

ON THE ORIGIN OF TONAL CLASSES IN KINANDE NOUN STEMS*

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This paper investigates the Proto-Bantu origins of the principal tonal classes in Kinande nonderived mono- and disyllabic nominal stems. The ternary H vs. L vs. 0 distinction in the final syllable of the current language is traced back to a binary H vs. L contrast in Proto Bantu on the basis of two strata of reconstruction: first, a shallow one based on c. 200 PB cognates shared with the closely related Lacustrine languages Runyankore, Haya, and Jita, and second, a deeper one based on c. 100 PB cognates shared with the more distantly related Congolese languages Tembo, Luba, and Lingala. A chronology of tone changes is postulated in which different sequencing of the same changes as well as alternative phonologizations of ambiguous phonetic structures play a key role.

1. Introduction.

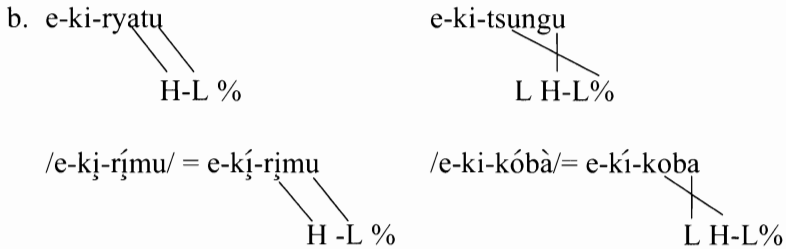
In one of the first investigations of the tonology of the Bantu language Kinande (D42), Hyman (1990) isolated the six contrasting tone patterns of (1a) for disyllabic noun stems.¹ They arise principally from a process shifting a high tone (H) one syllable to the left. In addition, to account for the contrast between the stable

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¹ There are actually a few additional minor patterns; see section 5. As a representative of the tonal class of *e-ki-hánde* ‘piece of cloth’ Hyman (1990) designates *e-ki-tábu* ‘book’ a Swahili loan ultimately from Arabic.

H of *e-ki-hánde* vs. the alternating H of *e-ki-ryátu*, the phrase-medial form appearing before the modifier *ḳi-ṛíto* ‘heavy’ is taken as underlying and a process that attaches H-L% boundary tones to the penultimate and last syllables of the phrase-final form is proposed. Words like *e-ki-tsungu* and *e-kí-koba* that block the attachment of the H-L% are assigned an underlying final low tone (L). As seen in (1b), this structure prevents the H% from reaching the penult by the ban on crossing autosegmental association lines. Kinande thus presents an underlying ternary /H-L-0/ contrast on the final syllable of disyllabic stems in this analysis.

(1) a. citation	phrase medial	gloss	lexical	type
e-ki-ryátu	e-ki-ryatu ḳi-ṛíto	shoe	/ryatu/	/00/
e-ki-tsungu	e-ki-tsungu ḳi-ṛíto	potato	/tsungù/	/0L/
e-ḳí-ṛímu	e-ḳí-ṛímu ḳi-ṛíto	spirit	/ṛímu/	/H0/
e-kí-koba	e-kí-koba ḳi-ṛíto	rope	/kóbà/	/HL/
e-ki-hánde	e-ki-hánde ḳi-ṛíto	cloth	/handé/	/0H/
e-kí-sáka	e-kí-sáka ḳi-ṛíto	branch	/sáká/	/HH/



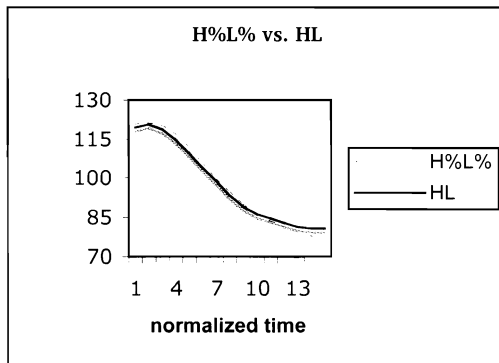
Given that Proto-Bantu (PB) nouns are reconstructed with four contrasting tonal shapes /HH, HL, LH, LL/ by Greenberg (1948) and Guthrie (1967-1971), the question of the diachronic origin of the Kinande stem classes arises. The goal of this paper is to shed light on this matter. The paper has three parts. First, we report the results of an analysis of c. 200 cognates shared between Kinande and several closely related Lacustrine languages based on the material in recently published lexicons of substantial (over 1,000 entries) size for J.31 Runyankore (Kaji 2004), K.12a Haya (Kaji 2000), and E.24, 25 Jita (Downing 1996 Ukwere dialect and Kagaya 2005 Mrangi dialect)—see Appendix A. Second, we explore the origin of the contrast between the final L of /kóbà/ vs. the 0 of /ṛímu/ based on the material in the lexicons for the more distantly related Congolese languages D.54 Tembo (Kaji 1986, 1996), L.31 Luba (Yukawa 1992), and C.36 Lingala (Kaji 1992), in order to evaluate the hypothesis of Meeussen (1976) that Kinande

/HL/ corresponds to PB HH while Kinande /H0/ corresponds to PB HL—see Appendix B. Third, we consider the implications of this result with respect to the presumed chronology of tonal changes that must have occurred in the development of Kinande from Proto-Bantu. Finally, we note various extensions of the /L/ vs. /0/ contrast in the contemporary Kinande lexicon.

2. Preliminaries.

In Kinande the attachment of the boundary H-L% to the penultimate and final syllables of the stem neutralizes the contrast with an underlying /HL/ stem. Thus, on the basis of the citation form, one cannot predict if the H on the penult will disappear (or shift), as in *e-ki-ryátu* ‘shoe’, *e-ki-ryatu k̄i-r̄j̄to* ‘heavy shoe’, or remain attached to that syllable, as in *e-ki-hánde* ‘cloth’, *e-ki-hánde k̄i-r̄j̄to* ‘heavy cloth’, as the phrasal context is altered. This surface ambiguity is at the basis of several lexical realignments discussed below. In order to substantiate the assertion that there is no phonetic difference between the two forms, we recorded and analyzed a sample of two repetitions of ten stems each from the two classes with the help of our consultant. No discernible difference in either peak height, alignment, or syllable duration was observed: cf. the normalized F0 contours over the last two syllables (employing a Praat script from Xu 2007) in (2).

(2) Time-Normalized F0 contours of H-L% vs. HL nouns



As a purely notational convenience, we follow Mutaka (1994) in transcribing the H% with the umlaut sign (thus, *e-ki-ryátu* ‘shoe’ vs. *e-ki-hánde* ‘cloth’). As seen in (2), there is no phonetic difference between these two structurally different tones.

Simplex (non-derived) nominals come in two basic varieties in Kinande: monosyllabic and disyllabic. As in most other Bantu languages, the latter class outnumbers the former by a considerable degree and indicates that CVCV is the canonical stem shape for nominals. In our hand count of the reconstructed nominal stems in Guthrie (1971), we find c. 998 disyllables vs. c. 111 monosyllables. As far as the disyllabic tonal classes of Proto-Bantu are concerned, they occur in the order /HL/ > /LL/ > /LH/ > /HH/ with the frequencies shown in the table below in (3a). In monosyllables, H outnumbers L. For purposes of comparison we show the Proto-Bantu reflexes that have survived into Kinande in (3b). The relative proportions are comparable to those in (3a) and provide some confidence that the inherited vocabulary more or less faithfully reflects their Proto-Bantu source with no obvious skewing.

(3) a. Proto-Bantu tonal classes (Guthrie 1967)

HL	LL	LH	HH	Total	H	L	Total
344	315	192	147	998	77	34	111
.34	.31	.19	.15		.69	.31	

b. Proto-Bantu reflexes in Kinande

HL	LL	LH	HH	Total	H	L	Total
78	52	28	24	182	14	10	24
.42	.29	.15	.13		.58	.42	

3. PB Reflexes in Kinande and Lacustrine Bantu.

We now turn to the reflexes of the PB tonal classes in our c. 200 word Kinande corpus, starting with the disyllabic stems.

3.1 HL. The corpus contains c. 80 PB HL stems from Guthrie (1967-1971) that have reflexes in Kinande. Over three-quarters are matched by cognates in Runyankore, Jita, or Haya. The regular Kinande correspondence is with a H on the syllable preceding the stem: 69/80. A few examples are shown below in (4). The first group comprises /H0/ stems that host the Kinande H% boundary tone and the second /HL/ stems which repel it. As we see, both classes regularly correspond to H0 stems in Runyankore, Haya, and Jita and to HL in the Guthrie reconstruction, posing an intriguing problem as to the origin of this apparent tonal split. We return to this puzzle in section 3.4. (Aside from the umlaut sign, our transcriptions are faithful to the source.)

(4) Reflexes of PB HL stems

<i>PB</i>	<i>gloss</i>	<i>Kinande</i>	<i>Runyankore</i>	<i>Haya</i>	<i>Jita</i>
gũt̀à	oil	amágũta	amajũta	amajũta	lifũ:ta
cũk̀à	hoe	eyĩsũka	efũka	enfũka	i:nsũka
pĩǹi	hoe handle	omũhiini	omuhini	omuũni	
dĩm̀i	tongue	olũlĩmi	orurĩmi	olulĩmi	olulĩmi
kát̀à	headpad	éngàta	engàta	engàta	i:ngàta
yúm̀à	iron	ékyũma	ekyô:ma	ekyô:ma	
yáǹà	child	ómwãna			omwã:na
kád̀à	charcoal	erĩkàla	i:kàra	eikàra	likàra
kíd̀à	tail	omukĩra	omukĩra	omukĩra	omukĩra
kũb̀à	chest	ekĩkũba	ekifũba	ekifũba	ecifũBa
tám̀à	cheek	eritẽma	i:tãma	eitãma	litãma
kób̀à	animal skin	ekĩkoba	ekikóba	ekikôba	
pém̀bè	horn	erĩhembe	i:hẽ:mbe	eiyẽmbe	liyẽ:mbe
kók̀ò	chicken	éngoko	enkóko	enkôko	i:nkóko
pũng̀ũ	eagle	ekĩhungu	empũ:ngu	ekiũngu	
tánd̀à	bed (for wood)	ekítanda	ekitã:nda	ekitãnda	ecitã:nda
tád̀à	granary	ekítara	ekitãra		ecitãra
bũmb̀à	clay	erĩbumba	i:bũ:mba	eibũmba	liBũ:mba
kũm̀ũ	medicine man	omũkũmũ	omufũmu	omufũmu	
pĩd̀à	pus	erĩhĩra			amã:ra
tég̀ò	trap	ekitego			omutégo

Thus, Kinande has retracted the H one syllable to the left on to the noun class prefix. If the latter lacks a vowel or has had its vowel devocalized before a vowel-initial stem then the H appears on the pre-prefix, as in *é-n-gàta* ‘headpad’ and *ómw-ãna* ‘child’. While one might wish to interpret the retraction as a response to crowding by the boundary H%, the fact that it regularly occurs in /HL/ stems that block the attachment of H% indicates that there is no direct connection between these two hallmarks—retraction to the prefix and H-L%—of the Kinande language.

We now turn to the exceptions to the regular correspondence. First, a handful of PB HL items appear with the toneless /00/ reflex in Kinande.

(5) /00/ reflexes of PB HL stems

<i>PB</i>	<i>gloss</i>	<i>Kinande</i>	<i>Runyankore</i>	<i>Haya</i>	<i>Jita</i>
kókò	crust	olukòko			oBukòko
kúmḽ	ten	erḽkūḽ	i:kúmi	eikūmi	
tétè	reed	ekitetè	omutè:te		omwitète

Seven items appear in the *e-ki-hánde* class (6). The first five are plausibly loans from penultimate-stress Swahili.² (The *bh* of *omubhángä* is a digraph indicating that the consonant is a stop; single *b* denotes a fricative intervocalically.)

(6) nonalternating /HL/ reflexes of PB HL stems

<i>PB</i>	<i>gloss</i>	<i>Kinande</i>	<i>Runyankore</i>	<i>Haya</i>	<i>Swahili</i>
cḽmbà	lion	eḽmbä			simba
kóópḽ	slap	erḽkófḽ			kofi
yánḽ	leaf	oluyánḽ			jani
kómbè	cup	ekikómbe		ekikómbe	kombe
pánḽgà	bushknife	omubhángä			panga
yḽnò	tooth	erḽno	erḽ:no	eḽno	jino
júbà	sun	eryúba	i:zò:ba	eizò:ba	jua

Finally, three PB HL stems *gímà* ‘monkey’, *tádè* ‘iron ore’, and *pácà* ‘axe’ have Kinande reflexes with a double H: *éngíma*, *erḽtále*, *émbása*. Most lack cognates in the closely related Runyankore, Haya, and Jita.

3.2 LL. The corpus contains 49 Kinande stems that reconstruct as PB LL. Forty-one have the expected development as the /00/ *e-ki-ryātu* category (N=37) or the /0L/ *e-ki-tungu* (N=4). A few examples are cited below in (7), with cognates

² It is interesting that as far as the Kinande citation form is concerned, the penultimate stress of Swahili would be compatible with either the phonologically stable high of *e-ki-hánde* or the boundary H% of *e-ki-ryātu*. Kinande systematically takes the first option. Runyankore makes a similar choice in its adaptation of Swahili (and English) loans. For example, in our hand count of the first fifty loans in Kaji’s (2007) Runyankore lexicon, we find only a handful of items in the alternating class (marked with an umlaut). The vast majority are adapted with the stable accent: *embará:si* < Sw *farasi* ‘horse’, *engámira* < Sw *ngamia* ‘camel’, but *kä:wa* (cf. *ka:wá yangye* ‘my coffee’) < Sw *kahawa* ‘coffee’. This adaptation may indicate a dispreference for alternating H or alternatively that the loan is adapted from a phrase-medial context in Swahili where the penultimate stress = high tone correspondence would require assigning the word to the nonalternating class in Kinande.

from Runyankore, Haya, and Jita, which also show this regular development. It manifests the frequently made observation that L tones tend to be inert in Bantu languages.

(7) /00/ and /0L/ reflexes of PB LL stems

<i>PB</i>	<i>gloss</i>	<i>Kinande</i>	<i>Runyankore</i>	<i>Haya</i>	<i>Jita</i>
mèdò	gullet	omumëro	omumiro	omumiro	limiro
gòmà	drum	engöma	engoma	engoma	i:ngoma
gùdù	leg	okugülu	okuguru	okuguru	okuguru
nàmà	muscle,meat	enyàma	enyama	eñama	i:ñama
gànjà	palm of hand	ekigänza	ekigaanja	ekiganja	ecigá:nja
bìdì	body	omubiri	omubiri	omubili	omubiri
tàkà	soil	ekitàka	i:taka	eitaka	litaka
dìdò	fire	omuliro	omuriro	omulilo	omuliro
gìgè	locust	engjike	enzigye	enzigye	i:njige
dàgò	mat	ekirago			echirago

The items in (8) have been reclassified into the *e-ki-hánde* class, suggesting that they have been reanalyzed on the basis of the ambiguous citation form. The first five are shared with the Kavutirwaki (1978) dictionary. The last two are the tone patterns assigned by our consultant; the dictionary retains the etymologically expected *enyöndo* and *enzögy*.

(8) stable /HL/ reflexes of PB LL stems

<i>PB</i>	<i>gloss</i>	<i>Kinande</i>	<i>Runyankore</i>	<i>Haya</i>	<i>Jita</i>
dèdù	beard	olulérũ	ekireju	ekileju	ecirefu
pũngà	wind	erihúnga	i:hu:nga		omuyaga
gèmbè	hoe	ekigémbe			
dèngè	leg	omuléngé			
gòngò	back	omugóngo	omugô:ngo	omugongo	omugo:ngo
yòndò	hammer	enyóndo	enyo:ndo	eñondo	i:no:ndo
jògù	elephant	enzógy	enjojo	enjoju	i:njofu

In this lexical restructuring we see that the stems have been reclassified on the basis of the ambiguous isolation form with a penultimate high tone. Thus, the smaller *e-ki-hánde* class attracts items from the larger *e-ki-ryätu* class in addition

to being the repository of Swahili loans. The reason presumably is that this tonal class is phonologically stable (no alternation).³

3.3 LH. Our corpus contains 24 reflexes of the PB LH class. It has a more varied outcome compared to PB HL and LL. Twelve items are reflected as the fixed penultimate H of *e-ki-hánde*, with a retraction of the final H. Several are matched by a Runyankore or Haya cognate whose final accent in phrase-medial position directly mirrors the PB source. Ukerewe Jita is most faithful to PB since it lacks the retraction of the H that is found in the phrase-final forms of Runyankore and Haya.

(9) stable /HL/ reflexes of PB LH stems

<i>PB</i>	<i>gloss</i>	<i>Kinande</i>	<i>Runyankore</i>	<i>Haya</i>	<i>Jita</i>
nùṅgú	pot	enyúngu	enyu:ngu	eñúngu	i:ñu:ngú
jòjá	bodyhair	olwéya	orwo:ya	omwó:ya	
pàndé	cloth	ekihánde		olupánde	
yíná	hole	ekyúna	omwi:na	ekí:na	eli:nâ
yòṅgó	brain	obóngó	obwongko	obwôngo	omwo:ngô
dùmíbí	long rain	omùlùmbj	omuju:mbi		
gùàdí	partridge	engwáli			i:nkwa:rê
yùmbá	house	enyúmbä		énju	i:ñú:mba
dòṅgó	mud	obudóngó	obudô:ngo	obudongo	

Six Kinande items in the class of PB LH reflexes display the double-H of *e-kí-sáka* ‘branch’ (10). Several of the Runyankore or Haya cognates belong to the phrasally alternating class (see (20) below) that reflects their LH provenance. They are marked here with an umlaut.

³ A similar phenomenon appears in Russian where loans systematically join the fixed accent class. The alternating (mobile) class is much smaller (c. 2% of the native Russian lexicon) and so the preference for the fixed class is ambiguous between frequency and stability. The Kinande data suggest that a stable phonological form can be decisive.

(10) double-H reflexes of PB LH

<i>PB</i>	<i>gloss</i>	<i>Kinande</i>	<i>Runyankore</i>	<i>Haya</i>	<i>Jita</i>
càká	bush	ekísáka	ekishaka	ekisháka	lisakâ
çìcá	vein	omŭsísá	omüsi	omüsi	
pápá	wing	ekí:pŭpa	i:papa	eipäpa	liBaBâ
pùká	insect	ekihúka	ekihúka	ekiüka	
tìkí	stump	ekísíki	ekisi:ku		ecisikî
yàtí	grass	obúnyátsi	orunyâ:nsi	akañâ:si	liñási

The Kinande stems in this tone-doubling class all have a voiceless medial consonant—a property that distinguishes them from the *e-ki-hánde* set in (9). Another one, pointed out by both SAL reviewers, is that the initial syllable of the stem in the items of (9) either begins with a glide or is followed by an NC cluster—both common (compensatory) lengthening sites in Bantu, as evidenced by the forms in Runyankore and Jita.

Two possible reconstructions of the single vs. double-high retraction seen in (9) vs. (10) present themselves. If voicing is the critical factor, we may posit a sound change spreading the word-final H to the preceding syllable that is blocked by an intervening voiced consonant. This is followed by the general H retraction that affected HL stems as well. The steps in (11) show this scenario.

(11)	/ki-búga/	/ki-saká/	/ki-pandé/	
	<u> </u>	ki-sáká	<u> </u>	Final H Spreading
	kí-buga	kí-sáka	ki-pánde	General H Retraction

Under the alternative interpretation shown in (12), the second mora of the lengthened vowel is the target of Final H Spreading. Then the more general retraction shifts Hs one mora to the left. Finally, long vowels are merged with short ones.

(12)	/ki-búga/	/ki-saká/	/ki-pandé/	
	<u> </u>	<u> </u>	ki-paandé	Vowel Lengthening
	<u> </u>	ki-sáká	ki-paandé	Final H Spreading
	kí-buga	kí-sáka	ki-páande	General H Retraction
	<u> </u>	<u> </u>	ki-pánde	Vowel Shortening

Both alternatives seem plausible on general grounds.⁴ They predict different outcomes for stems whose medial consonant is a plain voiced one with no glide onset. Under the first we expect a single H tone analogous to *ekihánde*, while the second predicts doubling in the manner of *ekísáka*. Our corpus contains three possible stems of this shape, which are listed below in (13).

(13)	<i>PB</i>	<i>Kinande</i>	<i>gloss</i>
	pàdí	embälj	ant
	gòdí	omúgóle	bride
	bògó	embögo	buffalo
		émbógo	
		embógo	

The Kinande reflexes are unfortunately varied and hence inconclusive. For ‘buffalo’ *embögo* is the tonal assignment offered by our consultant. The Mutaka and Kavutirwaki dictionary lists *embógo* as well as *émbógo*.

The four PB LH stems in (14) have joined the toneless class in Kinande and for the most part in Runyankore, Haya and Jita as well.

(14)	PB LH with Kinande toneless reflexes					
	<i>PB</i>	<i>gloss</i>	<i>Kinande</i>	<i>Runyankore</i>	<i>Haya</i>	<i>Jita</i>
	nònj	bird	enyönyu	ekinyonyi	ekiñoñi	i:ñoñi
	bògó	buffalo	embögo	embogo	embógo	i:m bogô
	pàdí	ant	embälj	empazi	obwa:zi	i:mpaji
	yèndá	nine	omwënda	omwenda	omwenda	

We conclude that for the PB LH class, the H is retracted from its etymological position as either a single (9) or double (10) peak. The split is based on either the voicing category of the medial consonant or alternatively on the length of the preceding vowel. Another important reflex of this class is that it resists the attachment of the H% to the final syllable. As we shall see, this behavior is distinct from the monosyllabic H. That is, while PB *dó* gives *e-kí-rö* ‘night’, *enyúngu* ‘pot’ < *nùngú* and *o-mú-sísa* ‘vein’ < *cìcá* block the H% attachment.

⁴ The majority of the Runyankore forms in (9) have a long vowel and also have no high tone. This might reflect a dispreference for rising tones **enyù.ngu* and final peaks **enyu:ngú* at the cost of deletion of the H.

3.4. PB HL vs. HH and the Kinande /H0/ vs. /HL/ Contrast. In a paper important to our topic, Meeussen (1976) called attention to certain inaccuracies in Guthrie's PB tonal reconstructions, especially with regard to the lexical items belonging to the PB HL and HH classes. Based on material in Greenberg (1948) and his own research, Meeussen proposed for example that Guthrie's HL reconstructions for *kadi* 'woman' and *kingo* 'neck' be replaced with HH while Guthrie's HH for *kige* 'eyebrow' be replaced by HL. More significantly for our purposes, in the course of his discussion Meeussen states that PB HH is reflected as Kinande H-LL while PB HL is reflected as Kinande H-HL. In other words, the apparent puzzling split of Guthrie's HL class into Kinande stems such as *o-mú-lüme* 'man' with a final /0/ that accepts the boundary tone vs. stems such as *o-mú-kali* 'woman' with a final /L/ that repels it can actually be traced back to the /HL/ vs. /HH/ distinction in Proto-Bantu.

In an effort to determine the viability of Meeussen's reconstructions as the basis for the Kinande *o-mú-lüme* vs. *o-mú-kali* contrast, we constructed a corpus of c. 100 Kinande cognates drawn from lexicons of the reversing languages Chi-Luba (Yukawa 1992) and Tembo (Kaji 1986) as well as Lingala (Kaji 1992). These are so-called "clear" languages in which the PB four-way tonal distinction is preserved and differ from Lacustrine languages such as Runyankore, Haya, and Jita which have merged HH and HL (Philippson 1998). In the reversing languages, PB H and L appear to have interchanged so that PB HH is reflected as LL and PB HL is reflected as LH. See Appendix B for the corpus.

Here are the results. We find a fairly regular correspondence (29/39) between Kinande /H0/ = H-HL% and PB HL (reflected as LH in the reversing languages). Some examples appear below, showing the Guthrie reconstruction. These correspondences suggest that PB *yáda* 'fingernail' and *dámú* 'sister-in-law' should be reassigned to the HL class.

(15) PB HL reflexes

<i>PB</i>	<i>gloss</i>	<i>Kinande</i>	<i>Tembo</i>	<i>Luba</i>	<i>Lingala</i>
dúmè	man	omúlüme	múlumé	múlumé	
dímì	tongue	olúlimi	lúlimí	lúdimí	lolémo
támà	cheek	erítëma	étamá	dítamá	litáma
béédè	breast	eríbëre	éberé	díbeelé	libéle
yáda	fingernail	ékyála		lwáalá	
kúpà	bone	eríkùha		máfufwá	mokúwa
kídà	tail	omúkira	múkirá	múkilá	mokíla
cúkà	hoe	eyísùka		nkasú	

kádà	charcoal	eríkàla	ékalá	díkalá	likála
búdà	rain	émbùla	m̀vulá	mvulá	mbùla
yótà	thirst	ényöta		nyootá	
jókà	snake	énzöka	ńzoká	nyoká	nyóka
túkù	day	obútükü	lúsukú	dítukú	
yánà	child	ómwána	mwaná	mwáaná	moána
nénè	bigness	obúnène	búnené	múnené	monéne
dámú	sister-in-law	omúlámu	múlamú		

For the smaller PB HH class, we have 19/21 correspondences between Kinande /HL/ = H-OL and PB HH (reflected as LL in Luba and Tembo). The forms marked M in the table below are Meeussen's (1976) alternative reconstructions to Guthrie's HL. The correspondences suggest that *bumba* 'clay' should be reconstructed as HH. The last two items are anomalous. Kinande *olúhala* is consistent with PB HH while the Tembo and Luba reflexes suggest PB HL, which should yield *olúhala* in Kinande. Luba *dípasá* is consistent with Guthrie's HL reconstruction but should give *omúhása* in Kinande. The words in the final column are from Lingala (L), Lomongo (M) or Bemba (B).

(16) PB HH reflexes

<i>PB</i>	<i>gloss</i>	<i>Kinande</i>	<i>Tembo</i>	<i>Luba</i>	<i>Lingala</i>
kádǐ(M)	woman	omúkajǐ	múkasi	múkaji	moási (L)
bumbà	clay	eribumba		lúpeemba	
kókó(M)	chicken	éngoko	ńgoko		kókó (M)
tumbí	chair, stool	ekítumbǐ	cífumbi		
yáyú(M)	yawn	émyaya		mwáau	
cíndí	squirrel	ekísindi		nshiindi	
kúpi	shortness	ekíkujǐ		bwíipi	
pídá(M)	pus	erǐhǐra	másira	túfina	mayíná (L)
kúdú(M)	oldness	obúkulu	múkulu	búkuluumpé	kúlú (M)
bánjá(M)	courtyard	ekibanza	cíbanja	banza(M)	
kóbá(M)	skin	éngoba	cíkoba	díkoba	
púngú(M)	eagle	ekíhungu			púngú (M)
kúmú	witchdoctor	omúkumú		fumu(M)	
kédé(M)	frog	ekíkere	cíkere		
jábú	beer	óbwabú	mafu		
júká	breath	ómuka	muka		
jámi (M)	chief	ómwami			ámǐ (B)

c̣imbá(M)	lion,wildcat	eỵṣimba		Jimba(M)	
páda	baldness	olúhala	lúalá	díbalá	
pácà	twin	omúhasa		dípasá	lipása (L)

We conclude that Meeussen's reconstructions are correct and that the source of the Kinande /H0/ vs. /HL/ contrast is PB HL vs. HH.

3.5. Monosyllables. Our corpus contains 24 stems that can be traced back to monosyllables in the Guthrie PB reconstruction: 17 reconstruct as H and 9 as L. The PB H stems appear in Kinande with the H on the preceding prefix, reflecting the retraction also seen in the disyllabic /LH/ stems. Most also allow the attachment of the H% boundary tone. Nine stems can be traced back to PB L. All except *dì* 'long, tall' have /0/ reflexes in Kinande that allow attachment of the H% boundary tone.⁵ We include CVV stems where the first vocoid is realized as a glide and the resultant CGV syllable counts as a single tone-bearing unit. The umlaut indicates Runyakore and Haya stems whose H alternates with phrase-medial forms where it appears on the stem in its etymological position.

(17) PB monosyllable reflexes

PB	gloss	Kinande	Luba	Runyakore	Haya	Jita
cú	face	obúsö		obüso	obüso	oBusû
tú	ear	okútü	dícu	okütu	okütwi	okutwî
dó	night	ekíró	dílolo	ekíro	ekíro	
tá	bow	obútä		obuta	akäta	
ḅj̣	excrement	amáḅj̣	túufi	amäzi	amäzi	
ḳj̣	corpse	omúḳj̣		omüfu	omüfu	omufû
ké	smallness	obúkë	búkëse			
já	outside	eỵj̣hyä				a:njâ
ḍj̣j̣	knee	eṛj̣rẉj̣		oküju	oküjwi	
ḍj̣o	food	akályö		ekyókürya	ekya:külya	eBilyô
c̣j̣é	fish	ekítswë				i:nswî

⁵ Aside from *ekindu* 'thing' monosyllabic stems do not permit the H% boundary tone to associate to the prefix. Working within the framework of Lexical Phonology where word-level phonology precedes phrase-level phonology, Mutaka (1994) postulates an underlying long vowel for the root so that the H% associates to the phonological penult. The more plausible alternative is to allow the phrase-level phonology access to the word-internal structure. See Odden (1996) for other examples in which phrasal phonological processes such as the shortening of a pre-complement long vowel in Kimatuumbi is sensitive to the prefix-stem parse.

bí	badness	obúbì	búbì	obübi	obübi	oBuBiBî
bŭ	ash	eríbŭ	bútu			lifû
tí	tree	omúti	múci	omuti	omúti	litî
dó	sleepiness	otúlo		otüro	otülo	i:ntirô
dá	louse	énda				i:ndâ
cé	father	íse				
cúá	termite	omúswa	nswa	omüşwa	omüşwa	omuswâ
mè	dew	ekimè	dímé	orume	olume	ecime
dà	intestine	olulä		orura	amala	oBula
tù	cloud	ekítù		ekicu		
ntù	thing, person	ekĩndu	múúntú	ekiintu	ecinu	
jì	village	omŷyi			omüji	ecijíji
bùè	stone	eribwè				liBui
gà	crack	ekigä				
pŷ	pit of stomach	ekíhŷ	cífu			
dì	long, tall	omúli	múlé			

The following table summarizes the regular developments of the PB tonal classes in Kinande. Five of the six subtypes for disyllabic stems in the Hyman typology of (1) have been traced. The /0L/ class represented by *e-ki-tsungu* ‘potato’ remains to be accounted for. See section 5.

(18) PB canonical reflexes

<i>PB</i>	<i>example</i>	<i>Kinande</i>	<i>gloss</i>
HL	dúmè	o-mú-lüme	man
HH	kádì	o-mú-kaljì	woman
LL	mèdò	o-mu-mëro	gullet
LH	dùmbé	o-mŷ-lúmbjì	long rain
LH	pùká	e-kí-húka	insect
H	tú	o-kú-tö	ear
L	mè	e-ki-më	dew

4. Chronology

In many Eastern Bantu languages the PB H vs. L contrast was reinterpreted as H vs. 0 (Clements & Goldsmith 1984). This restructuring helps to explain the long distance displacement of H tones found in such languages as Digo (Kisseberth

1984) and Chizigula (Kenstowicz & Kisseberth 1990) as well as rhythmic alternations of H such as those found in Kirundi (Goldsmith & Sabimana 1985). With a syllable's L reanalyzed as 0, it no longer blocks the drift of H nor buffers adjacent Hs, which tend to keep a respectable distance from one another. A major motivation for the reanalysis and switch to an accentual system was the merger of the HH class with HL, which Clements & Goldsmith (1984:7) dub "Meeussen's Rule"; cf. Philippon (1998). The result was an inventory of tonal contours with just one H peak, which could be reanalyzed as a "head" governing a domain of toneless syllables. The verb had the potential for an accentual interpretation already in PB since the H vs. L lexical contrast was restricted to the initial syllable.

We may account for the difference between Kinande vs. the Lacustrine languages Runyankore, Haya, and Jita by assuming different chronologies in the HH>HL and L>0 changes, as shown in (19). In the Lacustrine languages HH>HL occurred before the reanalysis of L as 0 so that any trace of a distinction between the PB HH vs. HL stem classes was eliminated. In Kinande, on the other hand, L>0 occurred first with the subsequent HH>HL (perhaps via an intermediate downstepped H¹H) producing the three-way H vs. L vs. 0 contrast on the final syllable that is the basis of the *o-mú-lùme* vs. *o-mú-kalì* puzzle we have been trying to explain and that prompted Hyman & Valinande (1985) to posit a global rule for a comparable contrast in the verbal inflection.

(19) reconstruction of tonal classes

Lacustrine Bantu

PB	HL	HH	LH	LL
HH>HL	—	HL	—	—
L>0	H0	H0	0H	00
surface	H0	H0	0H	00

Kinande

PB	HL	HH	LH	LL
L>0	H0	—	0H	00
HH>HL	—	HL	—	—
surface	H0	HL	0H	00

The Kinande split of the PB LH class into LH vs. HH on the basis of either the voicing of the medial consonant or the postulated vowel length (recall (9) vs. (10)) allows us to pinpoint the H retraction of PB LH as later in the chronology. The development of the double H must have occurred after HH > HL. Otherwise

PB *pùká* ‘insect’ would have joined HH *kádî* and should appear as Kinande *e-kí-huka* instead of the attested *e-kí-húka*. On the other hand, it must have preceded H-retraction to account for the fact that both H’s are shifted one syllable/mora leftward in *e-kí-húka* as well as to ensure that the medial consonant that conditions the split still separates the two stem syllables. As a result of the split of the PB LH class, Kinande had five tonal categories for disyllabic stems (H0, HL, 0H, HH, 00) in contrast to just three for Lacustrine Bantu (H0, 0H, 00).

Subsequently, Kinande as well as Runyankore and Haya (but not Jita) retract H from the final syllable. Poletto (1998) treats the phenomenon in Runyankore as crowding by a L boundary tone. For Haya Hyman & Byarushengo (1984) derive the retracted prepausal form *obugólo* ‘snuff’ (cf. *obugoló bwange* ‘my snuff’) via an intermediate form *obugóló* in which the final H has spread to the preceding syllable. This spread H tone appears in certain phrasal contexts such as before a vocative noun: *obugóló káto* ‘(the) snuff, Kato’. In Runyankore and Haya the retraction occurs at the end of a phrase and leads to regular alternation between a phrase-final retracted form and a phrase-medial form with accent on the final syllable (20). In Runyankore retraction produces surface merger with the original H0 (<HL) class if the penult is short. If the penult is long the contrast is realized as Fall vs. H. Haya maintains the contrast as Fall vs. H for both long and short syllables.

(20)	<i>pause</i>	<i>my N</i>	<i>gloss</i>
H0	e-ki-sígye	e-ki-sígye kyangye	eyelid
	e-ki-rô:to	e-ki-ró:to kyangye	dream
0H	e-ki-túgu	e-ki-tugú kyangye	liver
	e-ki-kó:ko	e-ki-ko:kó kyangye	animal

Runyankore (Kaji 2004)

H0	e-ki-fûba	e-ki-fúba kyange	chest
	e-ki-kô:na	e-ki-kó:na kyange	crow
0H	e-ki-géle	e-ki-gelé kyange	sole of foot
	o-mw-ó:ya	o-mw-o:yá gwange	body hair

Haya (Kaji 2000)

In Kinande the retraction of the PB word-final H differs from Lacustrine Bantu in a number of respects, suggesting that it was probably a separate development. First, the language eliminated the PB vowel length contrast (while retaining the [ATR] contrast for high vowels). Thus, a surface contrast in short vs.

long syllables was not available to express the distinction between original and retracted H's. There are other differences as well. First, retraction in Kinande does not result in phrasal alternations: a PB LH stem like *pàndé* 'piece of cloth' from (9) appears as *e-ki-hánde* with a stable H. In contrast PB *pùká* 'insect' alternates in Runyankore (*ekihúka*, *ekihuká kyange* 'my insect') and Haya (*ekiúka*, *ekiuká kyange*). Second, in Kinande all stem H tones retracted—not just those on the final syllable—presumably to allow more comfortable phonetic expression of the larger range of tonal classes. The noun class prefixes were all toneless in PB and offered a tempting Lebensraum for the more crowded stem inventory. As shown below, the H retraction allowed a system of surface tonal contrasts to emerge in which there is just a binary opposition for any of the three positions (final, penult, antepenult) in exchange for the earlier (underlying) three-way contrast on final syllables.

(21)	early	0-HL	0-H0	0-0H	0-HH	0-00
	H-retraction	H-0L	H-00	0-HL	H-HL	_____
	surface tonal oppositions					
	antepenult:	H vs. 0				
	penult:	H vs. 0				
	final:	L vs. 0				

Another point worth making concerns the limited distribution of the L in the reconstruction of (21). It is restricted to occur in the context H__#. This phonotactic restriction helps to explain another puzzling asymmetry in Kinande tonal development. In the wake of retraction of the final H, the Kinande system of contrasts allowed two alternative interpretations of the final syllable's nonhigh pitch: /L/ or /0/. There is an interesting difference between the monosyllables and disyllables here. For the LH disyllables with PB cognates, 14/15 chose /HL/, which blocks the H%, as in *e-ki-hánde*. But monosyllables such as *o-kú-tü* < PB *tú* 'ear' chose /H0/ at a 13/17 rate. This difference between the monosyllables and disyllables presumably reflects the fact that /HL/ originated from PB HH structures in the disyllabic stems. Under a minimal generalization learner (Albright & Hayes 2002) such factors as the location of the morpheme junctures could be taken into account in the transmission and reconstruction of the grammar from one generation to the next so that the phonotactic constraint that restricts L to the H__# context could include the tautomorphemic factor as well. If this tautomorphemic property is factored into the phonotactic restriction then a /L/ analysis for the retraction site in monosyllables such as *o-kú-tü* would be precluded since the

H shifted to the prefix and is hence no longer in the stem. However, it should be noted that we still lack an explanation for the uniform /L/ choice for the disyllables since in principle both /HL/ < HH and /H0/ < HL analyses were available. The former preserves an association line, albeit one that is linked to a different tone. If faithfulness to association lines governs input-output relations then this might be a reason to prefer /HL/ over /H0/. The Optimal Domains Model of autosegmental phonology (Cassimjee & Kisseberth 1998) in which a feature specification is accompanied by a domain or span indicating its scope offers another possible interpretation in which two domains are combined into a single one so that (H)(H) > (H 0) is distinct from (H) 0.

Upon the completion of H retraction and in the absence of any alternations between the penult and final syllable for the *e-ki-hánde* class, we assume that the inventory of tonal classes was restructured, as indicated in (22). The Kinande disyllabic tonal classes deployed a surface L vs. 0 contrast in final position and a ternary H vs. floating H vs. 0 contrast initially.

(22)	<i>PB</i>	<i>HL</i>	<i>HH</i>	<i>LH</i>	<i>LL</i>	
	Kinande	/ ^H 00/	/ ^H 0L/	/HL/	/ ^H HL/	/00/
	example	mú-lúme	mú-kalĩ	mụ-lǔmbĩ	mụ-sĩsa	mu-mëro
	‘man’	‘woman’	‘rain’	‘vein’	‘gullet’	

The phonotactic constraint restricting L to the H__# context is a relatively complex one since it is composed of three terms and crucially refers to both a left-hand and right-hand context (cf. the model of constraint induction in Hayes & Wilson (2008) where constraints are preferentially restricted to two terms). Furthermore, a stem’s specification as /L/ or /0/ could not be predicted on the basis of phrase-medial contexts such as preadjectival (recall 1). As we will now see, both of these factors played a role in the evolution of the system to its current state.

5. Extensions.

The discussion to this point has been restricted to the portion of the Kinande lexicon for which PB cognates are available. This of course is a small fraction of the current lexicon—one that managed to survive many cycles of transmission from one generation of Kinande speakers to the next. What is the inventory and population of the tonal classes in the current language? Here we are indebted to Jones (2007) who classified the nouns (and verbs) in the Kavutirwaki (1978) lexicon with respect to their tonal patterns. In (23) we have reorganized his tabulation of

A chi-square 2x2 contingency table for the voicing factors T+R vs. D+ND over the *o-mú-lüme* vs. *o-mú-kali* classes is statistically significant: chi-sq = 13.6, df = 1, p = 0.000.

The second observation with respect to (23) is that the /L/ vs. /0/ contrast has spread to each of the other classes so that now every tonal category is cross-classified with respect to the dual phonological interpretation of the final syllable—a type of feature economy (Clements 2003). But in each case, the class that represents the original development in our reconstruction outnumbers the innovating class to which the 0/L contrast has been extended. As a result, the PB LL>00 now has a /0L/ counterpart—the presumed origin of the *e-ki-tsungu* class from (1). This development indicates that the postulated phonotactic restricting L to the H__# context in the reconstruction of (22) has been simplified by dropping the initial term. Moreover, the PB LH class which originally had almost exclusively the final /L/ that blocks the H% boundary tone has now gained /0/ counterparts too. This is true for both the double H from voiceless medial consonants like *o-mú-kékä* as well as the single H from voiced medials like *e-ki-dóngö*.

The third observation is that the voicing category of the medial consonant that originally defined membership in the double-high *e-kí-sáka* vs. single-high *e-ki-hánde* reflexes of the PB LH class continues to play a role in the extension of the class. In (25) we tabulate the distribution of voicing categories for the medial consonant. The data indicate a strong bias for the *e-kí-sáka* class with double H to contain a medial voiceless consonant or voiced sonorant while the *e-ki-hánde* class contains a disproportionate number of ND. This difference is statistically significant: chi-square = 57.5, df=1, p=0.0001.

(25)	<i>T</i>	<i>R</i>	<i>D</i>	<i>ND</i>	
<i>e-kí-sáka</i>	26	34	2	1	T=voiceless
<i>e-ki-hánde</i>	11	4	1	34	R=sonorant
					D=voiced obstruent
					ND=prenasal voiced

This finding suggests that the voicing or compensatory lengthening contributed by the medial consonant that originally defined membership in the two classes continues to play a role.

A similar finding holds for the split of the PB LL class to /00/ *e-ki-ryätu* ‘shoe’ vs. /0L/ *e-ki-tsungu* ‘potato’ (26). While the /0L/ class is much smaller, the low-tone favoring ND forms its largest subclass. A contingency table over the

same T+N vs. D+ND yields a less robust but still significant difference: chi sq = 4.09, df=1, p=0.043.

(26)		<i>T</i>	<i>R</i>	<i>D</i>	<i>ND</i>	
	e-ki-ryātu	56	139	23	79	T=voiceless
	e-ki-tungu	22	12	7	24	R=sonorant
						D=voiced
						ND=prenasal voiced

Finally, the /L/ vs. /0/ contrast has also been extended to the monosyllables (27), dropping the tautomorphic restriction in the postulated original state of (22). Once again both terms of the contrast have been extended so that the PB H class now has a final /L/ counterpart to the original /0/ and the PB L class now has a /L/ counterpart to the original /0/. As with the disyllables, the extensions are smaller than the original classes.

(27)	<i>PB</i>	<i>example</i>	<i>gloss</i>	<i>size</i>	<i>representation</i>
	H	e-r̄ ₃ -b̄ ₃	ash	32	/ ^H 0/
		o-bú-swa	white mushroom	9	/ ^H L/
	L	e-r̄ ₃ -bwë	stone	24	/0/
		o-bu-do	mushroom	2	/L/

6. Summary and Conclusions.

This paper has traced the Proto-Bantu origin and the development of the six contrasting Kinande tonal classes of disyllabic nominal stems in (1) on the basis of two cognate sets. First, comparison with several closely related Lacustrine languages shows that the six classes originate from a HL, LH, LL contrast. Second, a deeper comparison with several Congolese languages suggests that the puzzling split of the HL class with respect to the presence or absence of a H% boundary tone can actually be traced to a HH vs. HL contrast in Proto-Bantu, confirming a hypothesis in Meeussen (1976). We proposed a chronology of tonal changes leading to a reconstructed state with a ternary H vs. L vs. 0 contrast on the final syllable and a phonotactic constraint restricting the L tone to the context H__#. The current Kinande lexicon has extended the ternary contrast by dropping the H restriction. Various lexical items have changed their tonal class affiliation based on alternative analyses of ambiguous phrase medial or phrase-final forms.

The research reported here depends entirely on the availability of large and accurate lexicons such as Yukawa (1992), Kaji (1986, 1992, 2000, 2004), and Kagaya (2005). The construction of such lexical materials for a greater variety of languages is an urgent task for Bantu linguistics and will help to put the reconstructions by such pioneers as Greenberg, Guthrie, and Meeussen on a more solid footing.

Appendices

The first column is the assumed PB tonal reconstruction. The second grades the Kinande correspondence: a marks an expected reflex; b denotes an anomalous tonal or segmental correspondence. The next column shows the number of the Guthrie reconstruction followed by the actual form and then the reconstruction from Meeussen (1980). The Kinande forms are primarily from our consultant but were also checked with the Kavutirwaki (1978) and Mutaka & Kavutirwaki (2006) lexicons. The Runyankore forms are taken from Kaji's (2004) lexicon and the Haya ones from Kaji (2000). Jita-U is from Downing's (1996) glossary based on the Ukerewe dialect and Jita-M is from Kagaya (2005) based on the Mrangi dialect. In appendix B, the Tembo data are taken from Kaji (1986, 1996) and the Luba data are from Yukawa (1992). For the Lingala column the forms labeled with M are Lomongo forms from Meeussen (1976) while the remaining data are Lingala words from Kaji (1992).

<i>R</i>	<i>T</i>	<i>G no.</i>	<i>PB-G</i>	<i>PB-M</i>	<i>gloss</i>	<i>Kinande</i>	<i>Runyakore</i>	<i>Haya</i>	<i>Jita-U</i>	<i>Jita-M</i>
HL	a	71	béédè	béede	breast	eribère	i:bê:re	eibê:le	liBé:re	ribeère
HL	a	148	bj̀nà	bj̀n-	dance	amábj̀na			i:mbína	ribína
HL	a	174	búa	búa	dog	émbwä	émbwa	émbwa	imbwâ	imbwa
HL	a	192	búgà		garden	ekíbúga	embúga	ekibúga		
HL	a	200	búmbà		clay	eríbumba	i:bú:mba	eibúmba	liBú:mba	
HL	b	290	kékà	kéka	mat	omukékä	omukye:ka	omuke:ka	omuke:ka	omukeeka
HL	a	296	cápò	cápo	bag	eyjsáho	esháho		ecikápo	echikápo
HL	a	311	cégé	ceke	sand	omúsège	omushê:nyi		omuséñi	omusényi
HL	a	324	kúmù	kumu(a)	thumb	ekíkúmo	orukúmu	olukúmu		echikúmu
HL	a	347	çj̀y	tj̀u	face	obúsj̀y			oBusû	
HL	a	388	pini	pinj	hoe handle	omúhini	omuhini	omuîni		
HL	a	436	cúkà		hoe	eyjsúka	efúka	enfúka	i:nsúka	isúka
HL	a	512	yídò	(j)údu	nose	énindo	enyi:ndo	eñîndo		
HL	a	572	dími	dimj	tongue	olulími	orurími	olufimi	olufimi	orurími
HL	a	697	dúmè	dúme	man	omúlúme			omulúme	omurúme
HL	a	729	dúj	dú(i)	knee	erirwj	okúju	okújwi		
HL	b	746	cúpà	cúpa	bottle	etsúpä	ecúpa	echúpa	i:ncúpa	
HL	a	914	gútà		oil	amágúta	amajúta	amajúta	lifú:ta	amafúta
HL	a	952	jókà		worm	énzòka	enjòka	ekijòka	i:njòka	injòka
HL	b	955	júbà	júba	sun	eryúba	i:zô:ba	eizô:ba	lisú:Ba	risuúba
HL	a	980	kàdà	káda	charcoal	erikála	i:kára	eikâra	likára	rikára
HL	a	1016	kátà	káta	headpad	éngàta	engáta	engâta	i:ngáta	ingáta
HL	a	1053	kídà	kída	tail	omúkira	omúkira	omukîra	omukíra	omukíra
HL	b	1079	kj̀gé	kj̀ge	eyebrow	ekikj̀ge			ecisige	
HL	a	1120	kódù	kodj	scar	éngolj			likófu	ing'ófu
HL	b	1208	kúmì	kumj	ten	erikùmj	i:kúmi		ekúmi	
HL	b	1125	kókò	koko	crust	olukòko			oBukóko	obukóko
HL	b	1156	kóópì		slap	erikófj			likó:fi	
HL	a	1181	kúj	kunj	firewood	olúkwe	orúku	olúkwi	olukwî	orukwi

<i>R</i>	<i>T</i>	<i>G no.</i>	<i>PB-G</i>	<i>PB-M</i>	<i>gloss</i>	<i>Kinande</i>	<i>Runyakore</i>	<i>Haya</i>	<i>Jita-U</i>	<i>Jita-M</i>
HL	a	1258	kùbà	kùba	chest	ekùkùba	ekifùba	ekifùba	ecifùBa	echifùba
HL	b	1260	kùdù	kùdu	tortoise	ekùlù			liñawakùru	bawakùru
HL	a	1273	kùpà	kùpa	bone	erùkùha	i:gùfa	eigùfa	ligufwa	riwa
HL	a	1350	nènè	nene	bigness	obúnène			oBunéne	obunéne
HL	a	1547	pìdà	pìda	pus	erùhira			amai:ra	obufira
HL	a	1548	pìgà		hearth	erùhìga	i:héga	eìga		
HL	a	1551	pìmbò		stick	omùhùmbo			insí:mbo	isímbo
HL	a	1576	únà		base of tree	éndjina				amasína
HL	a	1650	tàkò	táko	buttock	erùtáko	i:táko	eitáko		ritáko
HL	a	1652	támà	táma	cheek	erítèma	i:táma	eitáma	litáma	ritáma
HL	a	1666	tándà	canja	bed for wood	ekítanda	ekitâ:nda	ekitânda	ecitâ:nda	echtânda
HL	a	1692	tébè		stool	ekìbete				echitébe
HL	a	1699	tégò		trap	ekítego			omutégo	omutégo
HL	b	1723	tétè		reed	ekitetè	omutè:te			omwitète
HL	a	1738	úimà	úima	heart	omútima	omufíma	omufíma		omufíma
HL	a	1808	túè	túe	head	omútwe	omútwe	omútwe	omutwê	omutwe
HL	a	1863	túkù	túku	day	obùtùkù			olusíku	orusíku
HL	a	1867	tùmò	tùmo	spear	erùtùmo				richúmu
HL	a	1894	yádá	jáda	finger nail	ékyála	ekyâ:ra	ekyâ:la	olujára	injára
HL	a	1904	yákà	(j)áka	year	ómwáka	omwâ:ka	omwâka	omwâ:ka	omwâka
HL	a	1922	yánà	jána	child	ómwána			omwâ:na	omwána
HL	a	1966	yédù		white	óbwèru			éra	
HL	a	2010	yímbò		song	ólwimbo			olwí:mbo	orwímbo
HL	a	2025	yìbì	ìjb-ìj	thief	ómwìbj			omwí:fì	omwífì
HL	a	2030	yìcò	ìjco	eye	érjso	erì:sho	elì:sho	elì:so	eríso
HL	a	2054	yìkì	ìjúki	smoke	ómùki	omwí:ka	omwí:ka		
HL	a	2068	yìná	ìjina	name	érjina			lisí:na	risína
HL	b	2073	yìnò	ìjino	tooth	erino	erì:no	elì:no	elì:no	eríno
HL	a	2080	yìnyù	upu	salt	ómünya	omwô:nyo	omwô:ñu	omú:ñu	omuýnyu

<i>R</i>	<i>T</i>	<i>G no.</i>	<i>PB-G</i>	<i>PB-M</i>	<i>gloss</i>	<i>Kinande</i>	<i>Runyakore</i>	<i>Haya</i>	<i>Jita-U</i>	<i>Jita-M</i>
HL	a	2113	yókì	júki	bee	énzüki	enjóki	enjôki	i:njóki	
HL	a	2137	yòtà	jó(n)ta	thirst	ényöta			lili:yo	
HL	a	2162	yúmà	(j)úma	iron	ékyüma	ekyô:ma	ekyô:ma		echuúma
HL	b	ps153	dàngò	diango	door	omulángo	omuryâ:ngo			omuryango
HL	a	ps40	búda	búda	rain	émbüla	enjúra	enjûla		
HL	a	ps133	cúé	cúi	fish	ekítswë			i:nswî	iswi
HL	a	ps9	bépò	pépo	cold	émbëho			i:mbé:o	
HL	a	ps336	kùmù		medicine man	omúkumu	omufúmu	omufúmu		omufúmu
HL	a	141	bjdo	bjdo	soot	émbjro				
HL	a	166	bónò	bono	castor beans	olúböno				
HL	a	211	bútò	búto	seed	émbüto				
HL	a	222	bũi	bui	white hair	émbwji				
HL	a	619	đimù	đimu	spirit	ekírjmu				
HL	a	1078	kjdu	tjdu	stupidity	ekíkiru				
HL	a	1407	pàcà	pàca	twin	omúhasa				
HL	b	1408	pàcà		axe	émbása				imbasa
HL	a	1549	pjgò		kidney	émbjko				ifigo
HL	a	1615	púdo	púdo	foam	erjhuilo				
HL	b	1643	tàdè	tádi	iron ore	erjtále				
HL	a	1765	títù	títú	forest	omuşjtu				
HL	a	2056	yjkò		fireplace	érjiko				
HL	b	ps221	gímà	kíma	monkey	éngíma				
HL	b	ps553	yúcì	ljji	river	ólúsj				
						ólúsi				

<i>R</i>	<i>T</i>	<i>G no.</i>	<i>PB-G</i>	<i>PB-M</i>	<i>gloss</i>	<i>Kinande</i>	<i>Runyakore</i>	<i>Haya</i>	<i>Jita-U</i>	<i>Jita-M</i>
HH	a	55	bánjà	bánjá	yard	ekibanza	ekibâ:nja			
HH	a	392	cúa	cúa	termite	omúswa	omúshwa	omúshwa	omuswâ	
HH	a	399	púa		thorn	eríhwa	í:hwa	amá-wa	liwâ	riwa
HH	b	479	dámú	damu	sister-in-law	omúlámu				omurámu
HH	a	555	díó	díó	right hand	omáli			okulyô	okuryo
HH	a	986	káđi	káđi	woman	omúkalj			omugási	omugási
HH	a	1032	kédè	kédé	frog	ekikere			likére	
HH	a	1095	kóbà	kóbá	hide	ekíkoba	ekikóba	ekikôba		orukóba
HH	a	1126	kókò	kókó	chicken	éngoko	enkóko	enkôko	i:nkóko	ing'óko
HH	a	1274	kúpi	kúpi	shortness	ekjkuhji			fú:i	obufúi
HH	a	1412	pádá		baldness	olúhala	oruhára	oluâra		echipara
HH	a	1476	pémbè	pémbé	horn	erjhembe	i:hê:mbe	eiyêmbé	liyé:mbe	oruyêmbé
HH	a	1603	púngù	púngú	eagle	ekihungu	empû:ngu	ekiûngu		ipúngu
HH	a	1640	tádà	tádá	granary	ekítara	ekitára		ecitára	echitára
HH	a	1761	túndj	túndj	heel	akásinziro	ekisinsi:no			risisinyo
HH	a	1982	yénjé		cockroach	ényenze	ekiyê:nje	eñênje	liyé:nje	riyênje
HH	a	2091	yjpuá	jpuá	niece, nephew	ómuhwa				omwíwa
HH	a	2180	yúdí	júdí	hair	olúywiri			i:mfwí:ri	orufwíri
HH	a	340	cíndi		squirrel	ekísindi				
HH	a	1481	péné	péné	goat	émbene				
HH	a	1562	pjtu	pjtu	hyena	émbjtu				
HH	a	1882	túútú		bump	ekisusú				
HH	a	ps2	cánjú		branch	ekísanza				

<i>R</i>	<i>T</i>	<i>G no.</i>	<i>PB-G</i>	<i>PB-M</i>	<i>gloss</i>	<i>Kinande</i>	<i>Runyakore</i>	<i>Haya</i>	<i>Jita-U</i>	<i>Jita-M</i>
LH	b	157	bògó	bogó	buffalo	embögo embógo ébógo	embogo	embógo	i:mbogô	imbogo
LH	a	260	càká		bush	ekísáka	ekishaka	ekisháka	lisakâ	risaka
LH	a	349	çìcá		vein	omúśísa	omúsi	omúsi		omusiya
LH	b	361	nònj	(j)unj	bird	enyönyu	ekinyonyi	ekiñoñi	i:ñoñi	inyonyi
LH	a	667	dòngó	dongó	mud for building	obudóngo	obudô:ngo	obudongo		
LH	a	744	dũmbí		long rain	omulũmbj	omuju:mbi			
LH	b	839	gòđj		bride	omúgóle	omugóre	omugóle		
LH	a	865	gùádí	kuadé	partridge	engwáli			i:nkwa:rê	ing'wäre
LH	b	992	kàáká	kaka	grand-parent	múkaká			káka	bakaáka
LH	a	1017	káté		bread	omukáti	omuga:ti	omukâ:te	omuká:te	omukaáte
LH	b	1415	pàđj		ant	embälj			i:mpaji	
LH	a	1450	pápá	papá	wing	ekjúpápa	iipapa	eipápa	liBaBâ	orubaba
LH	a	1596	pùká	puka	insect	ekihúka	ekihúka	ekiúka		
LH	b	1749	ťkí		stump	ekísjki	ekisi:nsi	ekisibu	ecisikî	
LH	a	1749	ťkí		stump	ekísjki	ekisi:ku			
LH	a	1948	nyátj		grass	obúnyátsi	orunyâ:nsi	akañâ:si	liñási	rinyaási
LH	b	1977	yèndá	kenda	nine	omwènda	omwenda			
LH	a	2013	yíná	jjiná	hole in ground	ekyúna	eki:na	ekí:na		
LH	a	2133	yòngó	jongó	brain	obóngo	obwongko	obwôngo	omwo:ngô	obwongo
LH	b	2140	yòyá	jojá	body hair	olwéya	orwo:ya	omwó:ya		
LH	a	2167	yùmbá		room	ekyúmba			ecú:mba	
LH	a	2168	yùmbá	(j)umbá	house	enyúbä		énju	i:ñú:mba	inyumba
LH	a	2173a	nyùngú		pot	enyúngu	enyu:ngu	eñungu	i:ñu:ngû	inyungu
LH	b	788	gàngá		root	erjhánga				
LH	a	1436	pàndé		piece	ekihánde				echipande

<i>R</i>	<i>T</i>	<i>G no.</i>	<i>PB-G</i>	<i>PB-M</i>	<i>gloss</i>	<i>Kinande</i>	<i>Runyakore</i>	<i>Haya</i>	<i>Jita-U</i>	<i>Jita-M</i>
LL	a	35	bòkà	boga	vegetable	embòka	emboga		i:mboga	
LL	a	44	bàmbò		peg for hide	olumambo	orubambo	emambo	oluma:mbo	
LL	a	65	bèbà	beba	rat	embèba	embeba	embeba	i:mbeBa	imbeba
LL	a	112	bìdì	bidì	body	omubiri	omubiri	omubili		omubiri
LL	a	176	bùè		stone	erj̄bwè			liBui	ribuyi
LL	b	289	càngà		island	ekisanga			lisí:ngâ	rišinga
LL	a	351	nàmà	(n)ama	muscle, meat	enyàma	enyama	eñama	i:ñama	inyama
LL	a	460	dàdò	dado	bridge	ekilàlo			oluda:ra	
LL	a	470	dàgò	dago	mat	ekirago				echirago
LL	b	519	dèdù	dedù	beard	olulèrù			ecirefu	echirefu
LL	b	544	dèngè	denge	leg	omulenge				echirenge
LL	a	565	didò	dido	fire	omuliro	omuriro	omulilo	omuliro	omuriro
LL	a	567	didò		mourning	ekirīro				
LL	a	631	dj̄tò	dj̄to	heaviness	obulj̄to			sito	obusito
LL	a	664	dòngò	dongo	line of objects	omulöndo				amaroongo
LL	a	756	gàbò	gabo	shield	engäbo		ekigabo	i:ngaBo	inguba
LL	a	774	gànà	gana	hundred	erj̄gäna			eligana	egana
LL	a	776	gànò	gan-o	tale	olugäno				
LL	a	784	gànjà	ganja	palm of hand	ekigänza	ekiga:nja	ekiganja	ecigá:nja	echiganja
LL	b	786	gàngà	ganga	medicine man	omúganga		omugánga		
LL	a	802	gègò	gego	molar	ekiyigo	ekigigo	ekigino	amagigo	rigigo
LL	b	803	gèmbè	gembe	hoe	ekigémbe				
LL	a	805	gènj̄		stranger	omugènj̄				omugenyi
LL	b	827	gìgè	gige	locust	engike	enzigye	enzigye	i:njige	isige
LL	a	842	gòdò	godoci	evening	erj̄gölo				keegoro
LL	a	844	gòmà	goma	drum	engöma			i:ngoma	ing'oma
LL	b	854	gònò	gono	fish-trap	engäna			omugono	omugono
LL	b	858	gòngò	gongo	back	omugóngo	omugô:ngo	omugongo	omugo:ngo	omugongo
LL	a	866	gùè	goj	leopard	engwè				ingo

<i>R</i>	<i>T</i>	<i>G no.</i>	<i>PB-G</i>	<i>PB-M</i>	<i>gloss</i>	<i>Kinande</i>	<i>Runyakore</i>	<i>Haya</i>	<i>Jita-U</i>	<i>Jita-M</i>
LL	a	884	gùdù	gudu	leg	okugùlu	okuguru	okuguru	okuguu	okuguru
LL	a	888	gùdùbè	gudube	pig	engulùbe			i:ngurúBe	ingurúbe
LL	a	894	gùmbà		barren	omugùmba			omugu:-	omugu-
LL	b	894	gùmbà		woman	omugùmbä			mba	mba
LL	a	905	gùbà	gùba	bellows	omùgùba				
LL	a	917	jàdà	jada	hunger	enzàla	enjara	enjala	i:njara	
LL	b	951	jògù	jogu	elephant	enzógu	enjojo	enjoju	i:njofu	injofu
LL	b	1103	kòcùè		rat	engotsj				
LL	a	1295	mèdò	mido	gullet	omumèro	omumIro	omumiro	limiro	echimiro
LL	a	1308	mùdà	mùda	mucus	ebimùra	ebImIra			
LL	b	1369	nòkù		flesh	omùnyökù				
LL	a	1395	nyòkò	poko	mother	nyòko				
LL	a	1415	pàdǰ	padǰ	ant	embälǰ	empazi	obwa:zi	i:mpaji	
LL	a	1649	tàkà		soil	ekitàka	i:taka	eitaka	litaka	
LL	b	1900	yàdò		land	ekihàro				
LL	a	1920	yàmbò	gambo	bait	ekyàmbo			eca:mbo	obwambo
LL	b	1938	yàngù		quickness	obwàngu				
LL	b	2039	yǰǰì	ǰǰgi	door	olüyi	orwi:gi	olw:igi	olwi:gi	orwigi
LL	b	2126	nyòndò	(j)undo	hammer	enyóndo	enyo:ndo	eñondo	i:no:ndo	inundo
LL	a	1379	nùà		lip	omunywä	omunwa	omunwa		omunwa

Appendix B

	R	T	G no	PB-G	PB-M	gloss	Kinande	Tembo	Luba	Lingala
	H	a	97	bí	bú	badness	obúbí	búbí	búbí	
	H	b	135	bǐ	bǐj	excrement	amábǐ	mási	túufí	
	H	b	216	bǔ	(g)ibǔ	ash	erǐbǔ	lufúfú	bútu	
	H	a	392	cúá	cúá	termite	omúswa	míhwáhwa	nswa	
	H	b	402	cúcú		chick	omusú		cikúkú	sósó
	H	a	634	dó	dóo	night	ekiró	lúólóolo	dílolo	butú
	H	b	1023	ké		smallness	obúkě	múke	búkése	
	H	a	1729	ú	ú	tree	omúti	múci	múci	
	H	a	1801	tú	túi	ear	okútü	kútsú	dícu	litói
	H	a	1808	túè	túe	head	omútwe	étswe	mútu	motó
10										
	L	a	176	bùè	bue	stone	erǐbwè		dǐbwé	
	L	a	1290	mè	me	dew	ekimè		dímé	
	L	b	1610	pǔ		pit of stomach	ekǐhǔ	cúfú	cífu	
	L	a	1798	ntù	ntu	person	omündu	múndzú	múúntú	moto
	L	b	ps166	đi		long, tall	omúli	búre	múlé	
5										
	HL	a	71	béédè	béede	breast	erǐbère	éberé	díbeelé	libéle
	HL	a	174	búà	búa	dog	émbwä	mǐbwá	mbwá	mbwá
	HL	a	311	cégé	ceke	sand	omúsège	músheé	lúsééngá	
	HL	b	436	cǔkà		hoe	eyǐsǔka	fuká	nkasú	
	HL	a	479	dámú	damu	sister-in-law	omúlämu	múlamú		
	HL	a	512	yídò	(j)údu	nose	énindo		dyúulú	zólo
	HL	a	572	dímì	dímj	tongue	olúlimi	lúlimí	lúdimí	lolémo
	HL	a	697	dúmè	dúme	man	omúlúme	múlumé	múlumé	
	HL	b	865	gùàđi	kuadé	partridge	engwáli		nkwaadi	
	HL	b	914	gǔtà		oil	amágǔta	máfutá	máfutá	máfutá
	HL	a	952	iókà	ióka	snake	énzòka	ńzoká	nyoká	nyóka

<i>R</i>	<i>T</i>	<i>G no</i>	<i>PB-G</i>	<i>PB-M</i>	<i>gloss</i>	<i>Kinande</i>	<i>Tembo</i>	<i>Luba</i>	<i>Lingala</i>
HL	b	955	júbà	júba	sun	eryúba	ésubá	điibá	
HL	a	980	kádà	káda	charcoal	erǰkála	ékalá	đikalá	
HL	a	1053	kídà	kída	tail	omúkira	múkirá	múkila	mokíla
HL	a	1181	kûj	kúnj	firewood	olúkwë		lúkunyí	
HL	b	1260	kúđù	kúđy	tortoise	ekúlŷ	ngúru	nkuđú	
HL	a	1273	kúpà	kúpa	bone	erǰkúha		máfufwá	mokúwa
HL	a	1350	nénè	néne	bigness	obúnëne	búnené	mú-nené	monéne
HL	b	1407	pácà	páca	twin	omúhasa		đipasá	lipása
HL	b	1412	pádá		baldness	olúhala	lúalá	đibalá	
HL	a	1615	púđò	púdo	foam	erǰhŷlo			fúlo
HL	a	1650	tákò	táko	buttock	erǰtáko	étakú	đitakú	lisókó
HL	a	1652	támà	táma	cheek	erǰtéma	étamá	đitamá	litáma
HL	a	1738	úmà	úma	heart	omútima			motéma
HL	a	1765	útù	ítú	forest	omŷǰtŷ	músitsú	đítú	
HL	a	1864	túkù	túku	day	obútŷkŷ	lúsukú	đítukú	
HL	b	1867	túmò	túmo	spear	erǰtúmo		đífuma	
HL	a	1893	yádá	jáda	finger nail	olúyála		lwáalá	
HL	a	1922	yána	jána	child	ómwána	mwaná	mwaaná	moána
HL	a	2010	yímbò		song	ólwimbo			nzembo
HL	b	2025	yǰbǰ	ǰǰb-ǰ	thief	omwǰbǰ		mwíibí	moyibi
HL	a	2030	yǰcò	ǰǰco	eye	érǰso	lihó	đísú	líso
HL	a	2068	yǰná	ǰǰna	name	érǰna	ésiná	điiná	
HL	b	2073	yǰnò	ǰǰno	tooth	erino	linó	điinú	líno
HL	a	2137	yótà	jó(n)ta	thirst	ényöta		nyootá	
HL	b	ps327	kúŷgù		hoe	ekǰkŷngŷ			kóngo
HL	a	ps40	búdà	búda	rain	émbüla	mívułá	mvułá	mbúla
HL	b	ps553	yúćǰ	ǰǰǰǰ	river	olŷsi		músulú	
HL	b					olŷǰ	lwishí		

<i>R</i>	<i>T</i>	<i>G no</i>	<i>PB-G</i>	<i>PB-M</i>	<i>gloss</i>	<i>Kinande</i>	<i>Tembo</i>	<i>Luba</i>	<i>Lingala</i>
HH	a	55	bánjà	bánjǎ	courtyard	ekíbanza	cíbanja	banza (M)	
HH	b	200	búmbà		clay	eríbumba		lúpeemba	
HH	a	340	cíndí	kindi	squirrel	ekísindi		nshiindi	
HH	a	986	kádǐ	kádǐ	woman	omúkaǐ	múkasi	múkaji	moási
HH	a	1032	kédè	kédé	frog	ekíkere	číkere		
HH	a	1095	kóbà	kóbá	skin	éngoba	číkoba	díkoba	
HH	a	1126	kókò	kókó	chicken	éngoko	ńgoko	číkúkú	kókó (M)
HH	a	1197	kúdù	kúdú	oldness	obúkulu	múkulu	búkulúúmpé	kúlú (M)
HH	a	1274	kúpí	kúpi	shortness	ekíkũhǐ		bwíipi	
HH	a	1547	pǐdà	pǐda	pus	erǐhira	másira	túfina	mayíná
HH	a	1603	púnǵù	púnǵú	eagle	ekíhungu			púnǵú (M)
HH	a	1874	túmbí		chair	ekítumbǐ	cífumbi		
HH	b	1952	yáyù	jáju	yawn	émayaya		mwáau	
HH	a	ps336	kúmú		witchdoctor	omúkumu		fumu (M)	
HH	b				belt	omukábà	číkábá	múkaba	
HH	a				beer	óbwabụ	mafu		
		17							
LH	a	349	cǐcá		vein	omúsǐsa			mosisá
LH	b	1450	pápá	baba	wing	ekǐpǐpa		dǐpwáapwá	lipapú
LH	a	1450	pápá	papu	lungs	ekíhaha	ciáa		
LH	b	1630	tá	táa	war	efǐtá	bitá	mvíta	
LH	b	1686	tààtá	taatá	father	abótatá	bátatá	táatu	
LH	a	1895	jàdí	jadí	young girl	omwáli	mwályi		
LH	b	2013	yíná	jǐná	hole	ekyúna	mwíná	číiná	
HH	b	2133	yòngó	jongó	brain	obóngo	bóngó	bóonko	
LH	a	2140	jòjá	jojá	body hair	olwéya	lóya	bóoya	
LH	a	2168	yùmbá	(j)umbá	house	enyúmbá	nyúmba		

R LH	T b	G no ps110	PB-G ɕĩmbĩ	PB-M ɕĩmbi	gloss cowry	Kinande eyisĩmbi eyĩsĩmbi	Tembo lúsembe	Luba	Lingala
LH LH 12	b b	ps361	nònj kĩmbú	(j)unj	bird bad smell	enyönyu ekikumbo	esĩmbu	nyúúnyú	
LL	a	112	bìdĩ	bidi	body	omubiri	múbílí	múbídĩ	
LL	b	519	dèdù	dedu	beard	olulèry	lúréfú		mandéfu
LL	a	664	dòngò	dongo	line of objects	omulòndo	múlóngó	múlóóngú	molóngó
LL	a	756	gàbò	gabo	shield	engäbo	ngábó	ngábú	
LL	b	786	gàngà	ganga	doctor	omúganga			móganga
LL	a	844	gòmà	goma	drum	engöma	ngómá	ngómá	
LL	b	855	gòndè	gonde	moon	omugenda		ngóóndó	
LL	a	884	gùdù	gudu	leg	okugülü	kúúlú	múkolu	likolo
LL	a	888	gùdùbè	gudube	pig	engulübe	ngúlúbé	ngúlúbé	ngúlu
LL	a	894	gùmbà		barren woman	omugümba	ngúmbá	nkúúmbá	
LL	a	917	jàdà	jada	hunger	enzäla		nzälá	
LL	a	ps351	nàmà	(n)ama	meat	enyäma	nyámá		nyama
LL	a	ps89	cèkà		laughter	amasëka		ɕíséká	
LL	a			bata	duck	ekibata		ɕíbátá	libata
LL	a			ɕĩto	heavy	ekjĩto	búsító	bújítú	mozito

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