

Tone split and tone replacement:
diachronic pathways to a third tone level
in 'western' SBB languages (Central Africa)

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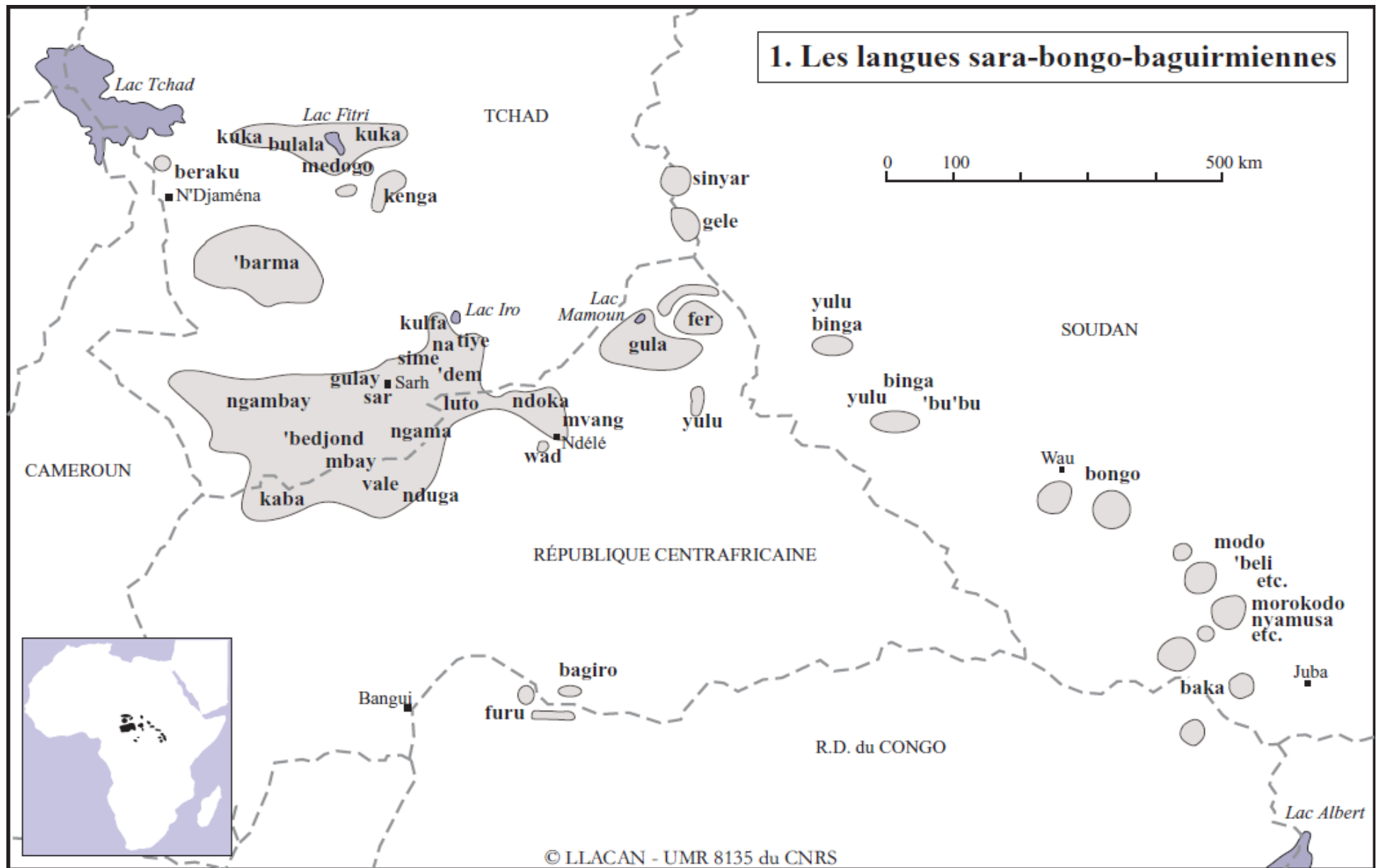
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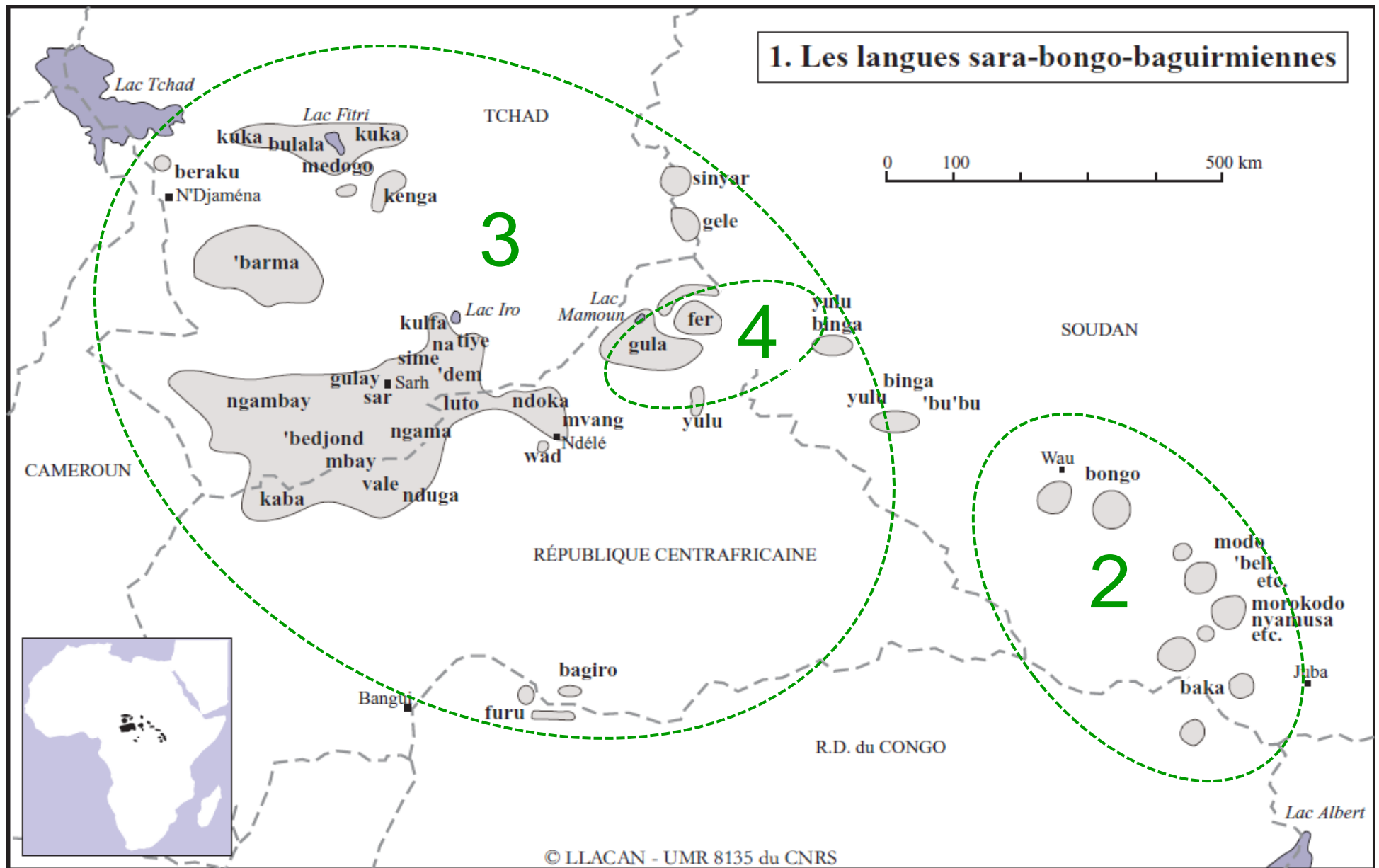


Photo Llacan

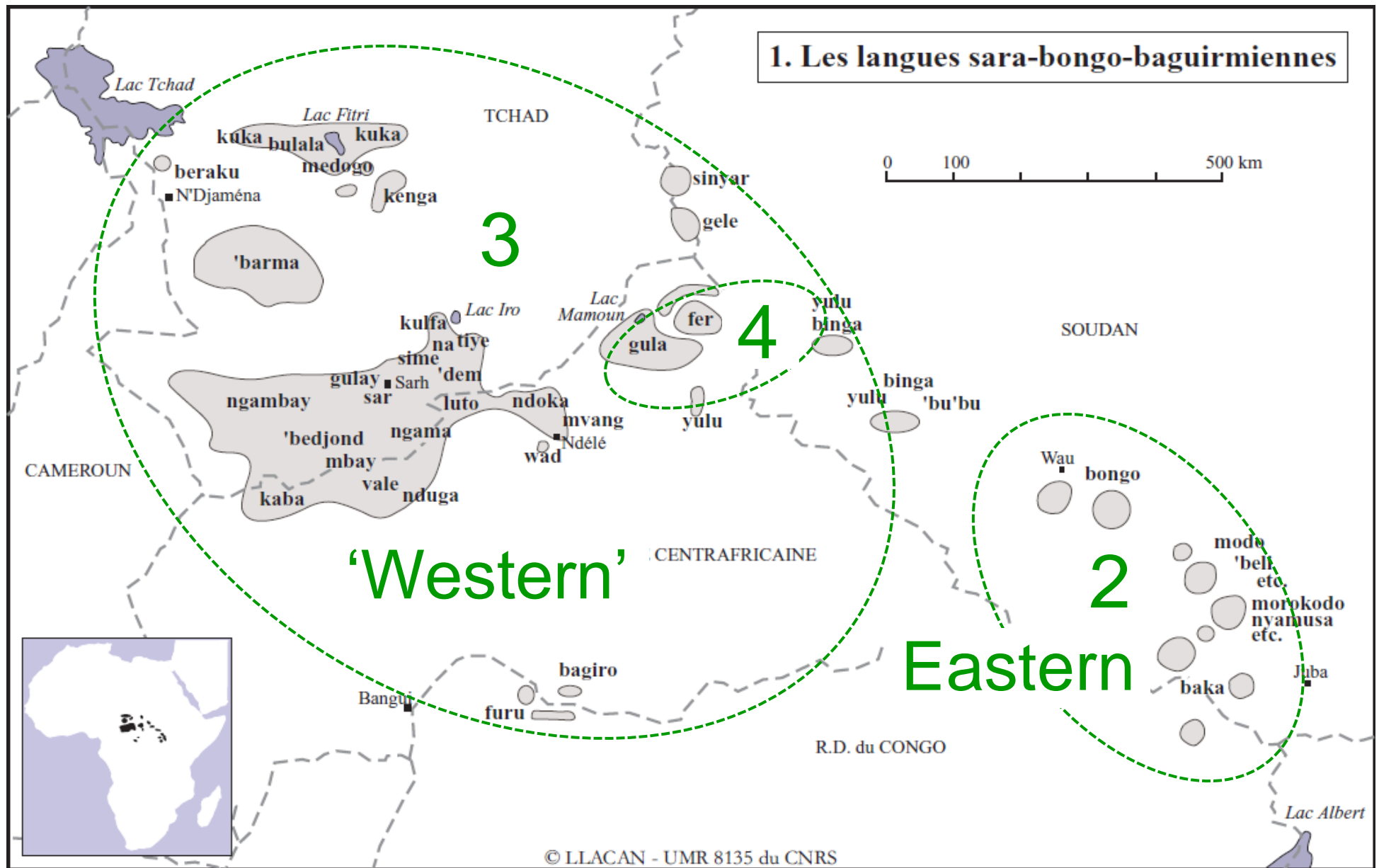
To the memory of
Pierre Nougayrol
1946-2023



Sara-Bongo-Bagirmi (SBB) languages (Sudan as before 2011)



Sara-Bongo-Bagirmi (SBB) languages (Sudan as before 2011): tone systems



Sara-Bongo-Bagirmi (SBB) languages (Sudan as before 2011): tone systems

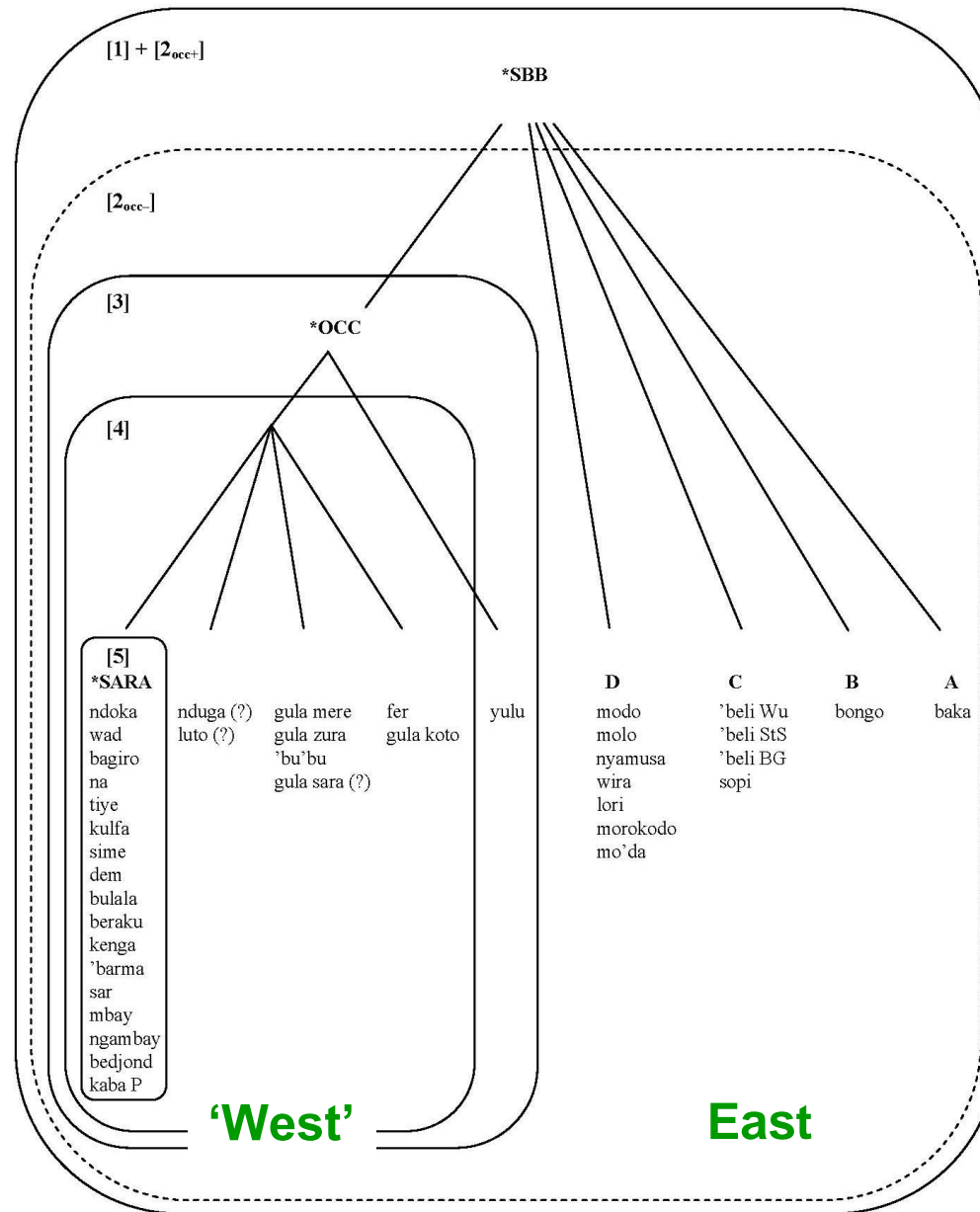
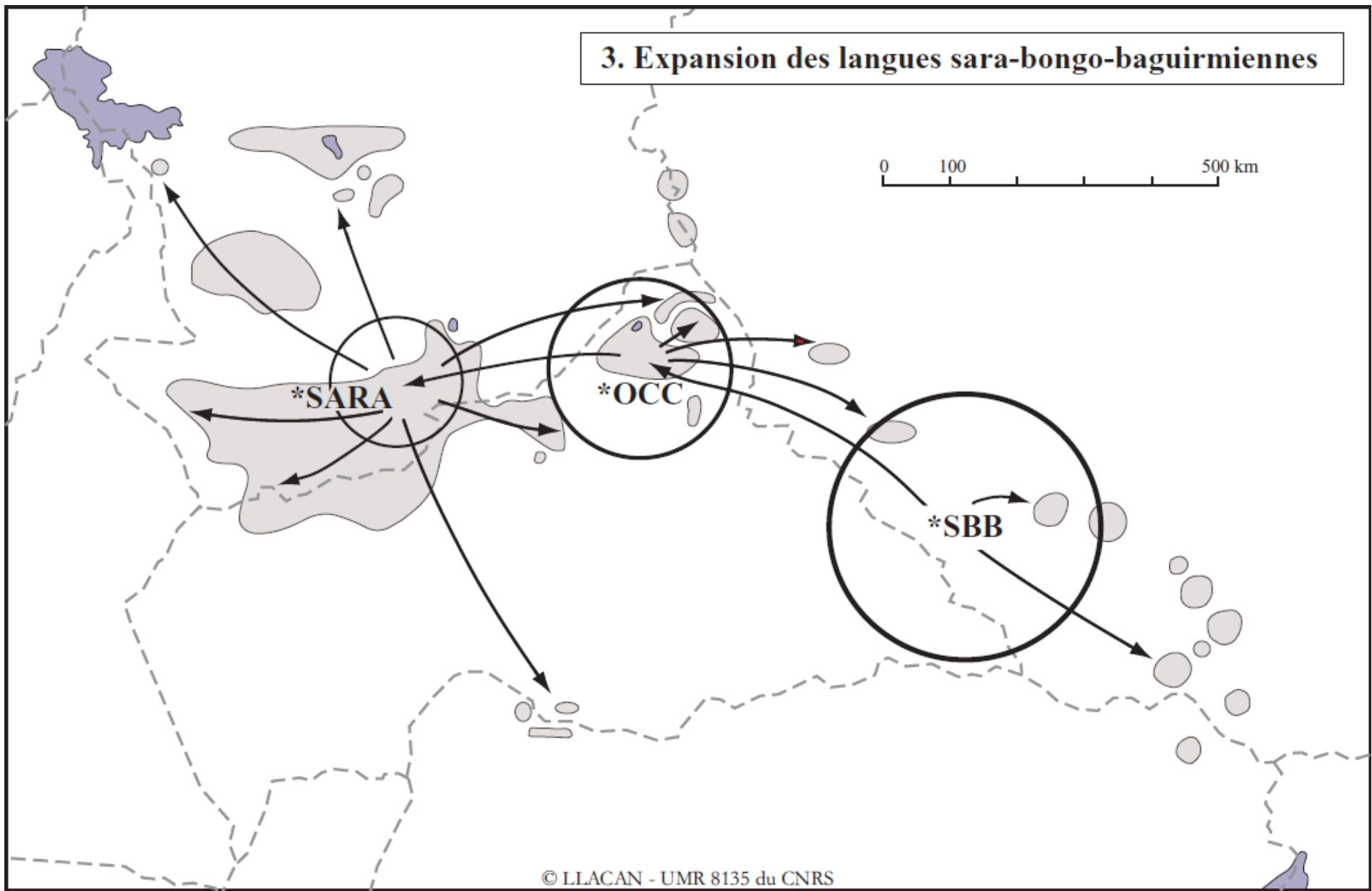


Diagram of SBB languages filiation (revised 2015)



SBB languages expansion (*OCC = *Western)

<i>Eastern</i>		<i>‘Western’</i>		
Bongo	Modo	Yulu	Bagiro	
(L)L	LL	LL	LL	
pòdũ	pàdũ	(pàd(ə) ?)	fàdũ	‘fire’
yà	òlè	ùlè, òlè	w-òyè	‘(s)he dies’
LH	LH	LM = eLM	LM	
bòdũ	bàdũ	bääd(ə)	bàdũ	‘warthog’
(èbè)	èbé	è?ə	àbē	‘(s)he leaves’
HH	HH	MM	MM	
ɲíhí	ɲépé	ɲēēp(ə)	nāfē	‘moon’
mí-cú	m-ósó	m-ōcə	m-ūsō	‘I fall’

Main tonal correspondences (Eastern H = ‘Western’ M)

*SBB & eastern languages 2 tone levels	>	*OCC & 'western' languages 3 tone levels	>	Yulu, Fer & Gula Koto 4 tone levels
		High = 3		High = 3
High = 2		Mid = 2		Mid = 2
Low = 1		Low = 1		Low = 1
				eLow = 0

Tone systems and conventional tone level encoding

*SBB & eastern languages 2 tone levels	*OCC & 'western' languages 3 tone levels	Yulu, Fer & Gula Koto 4 tone levels
<p>11 : LL 22 : HH 12 : LH</p>	<p>11 : LL 22 : MM 32 : HM 31 : HL 12 : LM</p>	<p>11 : LL 00 : eLeL 10 : LeL 22 : MM 02 : eLM 32 : HM 31 : HL</p>

Reading of disyllabic tone patterns (a selection)

Goal of this paper

*SBB > *OCC
*1/*2 *1/*2/*3

Verbs: tone split
(morphologically conditioned)

*2 → *2
*2 → *3

Nouns: tone replacement
(contact?)

*1, *2 // *3 ← ?

1. Verb tones

*[CV]	—
*[VCV]	60
*[CVCV]	10

Syllabic patterns of reconstructed *SBB verbs (updated 2023)

	ùbó ‘build’ 12//12/22	ósó ‘fall’ 22//12/22	ùdí ‘cook’ 11//11/21	ánò ‘eat’ 21//11/21
S1	m-úbó	m-ósó	m-údí	m-ánò
S2	úbó	ósó	údí	ánò
S3M	bò ùbó	bò òsó	bò ùdí	bò ànò
SLEX	N ùbó	N ósó	N ùdí	N ánò
.../...				

VCV : lexical pattern (SLEX) (> citation form)

VCV : 1st syllable tone lowered by S3M *b*ò

VCV : 1st syllable tone raised by S1 *m*-, S2 \emptyset -

Vowel initial verb tone alternations in the ‘Definite/Perfective’:

Modo (A.M. Persson 1981)

	èèsā ‘sew’ 12/22	òḡè ‘eat’ 11/21	īītè ‘cut (w. knife)’ 21/31
S1	m-ēēsā	m-ōḡè	m-íītè
S2	ēēsā	ōḡè	íītè
S3	èèsā	òḡè	īītè
SLEX	N èèsā	N òḡè	N īītè
.../...			

VCV : 1st syllable low *or* mid tone (S3, SLEX) (> citation form)

VCV : 1st syllable mid *or* high tone (S1, S2)

Vowel initial verb tone alternations in the ‘Definite/Perfective’:
 Yulu (P.B.)

	èndā ‘put up’ 12/22	èndà ‘hit’ 11/32
S1	m-ēndā	m-éndà
S2	ēndā	éndà
S3	èndā	èndà
SLEX	N èndā	N èndà
.../...		


VCV : 1st syllable low tone (S3, SLEX) (> citation form)

VCV : 1st syllable mid/high tone (S1, S2)

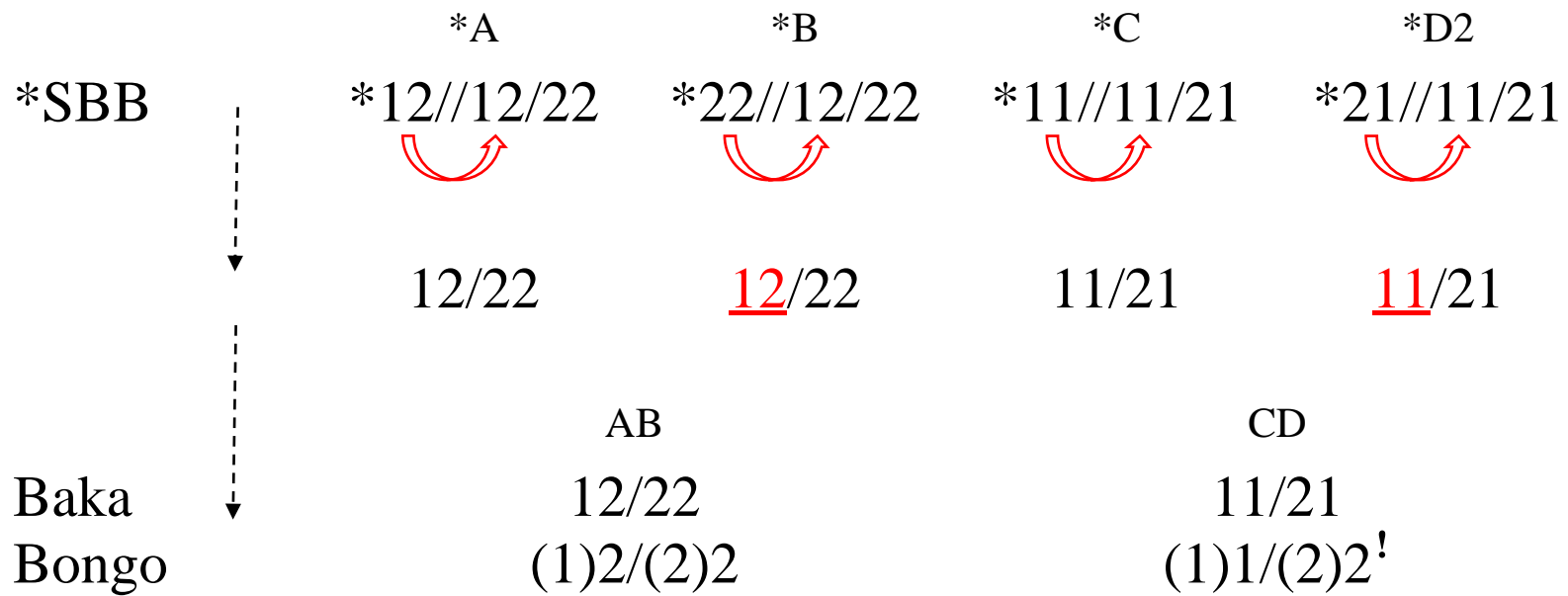
Vowel initial verb tone alternations in the ‘Definite/Perfective’:
Sar (P. Palayer 1970)


*SBB	*A *12//12/22	*B *22//12/22	*C *11//11/21	*D2 *21//11/21
Modo	A 12//12/22	B 22//12/22	C 11//11/21	*D2 21//11/21
Baka	AB 12/22		CD 11/21	
Bongo	AB (1)2/(2)2		CD (1)1/(2)2 [!]	
*OCC	*AB *12/22		*C *11/21	*D *21/31
Yulu	AB 12=02/22		C 11=00/21=20	D 21=20/31=30
Gula Koto	ABC (1)1/(2)2			D 10/31
*SARA	*AB *12/22		*CD *11/31	
Na	AB 12/22		CD 11/31	
Kenga	AB 12/22		CD 12/31	

Verb tone classes and correspondences (1)

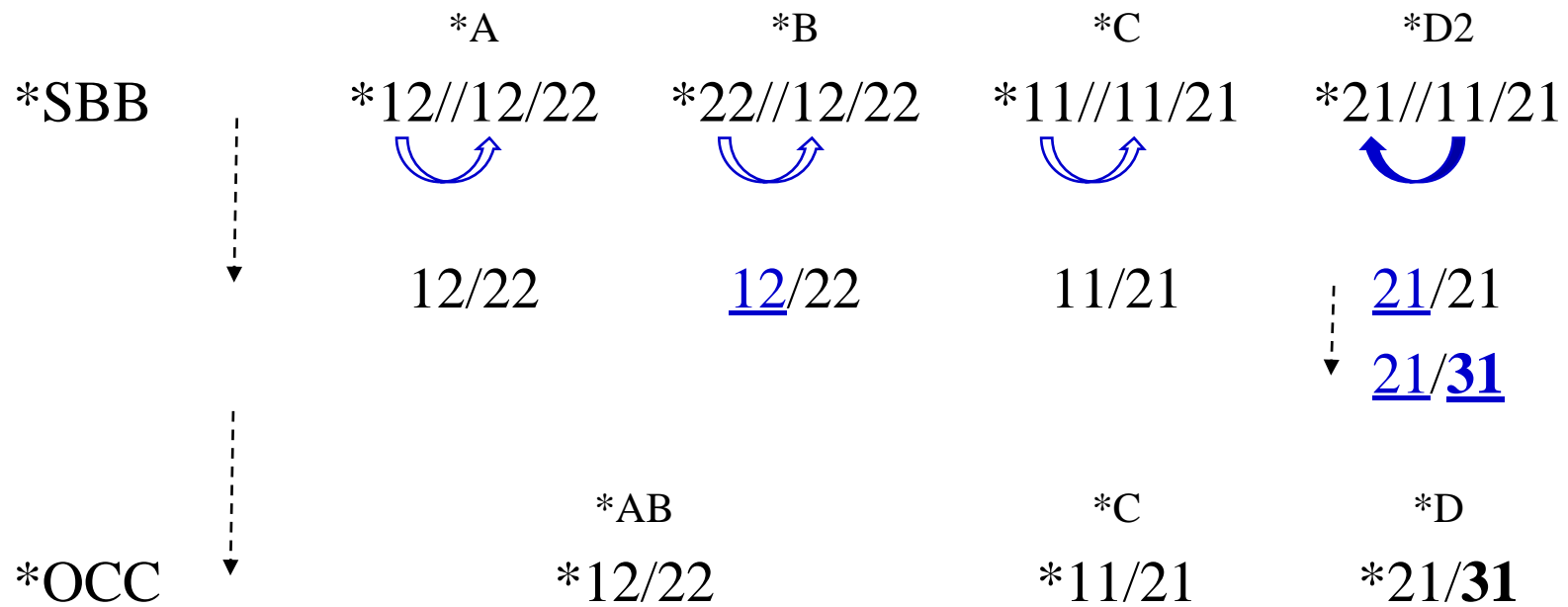
	*SBB	*A *12//12/22	*B *22//12/22	*C *11//11/21	*D2 *21//11/21
	Modo	A 12//12/22	B 22//12/22	C 11//11/21	*D2 21//11/21
	Baka	AB 12/22		CD 11/21	
	Bongo	AB (1)2/(2)2		CD (1)1/(2)2!	
	*OCC	*AB *12/22		*C *11/21	*D *21/31
	Yulu	AB 12=02/22		C 11=00/21=20	D 21=20/31=30
	Gula Koto	ABC (1)1/(2)2			D 10/31
	*SARA	*AB *12/22		*CD *11/31	
	Na	AB 12/22		CD 11/31	
	Kenga	AB 12/22		CD 12/31	


Verb tone classes and correspondences (2)





*SBB	*A *12//12/22	*B *22//12/22	*C *11//11/21	*D2 *21//11/21
Modo	A 12//12/22	B 22//12/22	C 11//11/21	*D2 21//11/21
Baka	AB 12/22		CD 11/21	
Bongo	AB (1)2/(2)2		CD (1)1/(2)2!	
*OCC	*AB *12/22		*C *11/21	*D *21/31
Yulu	AB 12=02/22		C 11=00/21=20	D 21=20/31=30
Gula Koto	ABC (1)1/(2)2			D 10/31
*SARA	*AB *12/22		*CD *11/31	
Na	AB 12/22		CD 11/31	
Kenga	AB 12/22		CD 12/31	



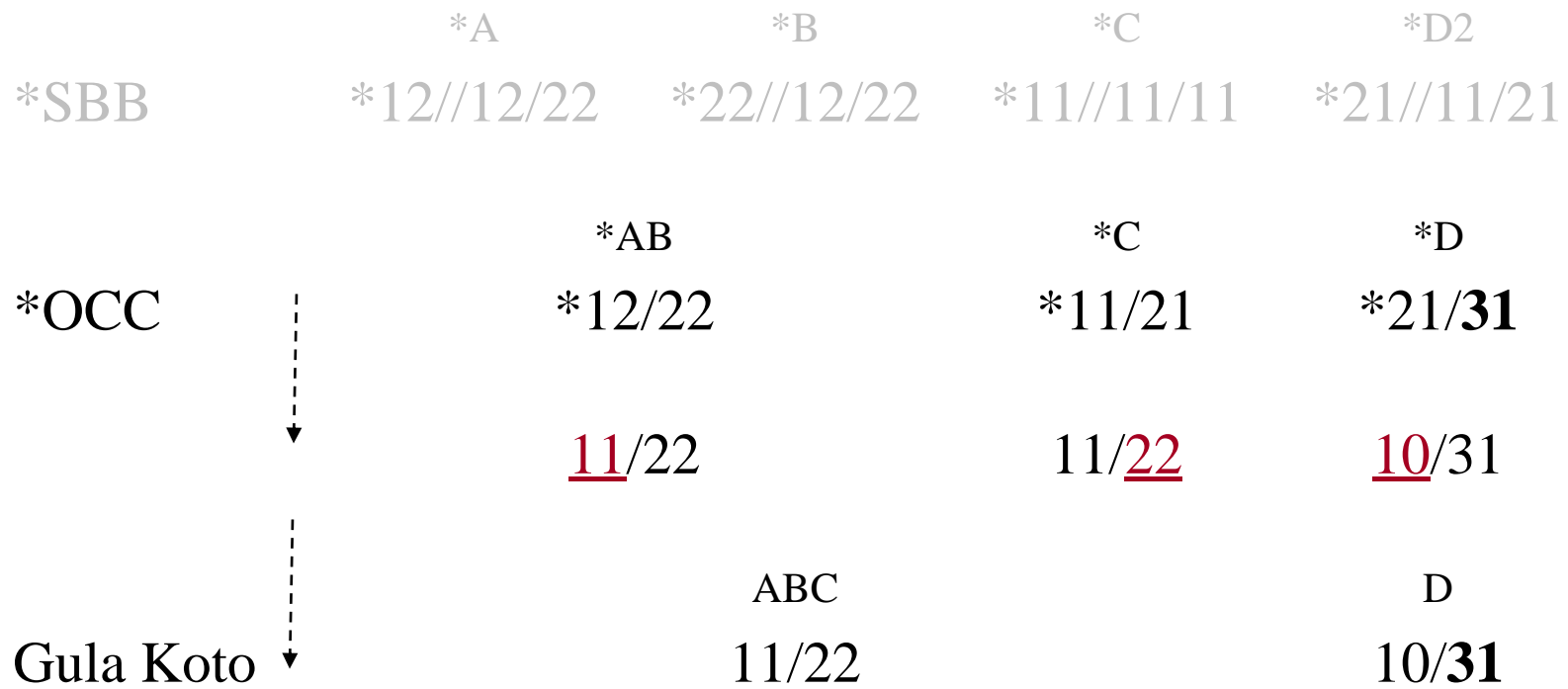


*SBB	*A *12//12/22	*B *22//12/22	*C *11//11/21	*D2 *21//11/21
Modo	A 12//12/22	B 22//12/22	C 11//11/21	*D2 21//11/21
Baka	AB 12/22		CD 11/21	
Bongo	AB (1)2/(2)2		CD (1)1/(2)2!	
*OCC	*AB *12/22		*C *11/21	*D *21/31
Yulu	AB 12=02/22		C 11=00/21=20	D 21=20/31=30
Gula Koto	ABC (1)1/(2)2			D 10/31
*SARA	*AB *12/22		*CD *11/31	
Na	AB 12/22		CD 11/31	
Kenga	AB 12/22		CD 12/31	

Verb tone classes and correspondences (3)

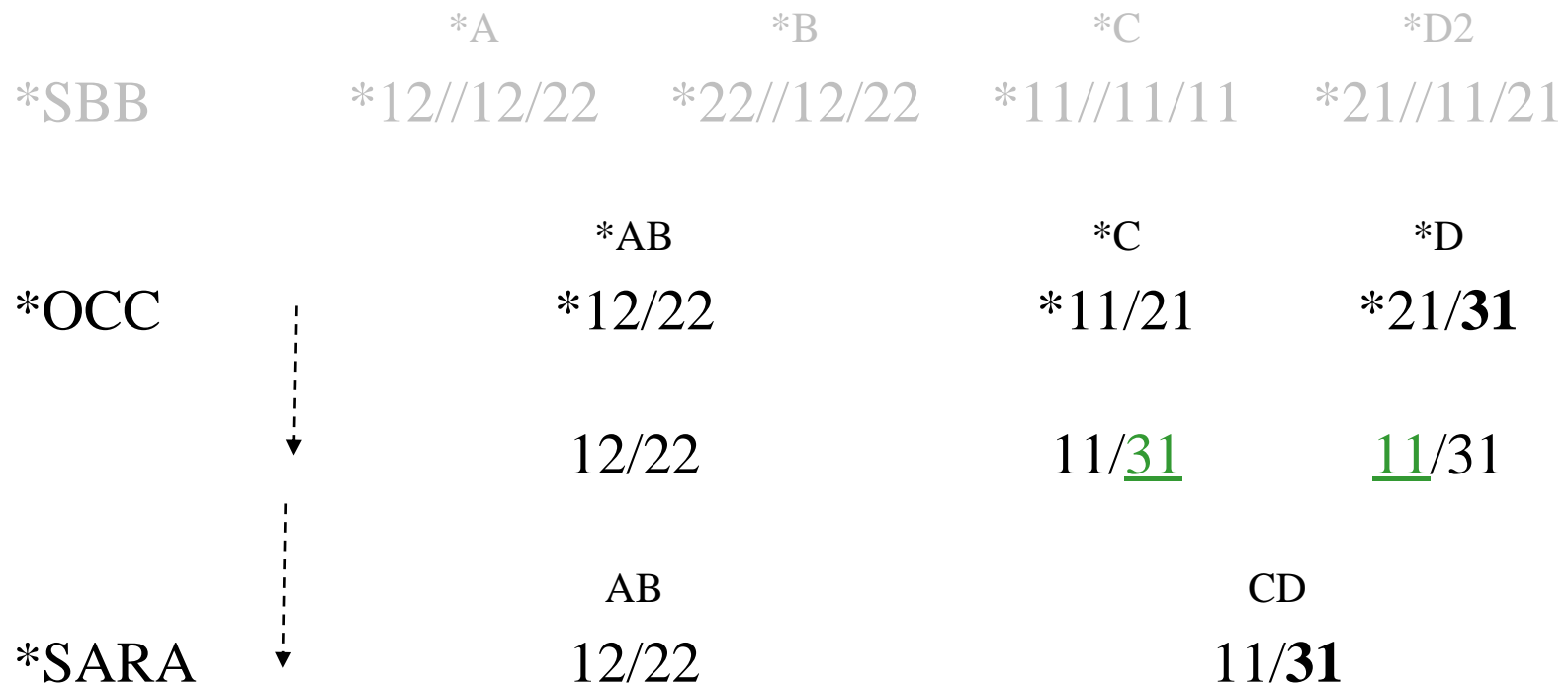
*SBB	*A *12//12/22	*B *22//12/22	*C *11//11/21	*D2 *21//11/21
Modo	A 12//12/22	B 22//12/22	C 11//11/21	*D2 21//11/21
Baka	AB 12/22		CD 11/21	
Bongo	AB (1)2/(2)2		CD (1)1/(2)2!	
*OCC	*AB *12/22		*C *11/21	*D *21/31
Yulu	AB 12=02/22		C 11=00/21=20	D 21=20/31=30
Gula Koto	ABC (1)1/(2)2			D 10/31
*SARA	*AB *12/22		*CD *11/31	
Na	AB 12/22		CD 11/31	
Kenga	AB 12/22		CD 12/31	

Verb tone classes and correspondences (4)



*SBB	*A *12//12/22	*B *22//12/22	*C *11//11/21	*D2 *21//11/21
Modo	A 12//12/22	B 22//12/22	C 11//11/21	*D2 21//11/21
Baka	AB 12/22		CD 11/21	
Bongo	AB (1)2/(2)2		CD (1)1/(2)2!	
*OCC	*AB *12/22		*C *11/21	*D *21/31
Yulu	AB 12=02/22		C 11=00/21=20	D 21=20/31=30
Gula Koto	ABC (1)1/(2)2			D 10/31
*SARA	*AB *12/22		*CD *11/31	
Na	AB 12/22		CD 11/31	
Kenga	AB 12/22		CD 12/31	

Verb tone classes and correspondences (5)



*SBB	*A *12//12/22	*B *22//12/22	*C *11//11/21	*D2 *21//11/21
Modo	A 12//12/22	B 22//12/22	C 11//11/21	*D2 21//11/21
Baka	AB 12/22		CD 11/21	
Bongo	AB (1)2/(2)2		CD (1)1/(2)2!	
*OCC	*AB *12/22		*C *11/21	*D *21/31
Yulu	AB 12=02/22		C 11=00/21=20	D 21=20/31=30
Gula Koto	ABC (1)1/(2)2			D 10/31
*SARA	*AB *12/22		*CD *11/31	
Na	AB 12/22		CD 11/31	
Kenga	AB 12/22		CD 12/31	

Verb tone classes and correspondences (6)

*SBB	*A *12//12/22	*B *22//12/22	*C *11//11/21	*D2 *21//11/21
Modo	A 12//12/22	B 22//12/22	C 11//11/21	*D2 21//11/21
Baka	AB 12/22		CD 11/21	
Bongo	AB (1)2/(2)2		CD (1)1/(2)2!	
*OCC	*AB *12/22		*C *11/21	*D *21/31
Yulu	AB 12=02/22		C 11=00/21=20	D 21=20/31=30
Gula Koto	ABC (1)1/(2)2			D 10/31
*SARA	*AB *12/22		*CD *11/31	
Na	AB 12/22		CD 11/31	
Kenga	AB 12/22		CD 12/31	



Verb tone classes and correspondences (7)

*SBB	*A *12//12/22	*B *22//12/22	*C *11//11/21	*D2 *21//11/21
Modo	A 12//12/22	B 22//12/22	C 11//11/21	*D2 21//11/21
Baka	AB 12/22		CD 11/21	
Bongo	AB (1)2/(2)2		CD (1)1/(2)2!	
*OCC	*AB *12/22		*C *11/21	*D *21/31
Yulu	AB 12=02/22		C 11=00/21=20	D 21=20/31=30
Gula Koto	ABC (1)1/(2)2			D 10/31
*SARA	*AB *12/22		*CD *11/31	
Na	AB 12/22		CD 11/31	
Kenga	AB 12/22		CD 12/31	

Verb tone classes and correspondences (8)

*SBB*A : *12//*12/*22

Eastern languages			*OCC*AB : *12/*22				
A	AB	AB	AB	AB	AB	AB	
Modo	Bongo	Baka	Yulu	Gula Koto	Na	Kenga	
12//12/22	(1)2/(2)2	12/22	12=02/22	1(1)/2(2)	12/22	12/22	
àḡmí//àḡmí/áḡmí	óḡ/óḡ	èḡí/éḡí	ààḡḡ/āāḡḡ		òḡḡ/ōḡḡ	òòḡḡ/ōōḡḡ	‘be white’
òmó/òmó/ómó	má/má		òòmḡ/ōòmḡ				‘cover, hide’
àpí/àpí/ápí			àpḡ/āpḡ	èhè/ēhē			‘burst, explode’
òzì/òzì/ózì			òòḡḡ/ōōḡḡ		òḡḡ/ōḡḡ		‘chase’

*SBB*B : *22//*12/*22

Eastern languages			*OCC*AB : *12/*22				
B	AB	AB	AB	ABC	AB	AB	
Modo	Bongo	Baka	Yulu	Gula Koto	Na	Kenga	
22//12/22	(1)2/(2)2	12/22	12=02/22	1(1)/2(2)	12/22	12/22	
úwé/úwé/úwé	yé/yé	èwé	òòyḡ/ōōyḡ	ày/ay	è7ē	ààyḡ/āāyḡ	‘drink’
útó/útó/útó	tá/tá		òòcḡ/ōōcḡ	òt/òt	ìtḡ/ìtḡ		‘carry’
úfó/úfó/úfó	fú/fú		òòfḡ/ōōfḡ	òj/òj	òyḡ/ōyḡ	ùḡḡ/ùḡḡ	‘plait’
ómó/ómó/ómó	òmó/ómó		òòmḡ/ōòmḡ		àmḡ/àmḡ	ààmḡ/āāmḡ	‘be pregnant’

Verbs: lexical illustrations of *SBB*A and *SBB*B reflexes

*SBB*C : *11//11/21

Eastern languages			*OCC*C : *11/21				
C Modo 11//11/21	CD Bongo (1)1/(2)2 ¹	CD Baka 11/21	C Yulu 11=00/21=20	ABC Gula Koto 1(1)/2(2)	CD Na 11/31	CD Kenga 12/31	
òlè//òlè/ólè	yù/yù ¹	òyò/óyò	ùlè/ùlè	òy/òy	ò/ò	òòyò/óóyò	‘die’
òṅò//òṅò/óṅò	òṅ/óṅ ¹	ànò/ánò	òṅè/òṅè	òṅ/òṅ	òṅò/óṅò	òòṅò/óóṅò	‘eat’
àtò//àtò/átò	òtù/ótù ¹ ‘rot’		ààcè/ààcè	àt/àt	àtù/átù	òòtò/óótò	‘smell (bad)’
(ùlù/ùlù/ùlù ?)*	èli/éli ¹	ùlù/ùlù		òli/	òli/òli	ùlù/ùlù	‘swallow’

* ‘suck liquid’

*SBB*D2 : *21//11/21

Eastern languages			*OCC*D : *21/*31				
D Modo 21//11/21	CD Bongo (1)1/(2)2 ¹	CD Baka 11/21	D Yulu 21/31	D Gula Koto 10/31	CD Na 11/31	CD Kenga 12/31	
úpò//úpò/úpò		òfò/ófò	òòfè/óófè				‘kill’
ádí//ádí/ádí	èdì/édì ¹	(edj)	ààdè/áádè	èd/éd ¹	àrì/árì	èèdè/éédè	‘rain’
átì//átì/átì	ètì/étì ¹	ècì/écì		èt/ét ¹	àtì/átì		‘sneeze’
úgù//úgù/úgù	gù/gù ¹			ùg/ùg	ùgù/ùgù	ùùgù/ùùgù	‘scratch’

Verbs: lexical illustrations of *SBB*C and *SBB*D2 reflexes

2. Noun tones

*[CV]	5
*[VCV]	14
*[CVCV]	84
*[CVRCV]	6

Syllabic patterns of reconstructed *SBB nouns (updated 2023)

*SBB	*11	*12	*21a	*21b	*21c	*22
Modo	11	12=2	21=1	11		22
Baka	11	12	21=1	11		22
Bongo	11	12	22 [!]	11		22
*OCC	*11	*12	*21a	*21b	*22	
Yulu	11=00	12=02	21=20		22	
Gula Koto	11	11=2	22	10	22	
Gula Zura	22			11	22	
*SARA	*11	*12=*(1)2	22	*11	22	
Ndoka	11	12=2	22	11	22	
Bagiro	11	12=2	22	11	22	
Na	11	12=2	22	11, (12 ?)	22	
Kenga	11	12, 11=2	22	11	22	

Nouns: *SBB primary tone patterns and correspondences

*SBB*11

Eastern languages			*OCC*11 (or *31)				
Modo 11	Bongo 11	Baka 11	Yulu 11=00	Gula Koto 11	Na 11	Kenga 11	
kòmò	kòmò	kòmò	(kāām(ə) !?)	kàm	kàm	kààmà	‘eye, face’
kòtò	kòtò	(mokoto)	kòòt(ə)			kàrtà	‘sterility, sterile’
	kùdì		kěj(ə)	kèḍ	kùjè		‘worm, grub, maggot’
dòkùròsò		(kési)		³¹ kéc`	kòkè		‘iron, hoe’
(gàlí !?)	gèl		gääl(ə)	gèl	³¹ gàlì	jèèlè	‘left (side)’
tìbò			vööv(ə)		³¹ júbù	³¹ rúúbù	‘bellows’

*SBB*12

Eastern languages			*OCC*12 (or *OCC*31/*32/*13)				
Modo 12	Bongo 12	Baka 12	Yulu 12=02	Gula Koto 11	Na 12	Kenga 12, 11	
màá	màhá	(mbasa)	mààs(ə)	màs	màsā	mààsā	‘ <i>Tamarindus indica</i> ’
bàdǒ	bòdú	(uɔɖu)	bääd(ə)	vàḍ	bàrū	bòòdò	‘warthog’
bú	hìbú	sùbú		kùḅ	bū	ùùbū	‘oil, (grease)’
kànó				³² kún̄	³² kúnū	³¹ kón̄	‘nose’
(tòkpè !?)	tìkí			tìt	tìhī, ¹³ tìhí	tìikì	‘bowels’
rùzú	(rùjù)		³⁰ ngúj(ə)		¹³ ndùjú	rùjū	‘flour’

Nouns tones: *SBB primary tone patterns and irregular *OCC secondary tone patterns (.../...)

*SBB*21a

Eastern languages			*OCC*21 (or *OCC*31/*32/*23)				
Modo (2)1	Bongo 22 ¹	Baka 21	Yulu 21=20	Gula Koto 22	Na 22	Kenga 22	
rúbò	líbó ¹ ngbálá ¹ léé ¹				nūbā mbā	nēbē	‘beehive’ ‘spear sp.’ ‘paternal aunt’
bì (kònò) (dókù ?)	bíhí ¹ kínó ¹ dúkú ¹	ísì dúkù	lēʔ(ə) bīs(ə) ³¹ kóón(ə) ³¹ dúúk(ə)	(nāy ?) bīs ³² kón̄ ³¹ dók`	³¹ bísi kōnō ²³ dōkú	³¹ bísi (kōrndō ?) dōōkō	‘dog’ ‘thorn’ ‘termite mound’

*SBB*21b

Eastern languages			*OCC*21b (or *OCC*31/*32)				
Modo 11	Bongo 11	Baka 11	Yulu 21=20	Gula Koto 10	Na 11	Kenga 11	
dòtàrà kàgbà	tàrà kògò hòmò	tàrà sòmò	tāà sāām(ə)	tà` kàd` (sòm-)	tà kàbà	tààrà òòmò	‘lip, mouth’ ‘leopard’ ‘nose’
tàndiyà kàdà kàhì	tànjà kàdà (gòhí ?)	(tandj) kàdà (gòsú)	tāānj(ə) kāāj(ə)	tànž ³¹ kád` ngàs`	tànjà kàjà ³² kásī	tèrènjè kààdà (kèèsē)	‘guineafowl’ ‘sun’ ‘cough’ (n.)

Nouns tones: *SBB primary tone patterns and irregular *OCC secondary tone patterns (.../...)

*SBB*21c

Eastern languages			*OCC*21 (or *OCC*31/*32)				
Modo 11	Bongo 11	Baka 11	Yulu 22	Gula Koto 22	Na 22	Kenga 22	
ndògò (mòyì ?)	ndùgù		ndōōg(ə)				‘price, trading’
gò	gò	ìrì gò	gōō	gō	yī gō		‘name’
sà	kùtá		màkōōt(ə)	³² kát ⁻	³¹ kútà	³¹ kórtò	‘nape, neck’
ηmà	càa		³¹ éc(ə)		sā		‘filter, cowrie, shield’
	ηòò	(uηa)	³¹ óóη(ə)	mām	mā		‘ox, cow’
							‘termite sp.’

*SBB*22

Eastern languages			*OCC*22 (or *OCC*31/*32/*23)				
Modo 22	Bongo 22	Baka 22	Yulu 22	Gula Koto 22	Na 22	Sar 22	
kénzé	kínjí	kénzé	kēēnj(ə)	kānz	kānjē	kānjə	‘fish’
népé	níhí	éfé	ñēēp(ə)	lēhē	nōhē	nāā	‘moon’
kúpó	kúhú	kófó	kōōf(ə)	kōhō	kōhō	kōō	‘seed’
	hídó	(sida)	sūūj(ə)	³² sód ⁻		yēdā	‘ <i>Anogeissus leiocarpus</i> ’
yórí			³¹ sóór(ə)		²³ kīró	²³ yāró	‘dirt’
kólógbé	hígé	(sige)	³² síg(ə)	³² kéd ⁻	³² kóbē	³² yégē	‘rat, mouse’

Nouns tones: *SBB primary tone patterns and irregular *OCC secondary tone patterns (end)

*SBB					
Modo					
Baka					
Bongo					
*OCC	*31	*32	*3-	*13	*23
Yulu	31=30	32	3-	(?)	/
Gula Koto	31	32	3-	13	23
Gula Zura	31	32	3-	13	33
*SARA	*31	*32	*3-	*13	*23
Ndoka	31	32	3-	13	33
Bagiro	33 [!]	32	3-	13 [!]	/
Na	31	32	3-	13	23
Kenga	31		3-	(?)	22
Ngambay	3(2)		3-	13	23

Nouns: *OCC secondary tone patterns and correspondences

*OCC	*31	'calabash sp.'	'stalk, sugar cane'	'sorghum sp.'
Yulu	31=30			
Fer	31, 33, 30		kád	jélà
Gula Koto	31			
Gula Zura	31	gómò	kádà	jál`
Gula Mere	31	gómò	kádà	jílà
*SARA	*31			
Ndoka	31	góm(ù)		
Bagiro	33'	gómó'		
Na	31		kádà	
Sime	31		gádà	
Kenga	31		kárdã	
'Barma	31			
Ngam	33		gádí	
Sar	31		kádè	
Mbay	33		kádó	
Ngambay	3(2)		kár, kār	

Nouns: regular instances of *OCC secondary tone pattern *31 in 'western' lexical series

*OCC	*32	‘ant sp.’	‘louse’	‘ant sp.’	‘cane rat’	‘porridge’	‘groundnut’
Yulu	32	tíír(ə)		(díŋ(ə) ?)			
Fer	32	(tú ⁻ ?)	ngísā	túngā	wínd ⁻ (wínl ⁻ ?)		
Gula Koto	32	dír	ngá̄s		íl ⁻	véy	
Gula Zura	32		ngá̄s	téjē	í ī	váy	íl ⁻
Gula Mere	32	dúrū	ngísā	téjē	í ī	víyā	íl ⁻
*SARA	*32						
Ndoka	32	tírī	ngísā		yélī, yélī	víyā	wólī
Bagiro	32	túlē	ngísā	tújē	yélī		
Na	32	tí ⁻	ngísā	tínā	-wóy	bíyā	wólī
Sime	32	túrū	ngísā	túngō	-húrī	bí(y)ā	wúlī
Kenga	31	tāntúúrù	gérsè	(tórónò ?)	yíli	bíriyà	úrlù, úrrù
’Barma	32, (31 ?)	tútúró/ù	ngírsā		wíl/i	bíyā	bólī
Ngam	32					bíyā	wíl ⁻ , wúl ⁻
Sar	32	tú	ngósā	tóyō	bí	bíyā	wúl ⁻
Mbay	32	túr	ngísā	tíyā	-wúr	bíyā	wúl ⁻
Ngambay	3(2)	túr	ngísā	tíyā	-úrī	bíyā	ból

Nouns: regular instances of *OCC secondary tone pattern *32 in ‘western’ lexical series

*OCC	*3-	‘ <i>Heterotis niloticus</i> ’	‘whistle, horn’	‘bag, (foreskin)’	‘house, (nest)’	‘horse’	‘mother’	‘pigeon, dove’	‘bug’
Yulu	3-	ngóól(ə)	mbáál(ə)	ḃóól(ə)					
Fer	3-			(ḃòl, bòl ?)	kíj̄				
Gula Koto	3-	ngól̄	mvál̄	ḃól̄, ḃól̄	kíz̄	sánd̄	kóḃ̄		táj̄
Gula Zura	3-	ngól̄̄	mvál̄	ḃól̄̄	kíz̄̄	sánd̄	kóḃ̄	dér̄̄	táj̄
Gula Mere	3-	ngól̄̄	mvól̄	ḃól̄̄	kíz̄̄	súndā	cónō, có̄	dér̄̄	táj̄à
*SARA	*3-								
Ndoka	3-	ngól̄̄, ngól̄̄	mvál̄		kúzù	síndā	kó̄	dér̄̄	táj̄à
Bagiro	3-	(ngól̄̄ ?)		(ḃól̄̄)	kúgí¹		kóḃ̄ó¹		
Na	3-	ngô	mbálè			kúndā	kô	dé̄	táj̄à
Sime	3-	ngóò	mbálè	ḃól̄̄	kújù	súndō	kó	dúr̄̄, díre	táj̄à
Kenga	3-		(bōfl̄̄ ?)	ḃóól̄̄	kújù	síndì, sínà	kóà	déér̄̄	(táj̄ ?)
’Barma	3-	ngól̄̄	(mbāyā)		kúj̄/ì	síndā	kúj̄/ù	dér̄/è	
Ngam	3-	ngór			kúj̄í	síndā	kó	dér	
Sar	3-	ngóṽ		(ḃól̄̄ ?)	kúj̄è	séndā	kóò, kúù	dér̄	
Mbay	3-	ngór		ḃól	kúj̄é	síndā	kóò	dér	tíyā-
Ngambay	3-	ngóř		ḃól	kúj̄ī	kúndā	kó	dár	

Nouns: regular instances of *OCC secondary tone patterns *3- in ‘western’ lexical series

*OCC	*13	‘blood’	‘story, tale’	*23	‘tail’	‘corpse’	‘bracelet, ring’
Yulu	(?)			/	(sòòl(ə) ?)		
Fer	13, 03	màń	ùn[´	23	sīlá		
Gula Koto	13	màng	hà[´	23	(sál)		
Gula Zura	13	màngá	ʔà[´	33	kál		
Gula Mere	13	màngá	wà[´é	33	kílá	nún	
*SARA	*13			*23			
Ndoka	13		dũrú, dǒlú	33	cílá		
Bagiro	13 [!]	màngá [!]		/	(kílā)		
Na	13			23	kīlá	nūnú	nīngá
Sime	13			23	kīlá	nūnú	(nīngá)
Kenga	(?)			22	yēlē		
’Barma	?			23	(yīlā)	nīn/í	
Ngam	12, 13			23		nīn	
Sar	13			23	kālá	nīn	nōngá
Mbay	13			23	(kālá-gē ?)	nīn	nīngá
Ngambay	13			23	(kílā ?)	nīn	(nīngá)

Nouns: regular instances of *OCC secondary tone patterns *13 and *23
in ‘western’ lexical series

Conclusion

1. Verb tones

- tone has both lexical and grammatical functions
- 'western' level 3-marked tone patterns are regular reflexes of former *SBB tone patterns
- tone split is grammatically conditioned (e.g. *SBB*21 > *OCC*21 OR *OCC*31)
- principle of *TONE SPLIT* (as a special case of *TONE CHANGE*): continuity of suprasegmental features

2. Noun tones

- tone has lexical function only
- 'western' level 3-marked tone patterns are *NOT* reflexes of former *SBB tone patterns but innovations of a later *OCC system
- principle of *TONE REPLACEMENT*: discontinuity of suprasegmental features (nouns may combine segments and tones dating back to different historical steps)

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