues bantoues de l'entre Congo-Ubangi (RD Congo): documentation, reconstruction, classification et contacts avec les langues oubanguiennes.» Thèse de doctorat, Université de Gand (UGent).

Dugast, Idelette. 1967. *Lexique de la langue tùnen, parler des Banen du Sud-Ouest du Cameroun*. Paris: Librairie C Klincksieck.

Durie, Mark, and Malcolm Ross, eds. 1996. *The Comparative Method Reviewed: Regularity and Irregularity in Language Change*. Oxford: Oxford University Press.

Ebalantshim Masuwan. 1980. «Esquisse grammaticale de la langue idiŋ à Káantsa.» M.A. dissertation, Université Nationale du Zaïre.

Ehret, Christopher. 1967. "Cattle-Keeping and Milking in Eastern and Southern African History: The Linguistic Evidence." *Journal of African History* 8 (1): 1–17.

Ehret, Christopher. 1974. "Agricultural History in Central and Southern Africa, ca. 1000 B.C. to A.D. 500." *Transafrican Journal of History* 4 (1–2): 1–25.

Ehret, Christopher. 1984. "Historical/Linguistic Evidence for Early African Food Production." In *From Hunters to Farmers: The Causes and Consequences of Food Production in Africa*, edited by John Desmond Clark and Steven A. Brandt, 26–36. Berkeley: University of California Press.

Ehret, Christopher, and Merrick Posnansky, eds. 1982. *The Archaeological and Linguistic Reconstruction of African History*. Berkeley: University of California Press.

Fourshey, Catherine Cymone. 2002. "Agriculture, Ecology, Kinship and Gender: A Social and Economic History of Tanzania's Corridor 500 BC to 1900 AD." PhD dissertation, University of California.

Galley, Samuel. 1964. *Dictonnaire fang-français et français-fang, suivi d'une grammaire fang*. Neuchâtel: H. Messeiller.

Gledhill, David. 2002. *The Names of Plants*. Cambridge: Cambridge University Press.

Goemaere, Alphonse. n.d. *Spraakleer van het Londengese*. Tervuren: Royal Museum for Central Africa.

Gonzales, Rhonda M. 2018. "Historical Linguistics: Words and Things." In *Oxford Research Encyclopedia of African History*. Oxford: Oxford University Press, https://doi.org/10.1093/acrefore/9780190277734.013.361.

Gore, E. C., M. J. Gore, and H. B. Bullen. 1952. *Zande and English Dictionary*. London: Sheldon.

Grimm, Nadine. 2021. *Grammar of Gyeli*. Berlin: Language Science Press.

Grivet, Laurent, Charles Daniels, Jean-Christophe Glaszmann, and Angélique D'Hont. 2004. "A Review of Recent Molecular Genetics Evidence for Sugarcane Evolution and Domestication." *Ethnobotany Research and Applications* 2: 9–17.

Grollemund, Rebecca, Simon Branford, Koen Bostoen, Andrew Meade, Chris Venditti, and Mark Pagel. 2015. "Bantu Expansion Shows That Habitat Alters the Route and Pace of Human Dispersals." *Proceedings of the National Academy of Sciences of the United States of America* 112 (43): 13296–13301.

Güldemann, Tom. 2008. "A Linguist's View: Khoe-Kwadi Speakers as the Earliest Food-producers of Southern Africa." *Southern African Humanities* 20: 93–132.

Güldemann, Tom, and Benedikt Winkhart. 2020. "The *Baakaa and Other Puzzles: Foraging and Food-Producing Peoples in the Western Central African Rainforest." *Anthropological Linguistics* 62 (3): 259–306.

Guthrie, Malcolm. 1971. *Comparative Bantu: An Introduction to the Comparative Linguistics and Prehistory of the Bantu languages. Volume 2: Bantu Prehistory, Inventory and Indexes*. Farnborough: Gregg International.

Hedinger, Robert. 2020. *Akoose – English Dictionary*. Dallas: SIL International, https://www.webonary.org/akoose/ (accessed February 15, 2023).

Helmlinger, Paul. 1972. *Dictionnaire duala-français, suivi d'un lexique français-duala.Langues et littératures de l'Afrique noire, 9*. Paris: Klincksieck.

Hock, Hans Henrich. 1991. *Principles of Historical Linguistics.* Second Edition, Revised and Updated. Berlin & New York: Mouton de Gruyter.

Hulstaert, Gustaaf. 1966. *Notes d'ethnobotanique mongo*. Bruxelles: Académie royale des sciences d'Outre-Mer.

Janssens, Baudouin. 1993. «Doubles réflexes consonantiques : quatre études sur le bantu de zone A (bubi, nen, bafia, ewondo).» Thèse de doctorat, Université libre de Bruxelles.

Kahlheber, Stefanie, Koen Bostoen, and Katharina Neumann. 2009. "Early Plant Cultivation in the Central African Rain Forest: First Millennium BC Pearl Millet from South Cameroon." *Journal of African Archaeology* 7 (2): 253–272.

Kahlheber, Stefanie, Manfred K.H. Eggert, Dirk Seidensticker, and Hans-Peter Wotzka. 2014. "Pearl Millet and Other Plant Remains from the Early Iron Age Site of Boso-Njafo (Inner Congo Basin, Democratic Republic of the Congo)." *African Archaeologial Review* 31 (3): 479–512.

Kakesa Kimbwambu, Guy. 2018. "Phytonymes et myconymes phende Mukedi : Onomasiologie et sémasiologie." Mémoire de licence, Institut Supérieur Pédagogique de Kikwit.

Katamba, Francis. 2003. "Bantu Nominal Morphology." In *The Bantu Languages*, edited by Derek Nurse and Gérard Philippson. In *Routledge Language Family Series*, 103–120. London & New York: Routledge.

Katona Makani, Blanchard. 2017. «Phytonymes et myconymes nsamban (Bantu B85F): Essai d'onomastique.» Mémoire de licence, Institut Supérieur Pédagogique de Kikwit.

Khang Levy, Nyi-m'shum. 1979. «Eléments de grammaire morphologique de la langue lwel.» Mémoire de licence, Université Nationale du Zaïre.

Klieman, Kairn A. 2003. *"The Pygmies Were Our Compass": Bantu and Batwa in the History of West Central Africa, Early Times to C. 1900 C.E. Social history of Africa*. Portsmouth, NH: Heinemann.

Koile, Ezequiel, Simon J. Greenhill, Damián E. Blasi, Remco Bouckaert, and Russell D. Gray. 2022. "Phylogeographic Analysis of the Bantu Language Expansion Supports a Rainforest Route." *Proceedings of the National Academy of Sciences* 119 (32): e2112853119.

Konda Ku Mbuta, Augustin. 2012. *Plantes medicinales de traditions: Province de l'equateur - R.D. Congo*. Kingshasa: Institut de Recherche en Sciences de la Santé I.R.S.S.

Koni Muluwa, Joseph. 2010. «Plantes, animaux et champignons en langues bantu. Etude comparée de phytonymes, zoonymes et myconymes en nsong, ngong, mpiin, mbuun et hungan (Bandundu, RD Congo).» Thèse de doctorat, Université libre de Bruxelles.

Koni Muluwa, Joseph. 2014. *Noms et usages de plantes, animaux et champignons chez les Mbuun, Mpiin, Ngong, Nsong et Hungan en RD Congo.Tervuren Series for African Language Documentation and Description*. Tervuren: Musée royal de l'Afrique centrale.

Koni Muluwa, Joseph, and Koen Bostoen. 2015. *Lexique comparé des langues bantu du Kwilu (République démocratique du Congo)*. Cologne: Rüdiger Köppe.

Kouarata, Guy Noël, Sara Pacchiarotti, and Koen Bostoen. 2023. «Nouvelle contribution a l'inventaire et la description des parlers teke (bantou, B70-80)». *Linguistique et langues africaines* 9(2): 1–33.

Kuperus, Juliana. 1985. *The Londo Word: Its Phonological and Morphological Structure*. Vol. 119. *Sciences humaines*. Tervuren: Royal Museum for Central Africa.

Le Guennec, Grégoire, and José Francisco Valente. 1972. *Dicionário português-umbundu*. Luanda: Instituto de Investigação Cientifíca de Angola.

Linton, Pauline, ed. 2013. *Latege-French Dictionary*. Dallas: SIL International, https://www.webonary.org/latege/ (accessed February 14, 2023).

Lubini, A. 1994. «Utilisation des plantes par les Yansi de l'entre Kwilu-Kasaï (Zaïre).» In *Proceedings XIIIth Plenary Meeting of AETFAT, Zomba, Malawi*, edited by J. H. Seyani and A. C. Chikuni, 53–74. Lilongwe: National Herbarium and Botanic Gardens of Malawi.

Maho, J. F. 1999. *A Comparative Study of Bantu Noun Classes*. *Orientalia et Africana Gothoburgensia 13*. Göteborg: Acta Universitatis Gothoburgensis.

Maniacky, Jacky. 2005. «Quelques thèmes pour "igname" en bantu.» In *Studies in African Comparative Linguistics, with Special Focus on Bantu and Mande*, edited by Koen Bostoen and Jacky Maniacky, 165–187. Tervuren: Royal Museum for Central Africa.

Mathieu, Charles. 1921. *Petit vocabulaire français-boulou*. Paris: Geuthner.

Medjo Mvé, Pither. 2011. *Introduction à la langue et la culture des chasseurs-cueilleurs Bakoya (Région de Mékambo, Gabon) avec un petit dictionnaire*. Cologne: Rüdiger Köppe.

Meeussen, Achiel Emiel. 1967. «Bantu Grammatical Reconstructions.» *Africana Linguistica* 3: 79–121.

Meeuwis, Michael. 2023. *Woordenboek Lingála - Nederlands - Lingála online*. Gent: Universiteit Gent. www.linganed.UGent.be.

Mfum-Ekong, Adiate. 1979. «Esquisse grammaticale yansi «parler ntsambaan» : phonologie et morphologie.» Mémoire de licence, Université Nationale du Zaïre.

Monteiro, Joachim John. 1875. *Angola and the River Congo*. London: MacMillan.

Motingea Mangulu, André. 2001. «Notes sur le Parler Sέŋgɛlɛ de Mbέlɔ (Maindombe-R. D. Congo).» *Annales Æquatoria* 22: 259–326.

Motingea Mangulu, André. 2008a. *Aspects du bongili de la Sangha-Likouala, suivis de l'esquisse du parler énga de Mampoko, Lulonga*. Vol. 4. Tokyo: Institute for the Study of Languages and Cultures of Asia and Africa (ILCAA), Tokyo University of Foreign Studies.

Motingea Mangulu, André. 2008b. «Esquisse du parler des Mɔ́ngɔ-Liinja d'Opala (Bantou C60–70).» *Annales Aequatoria* 29: 261–364.

Mouandza, Jean-Daniel. 2001. «Éléments de description du iyaa (parler bantu du Congo-Brazzaville).» Thèse de doctorat, Université de Nice Sophia Antipolis.

Mouélé, Médard. 1997. «Étude synchronique et diachronique des parlers dúmá (groupe bantu B.50).» Thèse de doctorat, Université Lumière Lyon 2.

Ndongo Ibara, Yvon Pierre. 2000. "The Phonology of Tsambitsɔ: Embɔsi dialect." MA thesis, Université Marien Ngouabi.

Nebup, Abraham Nwizine, and Robert Hedinger. 2019. *Yamba – English Dictionary*. Dallas: SIL International. https://www.webonary.org/yamba (accessed February 16, 2023).

Neumann, Katharina, Koen Bostoen, Alexa Höhn, Stefanie Kahlheber, Alfred Ngomanda, and Barthelémy Tchiengué. 2012. "First Farmers in the Central African Rainforest: A View from Southern Cameroon." *Quaternary International* 249 (6): 53–62.

Neumann, Katharina, Barbara Eichhorn, and Hans-Peter Wotzka. 2022. "Iron Age Plant Subsistence in the Inner Congo Basin (DR Congo)." *Vegetation History and Archaeobotany* 31: 481–509.

Ngonga-ké-Mbembe, E. Hubert. 2009. «Langage initiatique ohendo: phonologie et méta-phonologie des langues dérivées.» Thèse de doctorat, Radboud Universiteit.

Njantcho Kouagang, Elisabeth. 2018. "A Grammar of Kwakum." PhD dissertation, INALCO.

Njock, Pierre Emmanuel. 2019. Ɓàsàa – French – English – German Dictionary. Dallas: SIL International. https://www.webonary.org/basaa/ (accessed February 15, 2023).

Nsuka-Nkutsi, François. 1980. «Quelques réflexes du protobantou en punu.» In *Eléments de description du punu*, edited by François Nsuka-Nkutsi, 128–178. Lyon: Centre de Recherches Linguistiques et Sémiologiques (CRLS), Université Lumière-Lyon 2.

Nunn, Nathan, and Nancy Qian. 2010. "The Columbian Exchange: A History of Disease, Food, and Ideas." *Journal of Economic Perspectives* 24 (2): 163–188.

Nurse, Derek. 1997. "The Contributions of Linguistics to the Study of History in Africa." *Journal of African History* 38 (3): 359–391.

Obenga, Théophile. 1985. "Traditions et coutumes alimentaires kongo." *Muntu* 3: 17–40.

Pacchiarotti, Sara, and Koen Bostoen. 2021a. "The Evolution of the Noun Class System of Ngwi (West-Coastal Bantu, B861, DRC)." *Language in Africa* 2 (3): 11–67.

Pacchiarotti, Sara, and Koen Bostoen. 2021b. "Final Vowel Loss in Lower Kasai Bantu (DRC) as a Contact-Induced Change." *Journal of Language Contact* 14: 437–474.

Pacchiarotti, Sara, and Koen Bostoen. 2022. "Erratic Velars in West-Coastal Bantu: Explaining Irregular Sound Change in Central Africa." *Journal of Historical Linguistics* 12 (3): 381–445.

Pacchiarotti, Sara, Natalia Chousou-Polydouri, and Koen Bostoen. 2019. "Untangling the West-Coastal Bantu Mess: Identification, Geography and Phylogeny of the Bantu B50–80 Languages." *Africana Linguistica* 25: 155–229.

Pacchiarotti, Sara, Guy Kouarata, and Koen Bostoen. Forthcoming. "Phonological versus Lexical Evidence for Subgrouping: Word-final Lenition of Proto-Bantu *ŋg in West-Coastal Bantu." *Language Dynamics and Change*.

Pacchiarotti, Sara, Lorenzo Maselli, and Koen Bostoen. 2021. "The Emergence of Interior Vowels and Heterosyllabic Vowel Sequences in Ngwi (Bantu B861, DRC)." *Papers in Historical Phonology* 6: 107–146.

Pearson, E. 1970. *Ngangela-English Dictionary*. Morelos: Cuernavaca. Tipografica Indigena.

Philippson, Gérard, and Serge Bahuchet. 1994–1995. "Cultivated Crops and Bantu Migrations in Central and Eastern Africa: A Linguistic Approach." *Azania* 29–30 (1): 103–120.

Pichon, François. 1950. *Petite grammaire ewondo, avec exercises appropriés, suivie d'un petit manuel de conversation et d'un lexique*. Yaoundé: Mission Catholique de Yaoundé.

Pigafetta, Filippo. 1591. *Relatione del reame di Congo et delle circonvicine contrade tratta delli scritti e ragionamenti di Odoardo Lopez, portoghese*. Roma: B. Grassi.

Polis, Charles. 1938. *Lexique kikongo–français (manuscrit en neuf fascicules, dupliqué par stencil)*. Leuven.

Pompidor, Nicolas, Carine Charron, Catherine Hervouet, Stéphanie Bocs, Gaëtan Droc, Ronan Rivallan, Aurore Manez, Therese Mitros, Kankshita Swaminathan, Jean-Christophe Glaszmann, Olivier Garsmeur, and Angélique D'Hont. 2021. "Three Founding Ancestral Genomes Involved in the Origin of Sugarcane." *Annals of Botany* 127 (6): 827–840.

Power, Robert C., Tom Güldemann, Alison Crowther, and Nicole Boivin. 2019. "Asian Crop Dispersal in Africa and Late Holocene Human Adaptation to Tropical Environments." *Journal of World Prehistory* 32 (4): 353–392.

Randles, William G. L. 1968. *L'ancien royaume du Congo des origines à la fin du XIXe siècle.Civilisations et sociétés, 14*. Paris & La Hague: Mouton.

Raponda-Walker, André, and Roger Sillans. 1995. *Les plantes utiles du Gabon.*. Libreville: Fondation Raponda-Walker & Editions Sépia.

Ricquier, Birgit. 2013. "Porridge Deconstructed: A Comparative Linguistic Approach to the History of Staple Starch Food Preparations in Bantuphone Africa." PhD dissertation, Université Libre de Bruxelles.

Ricquier, Birgit. 2016. "A Foodie's Guide to Kongo Language History: Early Events, North versus South, and the Innovative West." *Africana Linguistica* 22: 107–146.

Ricquier, Birgit. 2017. "The 'Words and Things' Method." In *Field Manual for African Archaeology*, edited by Alexandre Livingstone Smith, Els Cornelissen, Olivier P. Gosselain and Scott MacEachern, 261–263. Tervuren: Royal Museum for Central Africa.

Ricquier, Birgit, and Koen Bostoen. 2010. "Retrieving Food History through Linguistics: Culinary Traditions in Early Bantuphone Communities." In *Food and Language*, edited by Richard Hosking, 258–269. Totnes: Prospect Books.

Ricquier, Birgit, and Koen Bostoen. 2011. "Stirring Up the Porridge: How Early Bantu Speakers Prepared their Cereals." In *Windows on the African Past: Current Approaches to African Archaeobotany*, edited by Ahmed G. Fahmy, Stefanie Kahlheber, and Catherine D'Andrea, 209–224. *Reports in African Archaeology*. Frankfurt am Main: Africa Magna Verlag.

Rossel, Gerda. 1998. "Taxonomic-linguistic Study of Plantain in Africa." PhD thesis, Landbouwuniversiteit Wageningen.

Rottland, Franz. 1977. "Reflexes of Proto-Bantu Phonemes in Yanzi (B85)." *Africana Linguistica* 7: 375–396.

Schadeberg, Thilo C. 1995. "Spirantization and the 7-to-5 Vowel Merger in Bantu." *Belgian Journal of Linguistics* 9: 71–84.

Schaub, Willi. 2018. *Babungo – English Dictionary*. Dallas: SIL International. www.www.webonary.org/babungo (accessed February 15, 2023).

Schoenbrun, David Lee. 1998. *A Green Place, a Good Place: Agrarian Change, Gender, and Social Identity in the Great Lakes Region to the 15th Century*. *Social history of Africa*. Portsmouth: Heinemann.

Swartenbroeckx, Pierre. 1973. *Dictionnaire kikongo et kituba-français: vocabulaire comparé des langages kongo traditionnels et véhiculaires*.Bandundu: Centre d'Études Ethnologiques de Bandundu (CEEBA).

Swartenbroeckx, Pierre 1948. *Dictionnaire kiyansi ou kiyei, langage des bayansi ou bayey de territoire de Banningville (district du Lac Léopold II) au Congo Belge*. Musée royal du Congo belge, Bruxelles.

Tamutuku, Alija. 2019. «Phytonymes et myconymes mpiin du groupement Ngweme.» Mémoire de licence, Institut Supérieur Pédagogique de Kikwit.

Tuckey, James Hingston. 1818. *Narrative of an Expedition to Explore the River Zaire, Usually Called the Congo, in South Africa, in 1816 : Under the Direction of J. K. Tuckey to Which Is Added the Journal of Professor Smith; Some General Observations on the Country and Its Inhabitants and an Appendix Containing the Natural History of That Part of the Kingdom of Congo through Which the Zaire Flows*. London: John Murray.

Tuerlings, William. 2008. *Longandó Dictionary. Longandó-English, English-Longandó*. Waitakere: Tuerlings.

Van Acker, Sifra, Sara Pacchiarotti, Edmond De Langhe, and Koen Bostoen. 2021. "Reconstructing West-Coastal Bantu Vocabulary as Evidence for Early Banana Cultivation in Central Africa." *Studies in African Linguistics* 50 (2): 285–325.

van de Velde, Mark L. O. 2008. *A Grammar of Eton*. Vol. 46. Berlin: Mouton de Gruyter.

van der Veen, Marijke, and Jacob Morales. 2011. "Summer Crops – from Trade to Innovation." In *Consumption, Trade and Innovation: Exploring the Botanical Remains from the Roman and Islamic Ports at Quseir al-Qadim, Egypt*, edited by Marijke van der Veen, 254–289. Brill.

van Everbroecke, René. 1969. *Le lingala parlé et écrit*. Kinshasa: Editions l'Epiphanie.

Van Gheel, Joris. 1652. *Vocabularium Latinum, Hispanicum, e Congense. Ad Usum Missionariorû transmittendorû ad Regni Congo Missiones*. Rome: National Central Library. Fundo Minori 1896, MS Varia 274.

Vansina, Jan. 1959. *Esquisse de grammaire bushong*. Tervuren: Musée royal du Congo belge.

Vansina, Jan. 1966. *Kingdoms of the Savanna*. Madison: University of Wisconsin Press.

Vansina, Jan. 1985. «Esquisse historique de l'agriculture en milieu forestier (Afrique Équatoriale).» *Muntu* 2: 5–34.

Vansina, Jan. 1990. *Paths in the Rainforest: Toward a History of Political Tradition in Equatorial Africa*. Madison: University of Wisconsin Press.

Vansina, Jan. 1995. "New Linguistic Evidence and the Bantu Expansion." *Journal of African History* 36 (2): 173–195.

Vansina, Jan. 1997. «Histoire du manioc en Afrique centrale avant 1850.» *Paideuma* 43: 254–279.

Vansina, Jan. 1999. "Linguistic Evidence and Historical Reconstruction." *Journal of African History* 40 (3): 469-473.

Vansina, Jan. 2006. "Linguistic Evidence for the Introduction of Ironworking in Bantu-Speaking Africa." *History in Africa* 33: 321–361.

Watson, Andrew M. 1983. *Agricultural Innovation in the Early Islamic World. The Diffusion of Crops and Farming Techniques, 700–1100*. Cambridge: Cambridge University Press.

Wéga Simeu, Abraham. 2016. *Grammaire descriptive du pólrì : Eléments de phonologie, morphologie et syntaxe*. Cologne: Rüdiger Köppe.

Weiss, Michael. 2015. "The Comparative Method." In *The Routledge Handbook of Historical Linguistics*, edited by Claire Bowern and Bethwyn Evans, 127–146. London: Routledge.

WFO. 2023. *World Flora Online*. http://www.worldfloraonline.org (accessed February 8, 2023).

White, C.M.N. 1957. *A Lunda-English Vocabulary*. London: University of London Press.

Wigboldus, J. S. 1994–1995. "The Spread of Crops into Sub-equatorial Africa during the Early Iron Age." *Azania: Archaeological Research in Africa* 29–30 (1): 121–129.