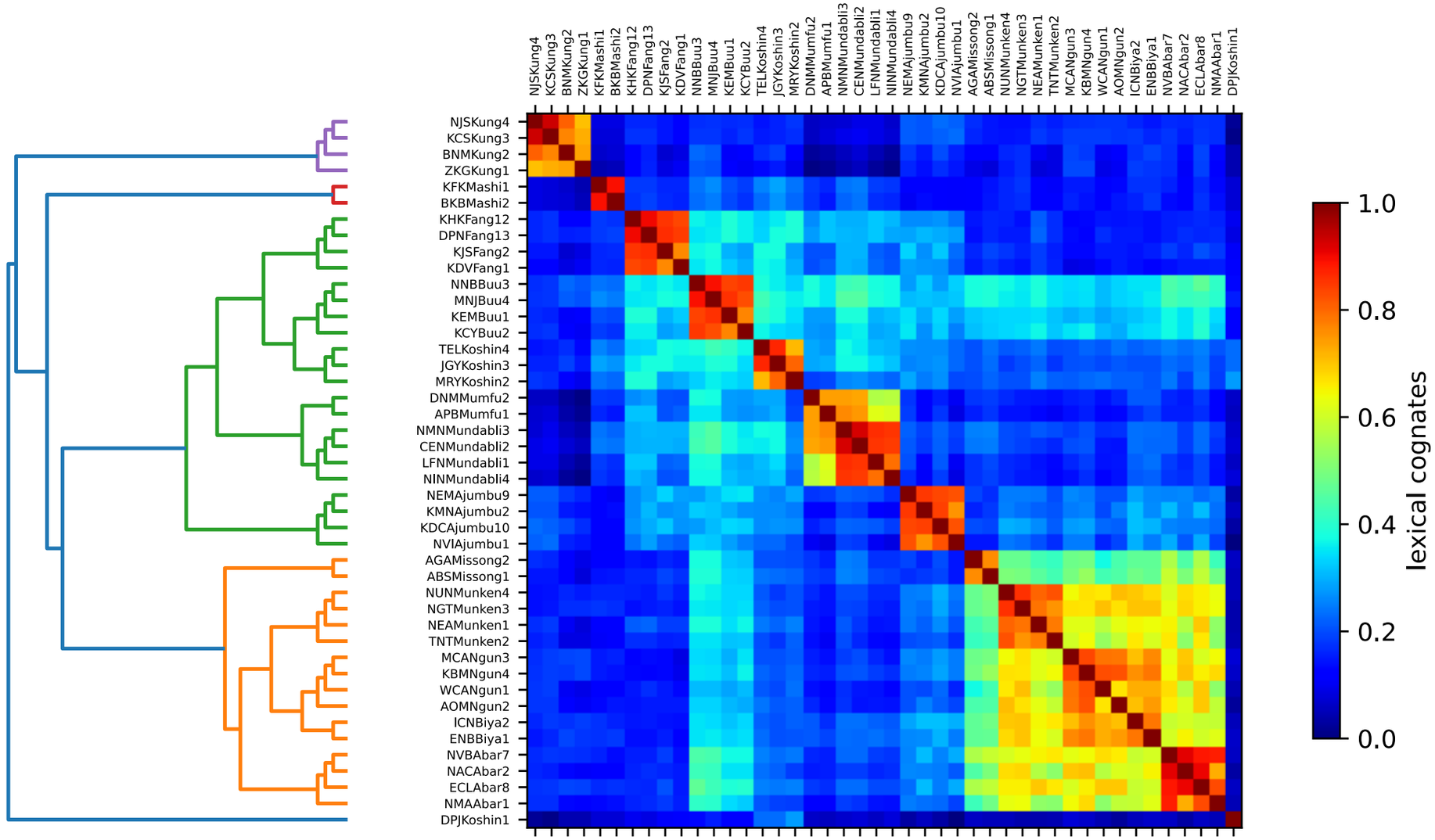


Individual-level lexical variation in the Bantu homeland and its implications for the development of Benue-Congo

Jeff Good
University at Buffalo
jcgood@buffalo.edu

West-central African linguistic history between Macro-Sudan Belt and Niger-Congo: Commemorating Diedrich Westermann's legacy and the 100th anniversary of the Berlin professorship for African languages, Humboldt University, 4–6 November, 2021

Acknowledgments

- Wordlist data collected by Nelson Ts. Tschonghongei, University of Yaoundé 1
- Buffalo-based co-researchers: Ling Bian, Pierpaolo Di Carlo, and Clayton Hamre, and Yujia Pan
- Local project manager: Achuo Christopher Ikom
- Local data manager: Charles Nyoh Abang
- The work is supported by funding from the US National Science Foundation: Documenting Endangered Languages, Linguistics, and Geographic and Spatial Sciences Programs

Individual-based approaches

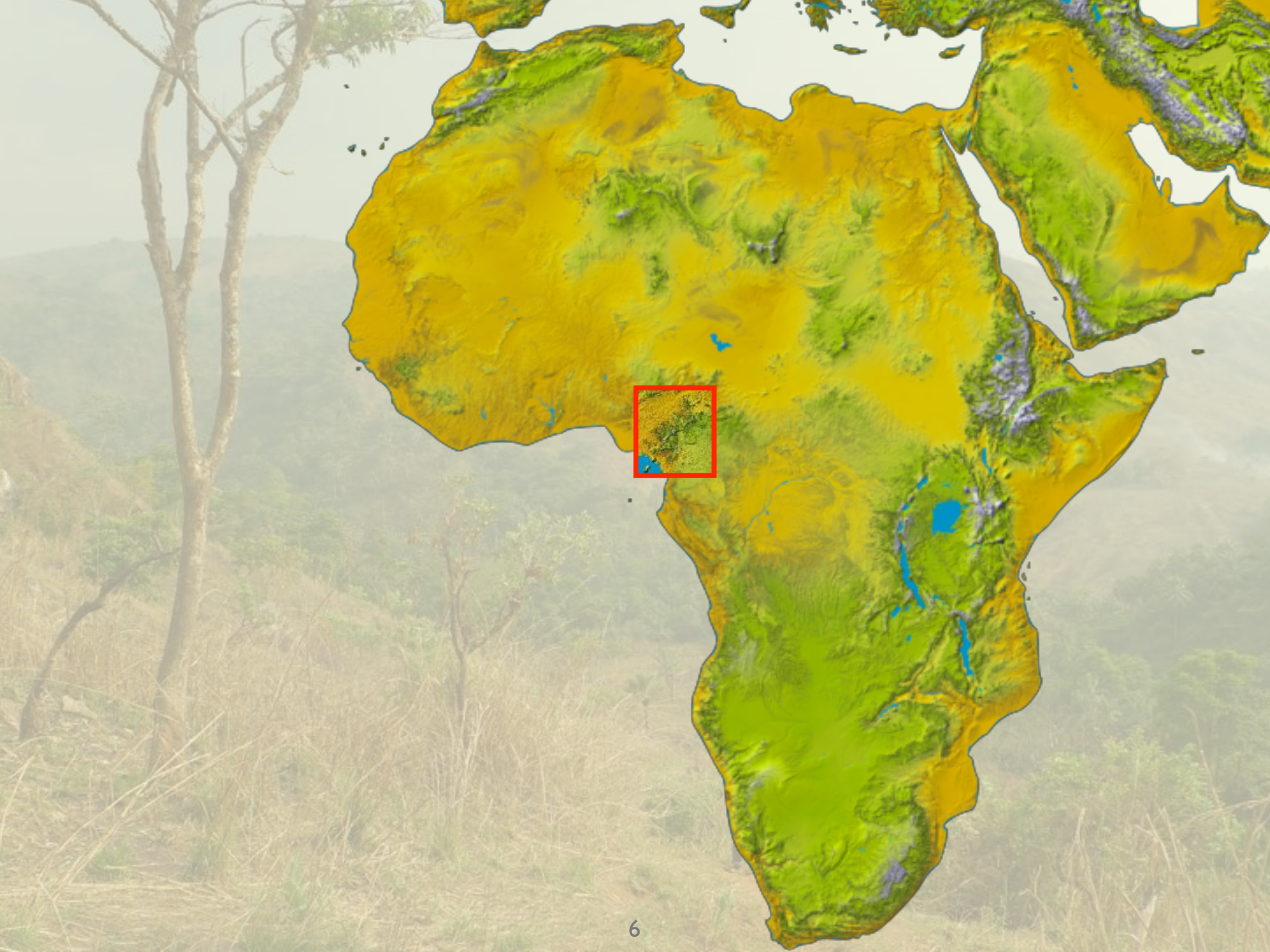
- A complete model of language diversification needs to be able to link individual-level dynamics to population-level ones
- Such work needs to be based on individual-level data that is grounded in the sociolinguistic realities of language users
- What sociolinguistic configurations should we reconstruct for Benue-Congo and what models of change result from this?
- Research strategy: Focus on a Benue-Congo "microcosm"

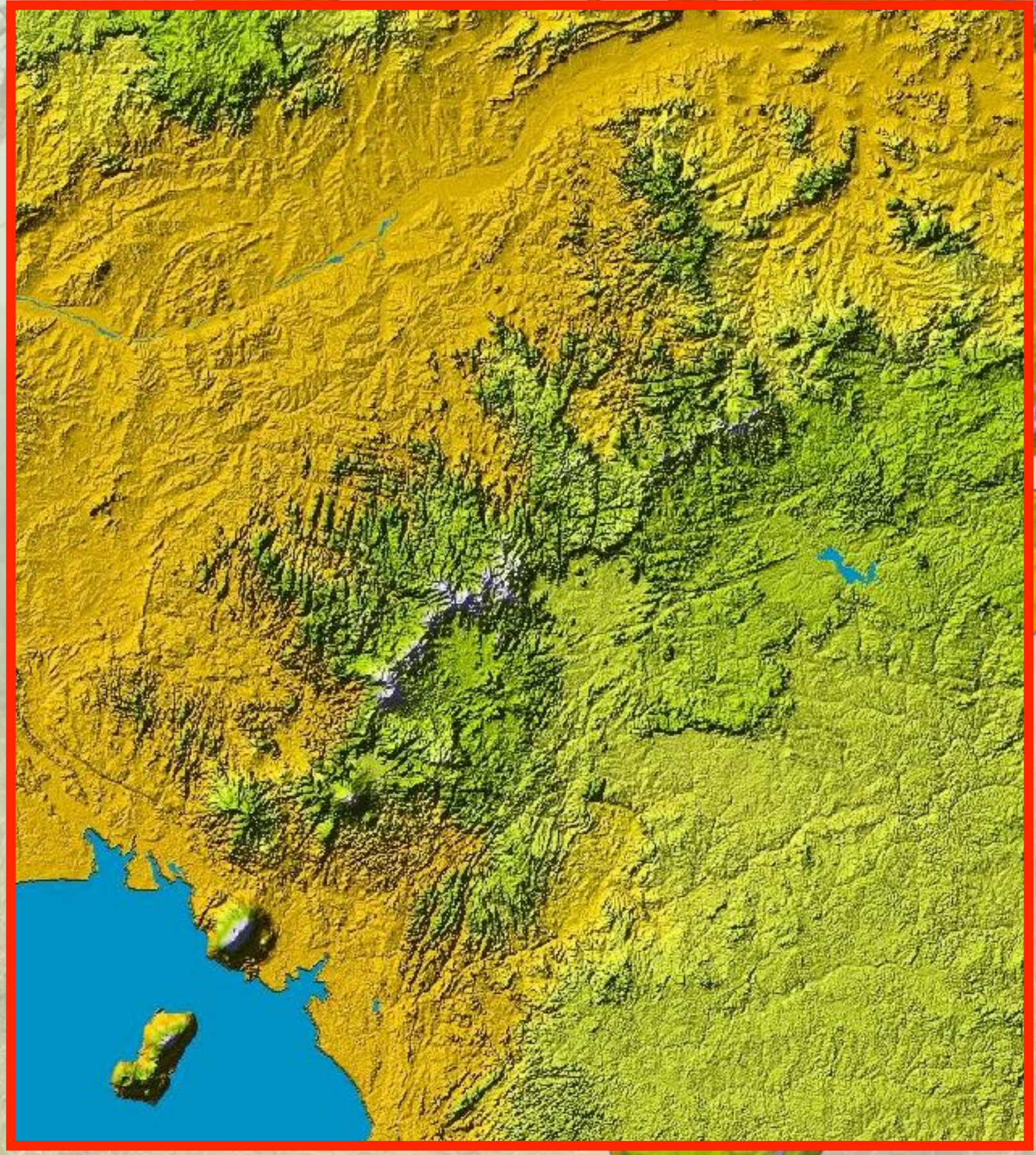
Part I: A model for the sociolinguistic structure of Benue-Congo communities

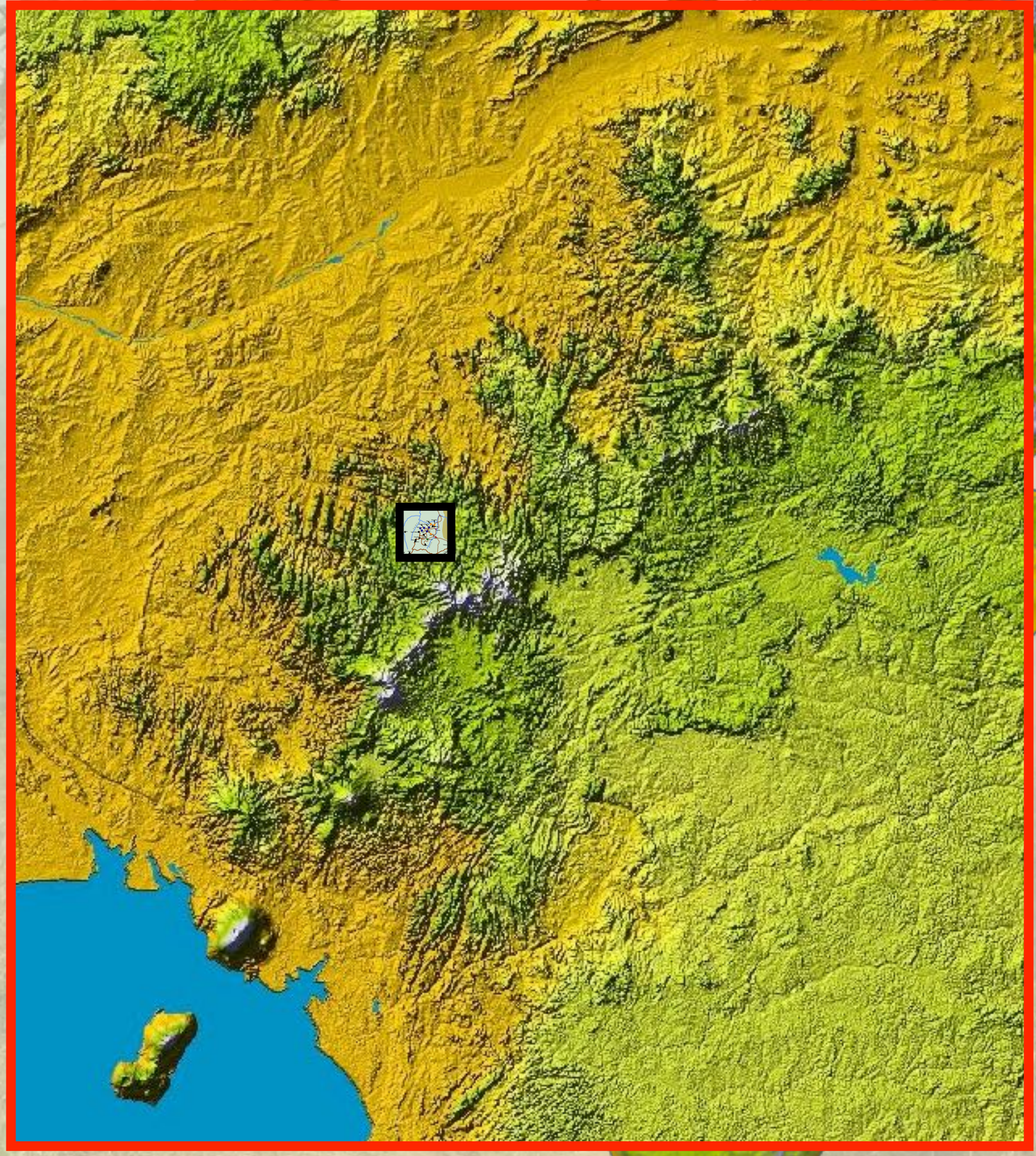
Part II: A first attempt at gathering large-scale data on lexical variation at the individual level

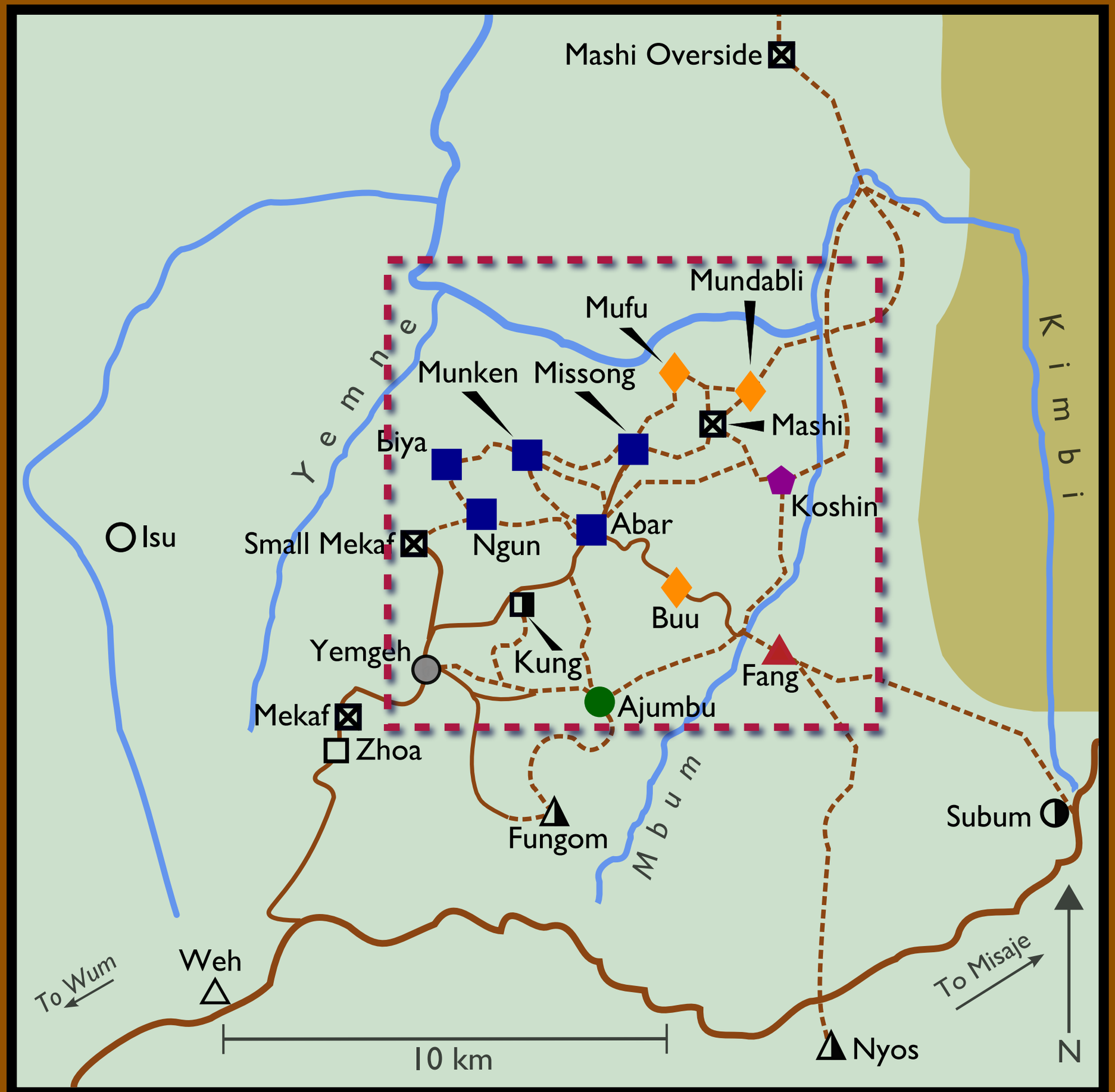
Lower Fungom

At the northern edge of the Grassfields









Lower Fungom

- 13 villages
- 7–9 "languages"
- 2 dialect clusters
- Bantoid subgroup
- 12,000(?) people
- Rural economy
- Localist attitudes
- Multilingualism/ multilectalism pervasive

Key sociolinguistic features

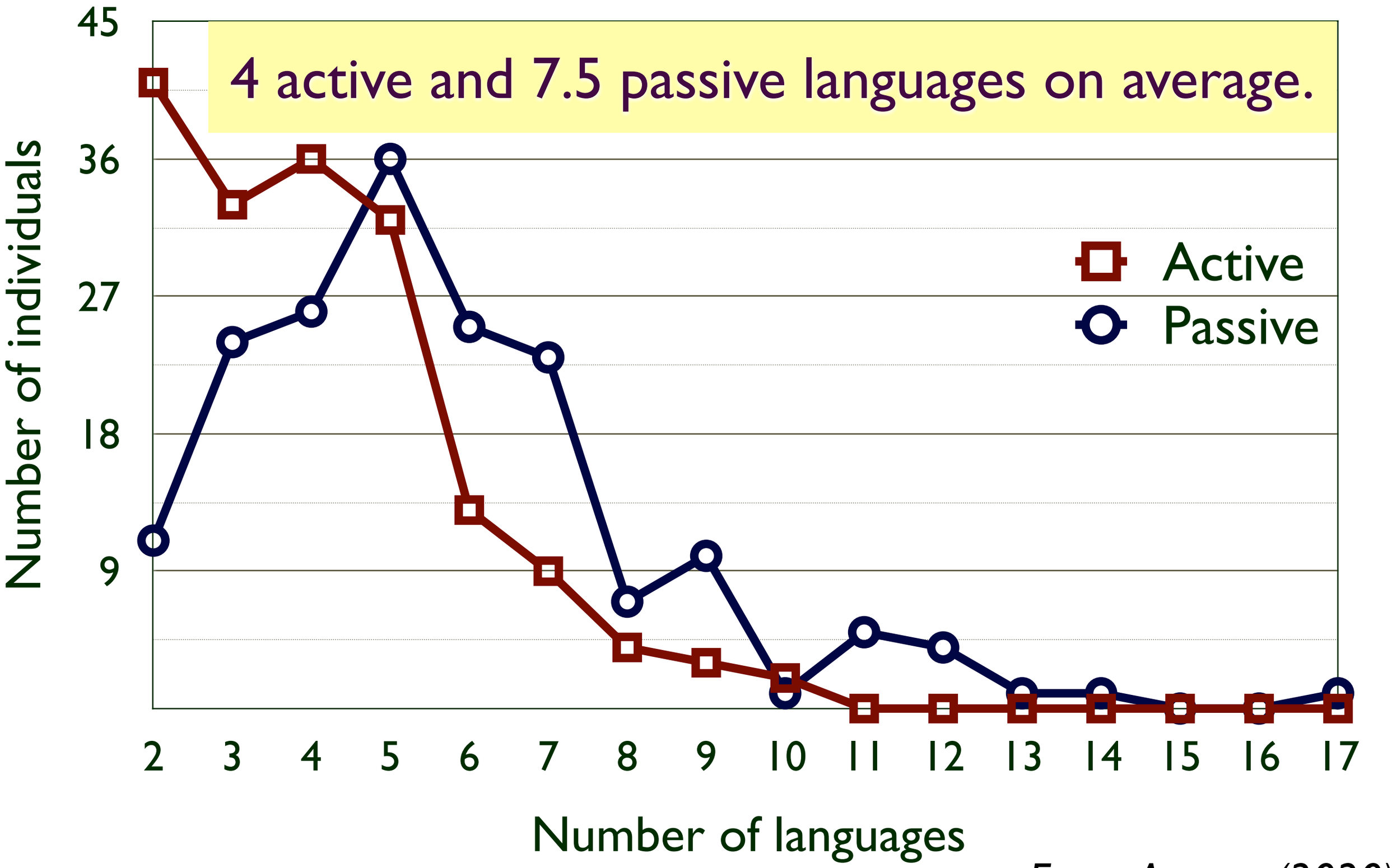
Extensive individual-level multilingualism and multilectalism

Linguistic differentiation linked to rapidly reconfigurable sociopolitical units

Patterns of use linked to maintenance of local relationships

- Taken together, these features
  - Challenge approaches that tie linguistic diversification to population dispersal
  - Suggest the need for better models of the historical sociolinguistics of Benue-Congo
  - Emphasize the importance of understanding patterns of linguistic knowledge and language use at the individual level, rather than the population level

Reported number of languages known (n = 174)



Esene Agwara (2020)

Linguistic differentiation and sociopolitical structures

[The sub-chief of Munken Down] wanted to split off from Munken, make Munken Down independent, and become its chief. But, you know, it was just a crazy plan. ***He didn't even have a separate language!*** *[laughs]*

–Kum Nixon, Munken [abar1238], 8 March 2010

Creating "Kumfutu"

- In the late 1980s and early 1990s, there was discontent in Kumfutu with Kuk leadership
- Some people from Kumfutu (elites and educated indviduals) founded a distinct Kumfutu Student Association
- By 2010, the different sides had reconciled

...then they told us: Well, if you want to be on your own, then change your dialect, so that everyone knows you are not from Kuk!

– CT, 26 May 2019

Examples of planned new vocabulary terms for Kumfutu

KUK	"KUMFUTU"	GLOSS
kə́bá	*kə́bál/kə́bán/kə́bánə́*	'fufu'
káŋ	*zə̀-kə́n-dzɔ̄ŋ*	'corn beer'
lə̀-m fə̀bə̂-m (white wine)	*ndzéí-sə̀ fə́bə́-sə́* (white urine)	'raffia wine'
káŋwàlə̀	*kə̀mà'lə̀*	'book'
nə̂:	*nô:*	'mother'
wāī	*wéí*	'child'
bə́kə́wə́n	*bə́kə́wɛ́í*	'market'
á ŋwô	*á nwô*	'let's go'
wu (singular)	*gha* (plural)	'you (in greetings)'
bei	*bilə*	'sleep (in greetings)'

Data collected by Nelson Tschonghongei

N: *A kɛ ya lɛ dzɛŋ?*
Did you come up to Fang?

Ɗ wu yɛ bu ka follow wa ton.
I heard that you were chased there.

B: *Ɗ ka follow be mi?*
Chased away?

Ɗge du ye a ka de mi. E bɛ kɛhɛ Manto.
It was not me, it was Manto

N: *A ke wou ye kem jo uwa de?*
Are you all listening to what I am saying?

B = 45 year old man
Father from Missong
Mother from Buu

N = 60 year old man
From Buu

Buu in italics
Missong in bold

Code regimentation in Lower Fungom (see Ojong 2020)

B = 45 year old man
Father from Missong
Mother from Buu

N = 60 year old man
From Buu

Buu in italics
Missong in bold

B: *Ben wou gin ta?*
What should we listen to?

N: *A gɛ kɛ kɛ ta?*
So, where did you go?

B: *Offlicense* **wo ne mi wo me ma bahɛ ti ma.**
I reached here and saw you in this off-license.

N: *Bi kie lahɛ.*
You are still a child.

[After some grumbling, N stops speaking to B, who then leaves.]

Code regimentation in Lower Fungom (see Ojong 2020)

Mayok: Messié cheri, bonsoir! ***How nɔ cheri!***
"My dear sir/Messié, good evening! [French] How are you, dear? [Camfranglais]"

Messié: ça va ma cherie
"I'm fine, my dear [French]"

Mayok: [to Ntui] **longtime nɔ see! how you loss so?** *βɛ́lɛ́ɛ́ ka ká ywé ámɨŋé ká nnɨ̀k mwɛ́t ɔ kɛ ka yí á dɨŋɛ́ mɛ́*
"[to Ntui] It has been long since we saw one another, I hope all is well with you? [CPE] Don't betray my character to Messié [Ejagham], please, don't let him know me [Kenyang]."

Ntui: *ɔ kɛ́ dɛ́n mwɛ́t, ʧɔ̀ŋ ŋ́ kwuti wɔ* as usual *ɔ fòntí má áfón, ɔ fɨŋ ntí ma ákám* **me and you deh boh**
"You don't have to be worried, I will protect you [Kenyang] as usual [English]. You and I [CPE] are birds of a feather [literally, 'We both have many things in common in life'] so there is need to shield our poor behavior in public and in particular to strangers [Ejagham]."

Code mixing in Ossing
(Tabe 2020)

Language key
Kenyang
Ejagham
French
Cameroon Pidgin English
Camfranglais

Expanding our knowledge of individual-level variation

Individual-based word lists

- Based on methods first developed by Angela Nsen Tem (see Mba & Nsen Tem 2020)
- Wordlists collected by Nelson Ts. Tsonghongei in individual sessions, without standardization/harmonization
- More than 15,000 entries currently across 44 speakers
- Customized concept list due to emphasis on synchronic patterns of variation, rather than genealogical connections
- Detailed sociolinguistic information collected for each speaker

Window into variation

- Individual-based wordlists are a data source on variation that can be collected relatively easily
- Questions that we are able to consider at this stage
  - What level of individual-level lexical variation is present?
  - Do some varieties show more individual-level variation than others?
  - Do some concepts show more variation than others?
  - What are the overall patterns of lexical similarity and contact across Lower Fungom varieties and how clear-cut are "language" boundaries?
- Questions for future work
  - How do individual-level linguistic repertoires impact variation?
  - How does "L1" lexical variation compare to "L2" lexical variation?

Wordlist analysis

- Merger of wordlists based on two versions of concept lists
- Processed using CLDFBench toolkit (Forkel & List 2020) for cleaning and IPA mapping
- LingPy (List et al. 2018) was used for further analysis
- LingPy was developed for historical linguistic analysis
- Adapted approach for Hantgan & List (to appear)

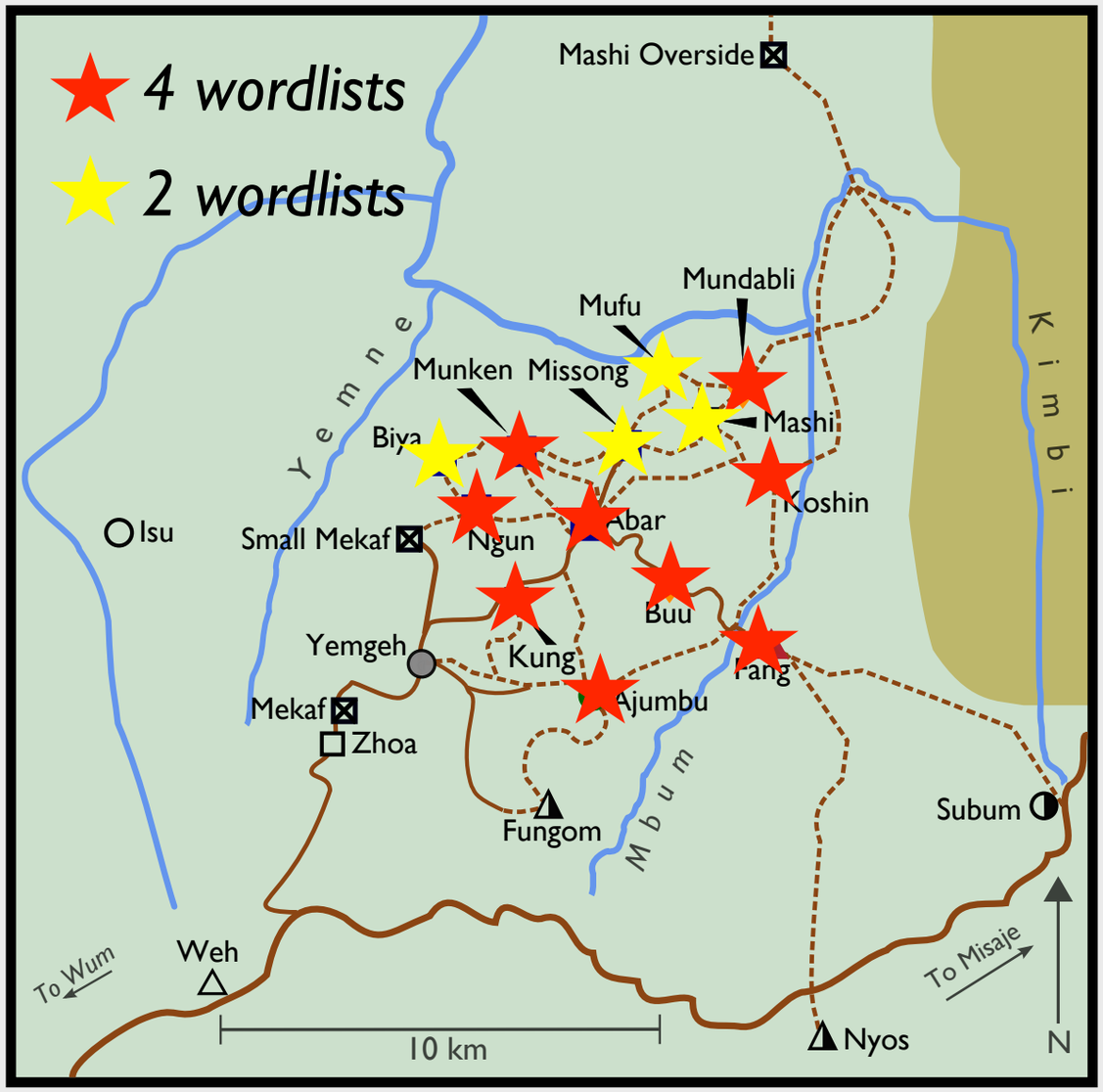
k	ə	5	-	tʷ	-	aɪ	5	-	m	ə	1
k	ə	1	-	t	-	uɪ	1	-	m	-	-
-	-	-	-	t	-	øɪ	5	-	m	ə	5
k	ə	1	-	t	w	aɪ	1	-	m	ə	1
-	-	-	-	t	w	o	3	-	m	-	-
k	ə	1	n	t	-	ɔ	3	-	m	-	-
k	ə	1	-	t	-	o	3	-	m	-	-
k	ə	1	-	tʷ	-	o	3	-	m	-	-
-	a	1	n	t	-	ʊ	3	-	m	-	-
-	n	1	-	t	-	ʊ	3	-	m	-	-
-	-	-	-	t	w	oɪ	1	-	m	-	-
k	ə	1	-	t	-	oɪ	1	5	m	-	-
-	-	-	-	tʷ	-	o	3	-	m	-	-
k	ə	1	-	t	-	ʊ	3	-	m	-	-
-	a	1	n	t	-	ʊ	3	-	m	-	-
k	ə	1	-	t	-	o	3	-	m	-	-
k	ə	1	n	t	-	ĩɪ	1	-	k	ə	1
-	a	1	n	t	-	ʊ	3	-	m	-	-
k	ə	1	n	t	-	ɔ	3	-	m	-	-

Lexical similarity sets

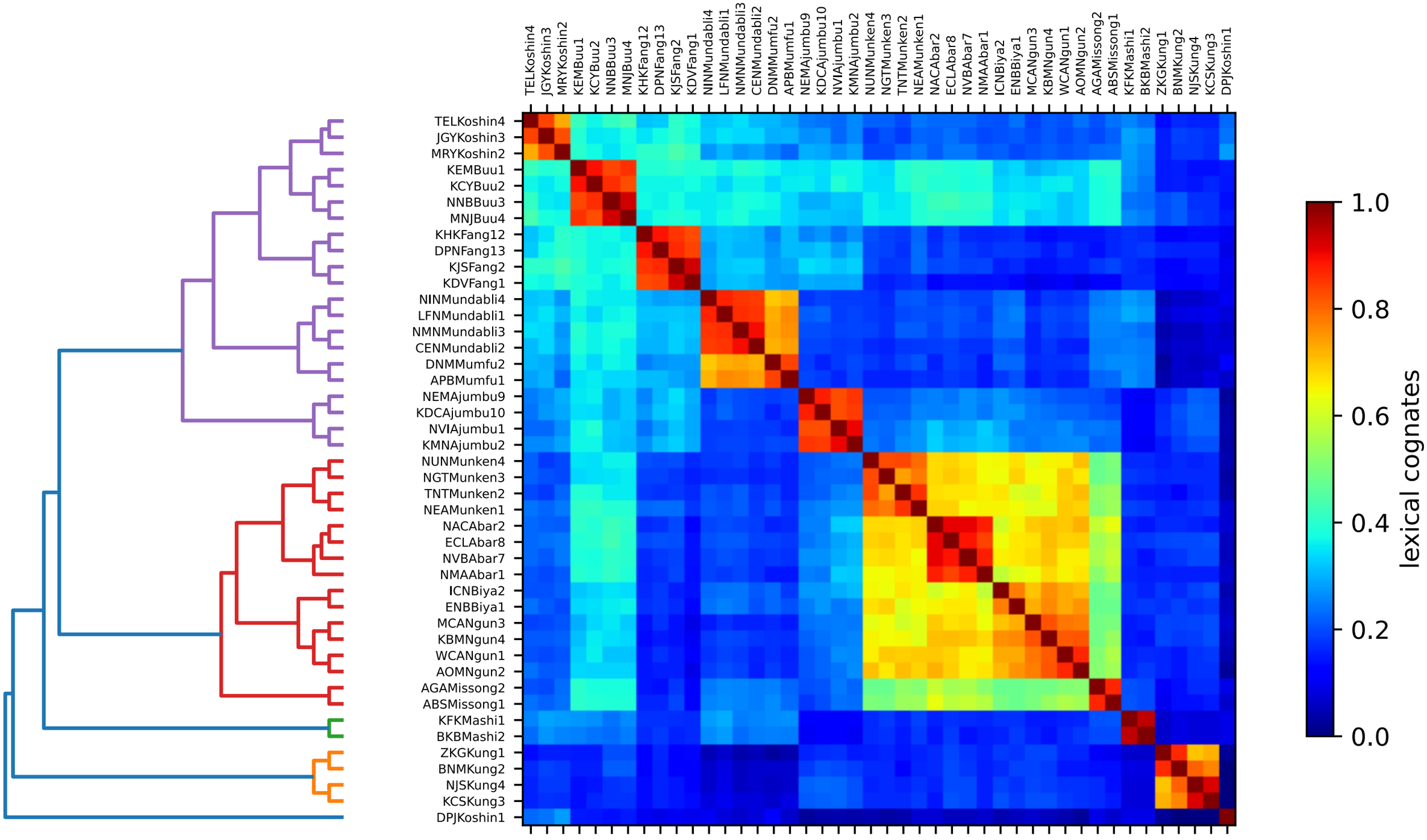
- LingPy is designed to detect cognates in lexical data
- It is used here to detect "similarity sets" of forms, which will generally also be historical cognates
- This seems to be a new use for automated cognate detection tools for synchronic sociolinguistic analysis
- We adopted a "shallow" approach to comparison, but it is not clear yet how best to adapt them for synchronic work

Data overview

- 44 words lists
  - 4 for 9 of the varieties and
  - 2 for the remaining 4 varieties
- Collected in two phases, with some changes to the concept list
- Around 5500 words involved in results presented here
- These are associated with concepts with good coverage



44 Lower Fungom wordlists, concepts with 75% coverage
LingPy Sound-Class-Based Phonetic Alignment (SCA)



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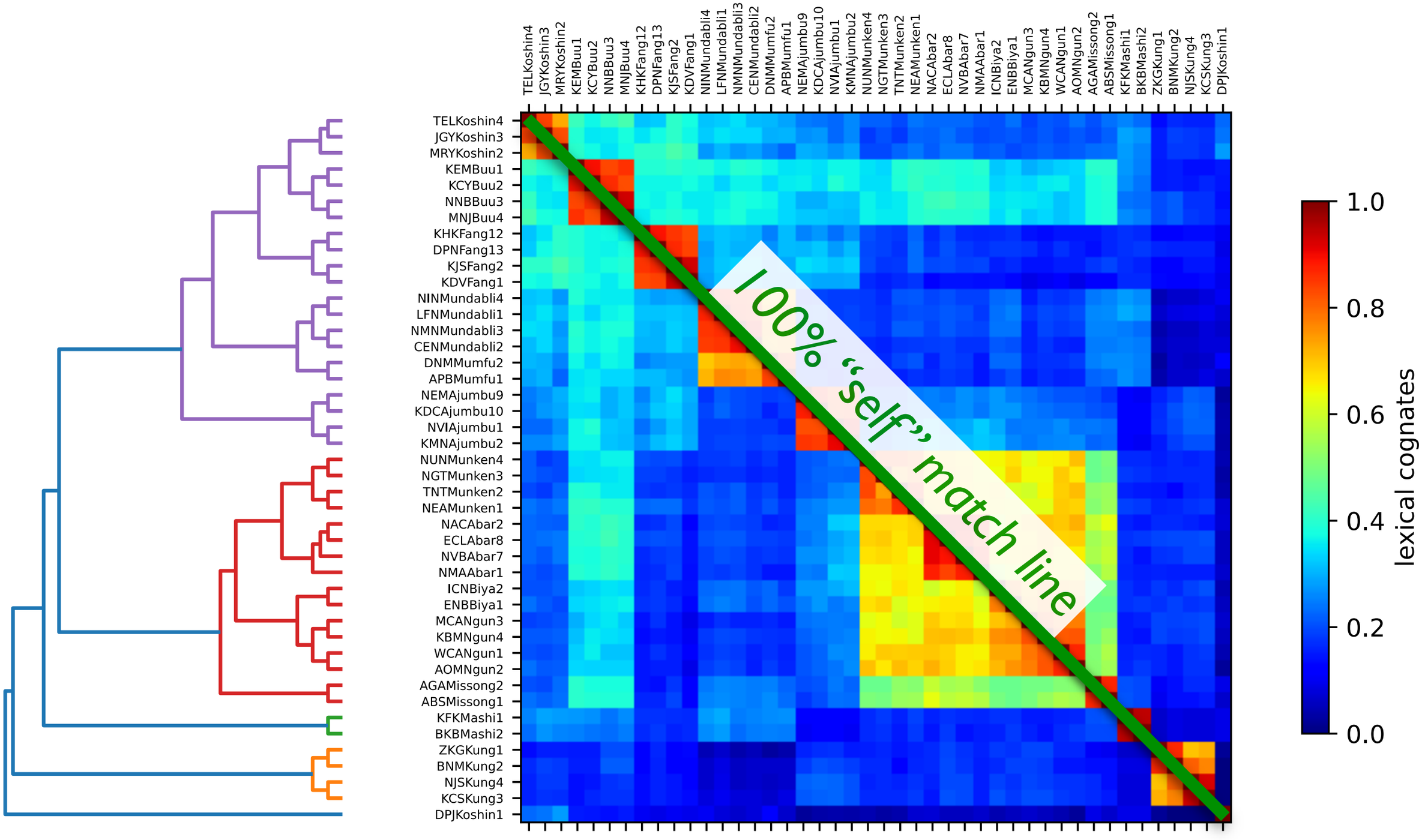

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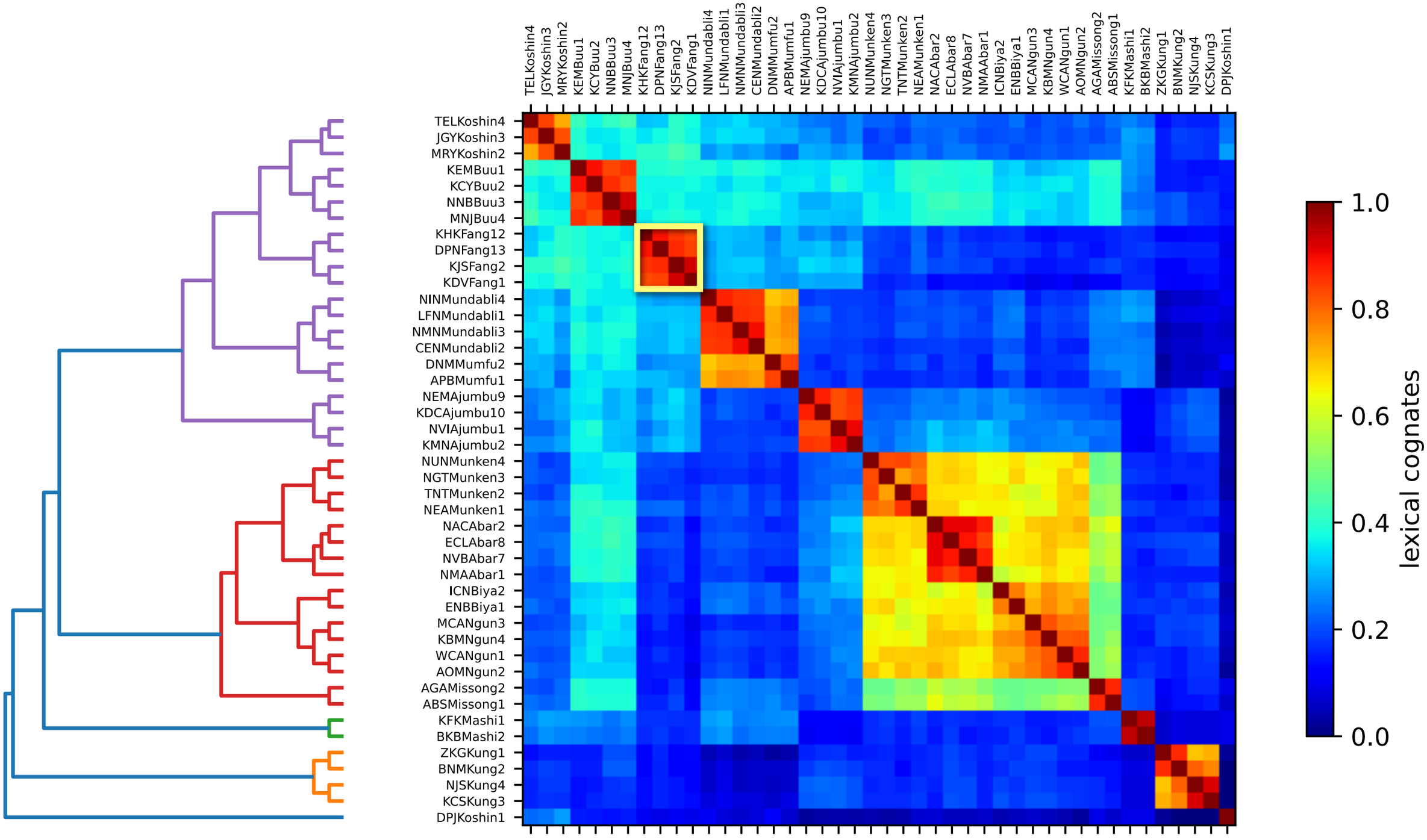
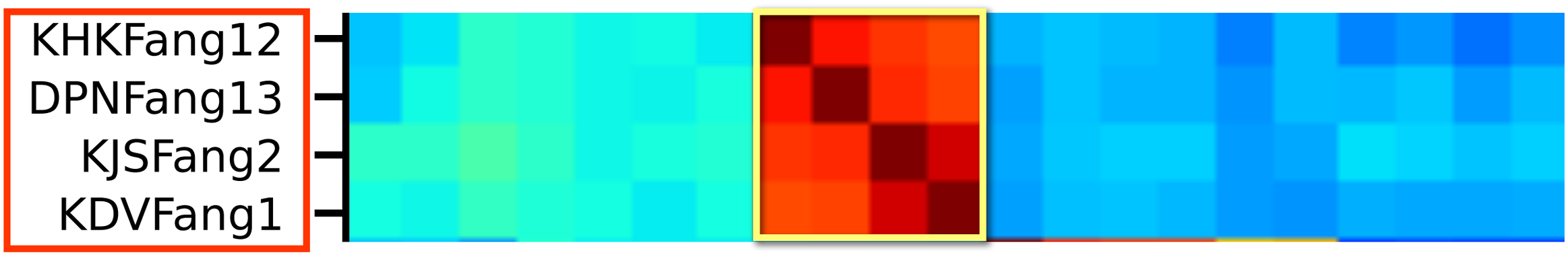


Similarity sub-matrix for four individual-based wordlists collected on the Fang variety



Individual doculects

Speaker Initials
Variety Name
ID number

While there is variation,
Fang is very visible in the heat map.

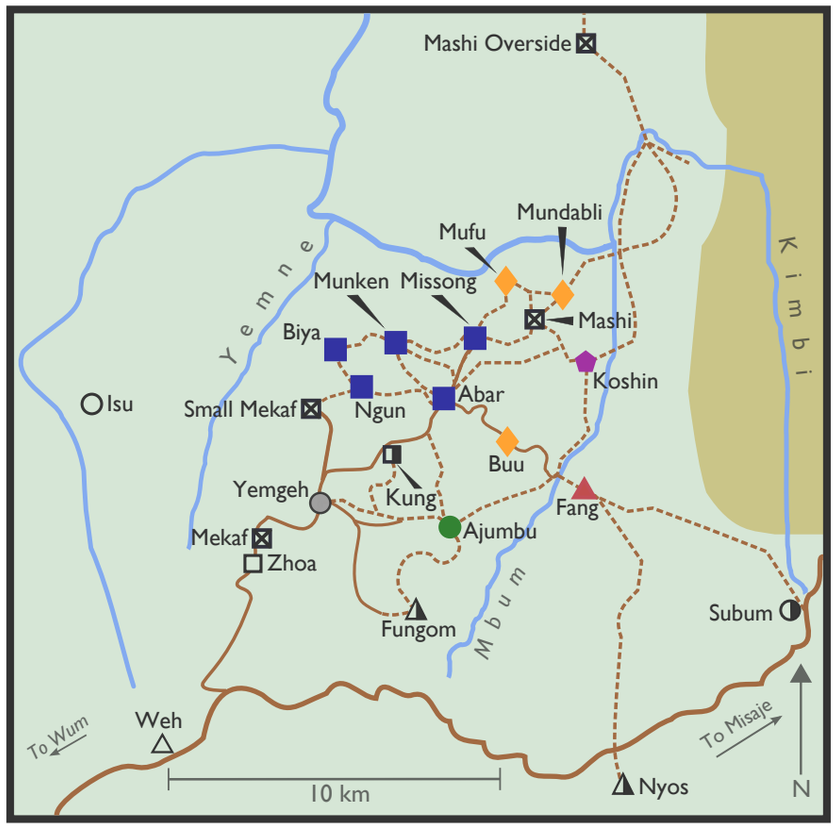
Calculated distances for Fang varieties

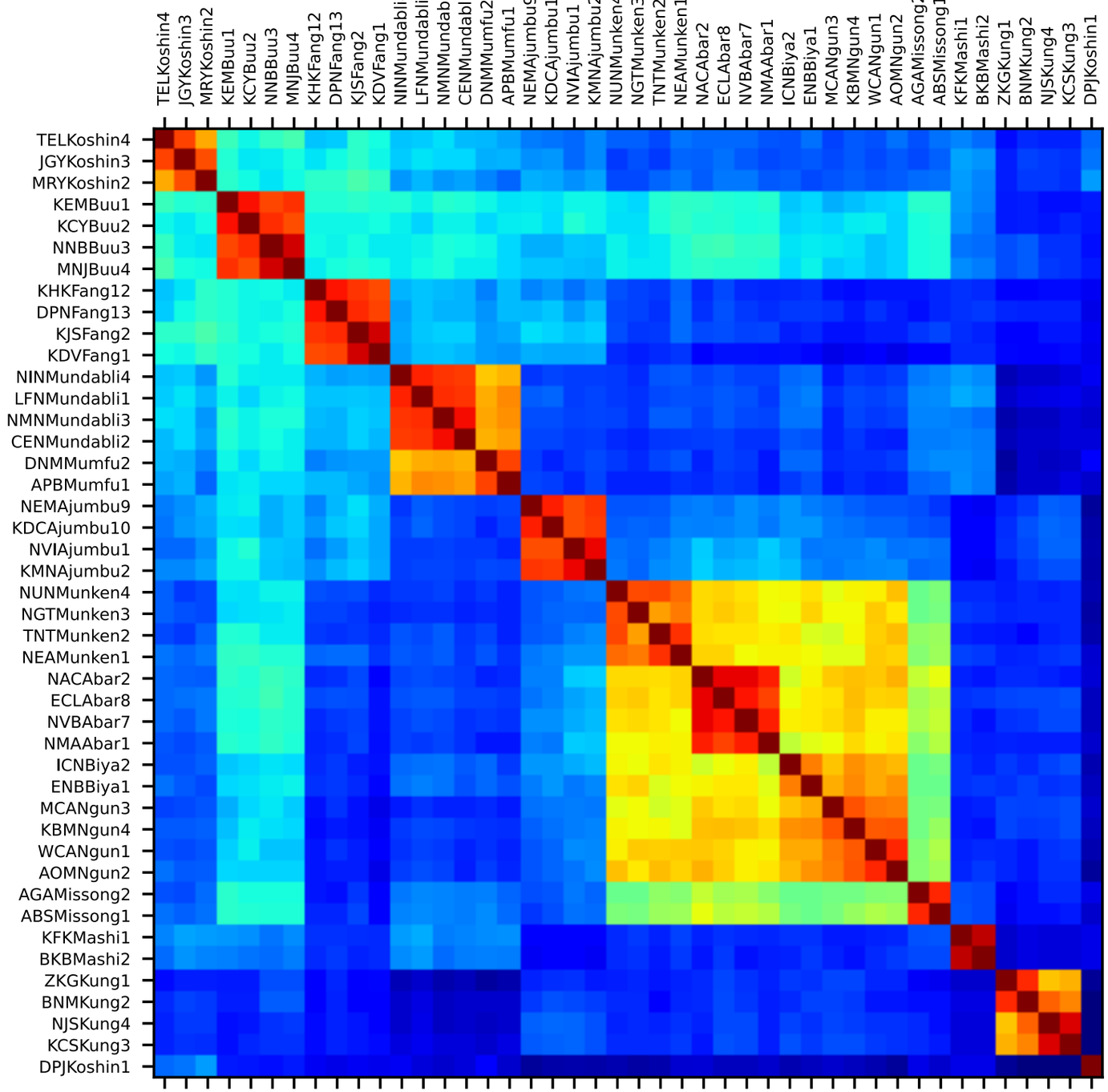
KHKFang12	1.00	0.90	0.87	0.84
DPNFang13	0.90	1.00	0.88	0.85
KJSFang2	0.87	0.88	1.00	0.93
KDVFang1	0.84	0.85	0.93	1.00

Concept: *1044_pot* (ID: 7)			
CogID	**Language**	**Entry**	**Aligned Entry**
165	BNMKung2	tɔ^{1}ɪ^{1}	t ɔ 1 ɪ 1
165	KCSKung3	tɔ^{1}j	t ɔ 1 j -
165	NJSKung4	tɔ^{1}ɪ^{1}	t ɔ 1 ɪ 1
165	ZKGKung1	tɔ^{1}ɪ^{1}	t ɔ 1 ɪ 1
168	DPJKoshin1	wə^{5}n	w ə 5 n - - - - - -
168	KBMNgun4	fi^{1}nsʊː^{1}	f i 1 n s ʊː 1 - - -
168	KMNAjumbu2	fə^{1}ŋkʊː^{1}	f ə 1 ŋ k ʊː 1 - - -
168	NVIAjumbu1	fə^{1}ŋkoː^{1}	f ə 1 ŋ k oː 1 - - -
168	WCANgun1	fi^{1}nsʊː^{51}ʊ^{5}	f i 1 n s ʊː 5 1 ʊ 5
169	DPNFang13	ʃ^{j}ø^{3}	ʃʲ ø 3 -
169	KDVFang1	ʃu^{53}	ʃ u 5 3
169	KHKFang12	ʃʉː^{53}	ʃ ʉː 5 3
169	KJSFang2	ʃu^{53}	ʃ u 5 3
172	ICNBiya2	nti^{5}sə^{5}	--
176	KCYBuu2	pje^{51}sə^{1}	p j e 5 1 s ə 1
176	KEMBuu1	pje^{51}sə^{1}	p j e 5 1 s ə 1
176	MNJBuu4	pje^{51}sə^{1}	p j e 5 1 s ə 1
176	NNBBuu3	pje^{51}sə^{1}	p j e 5 1 s ə 1
177	KDCAjumbu10	nko^{1}	- - n k - o 1 - - -
177	NEAMunken1	ŋk^{x}jə^{1}hə^{1}	- - ŋ kˣ j ə 1 h ə 1
177	NEMAjumbu9	nko^{1}	- - n k - o 1 - - -
177	NGTMunken3	ŋ^{1}k^{j}ɛ^{1}hɛ^{1}	ŋ 1 - kʲ - ɛ 1 h ɛ 1
177	NUNMunken4	ŋ^{1}kɛ^{1}hɛ^{1}	ŋ 1 - k - ɛ 1 h ɛ 1
177	TNTMunken2	ŋkjə^{1}sə^{1}	- - ŋ k j ə 1 s ə 1

Concept: *1306_stomach* (ID: 28)			
CogID	**Language**	**Entry**	**Aligned Entry**
661	DPNFang13	tʊː¹mə⁵	- - - - t - ʊː 1 - m ə 5
661	KDCAjumbu10	kə⁵tʷaː⁵mə¹	k ə 5 - tʷ - aː 5 - m ə 1
661	KEMBuu1	kə¹tuː¹m	k ə 1 - t - uː 1 - m - -
661	KHKFang12	tøː⁵mə⁵	- - - - t - øː 5 - m ə 5
661	KMNAjumbu2	kə¹twaː¹mə¹	k ə 1 - t w aː 1 - m ə 1
661	LFNMundabli1	two³m	- - - - t w o 3 - m - -
661	MCANgun3	kə¹ntɔ³m	k ə 1 n t - ɔ 3 - m - -
661	MNJBuu4	kə¹to³m	k ə 1 - t - o 3 - m - -
661	NACAbar2	kə¹tʷo³m	k ə 1 - tʷ - o 3 - m - -
661	NEAMunken1	a¹ntʊ³m	- a 1 n t - ʊ 3 - m - -
661	NGTMunken3	n¹tʊ³m	- n 1 - t - ʊ 3 - m - -
661	NINMundabli4	twoː¹m	- - - - t w oː 1 - m - -
661	NJSKung4	kə¹toː¹⁵m	k ə 1 - t - oː 1 5 m - -
661	NMNMundabli3	tʷo³m	- - - - tʷ - o 3 - m - -
661	NNBBuu3	kə¹tʊ³m	k ə 1 - t - ʊ 3 - m - -
661	NUNMunken4	a¹ntʊ³m	- a 1 n t - ʊ 3 - m - -
661	NVBAbar7	kə¹to³m	k ə 1 - t - o 3 - m - -
661	TELKoshin4	kə¹ntɪ̃ː¹kə¹	k ə 1 n t - ɪ̃ː 1 - k ə 1
661	TNTMunken2	a¹ntʊ³m	- a 1 n t - ʊ 3 - m - -
661	WCANgun1	kə¹ntɔ³m	k ə 1 n t - ɔ 3 - m - -
668	KDVFang1	ŋkʊ¹⁵m	ŋ k ʊ 1 5 m
668	KJSFang2	ŋkʊ¹⁵m	ŋ k ʊ 1 5 m
677	MRYKoshin2	kwə⁵	--
684	NMAAbar1	a⁵mbi⁵	--
689	NVIAjumbu1	kə⁵zo⁵¹	--
693	ZKGKung1	nɛː⁵¹	--

44 wordlists, concepts with 75% (33/44 wordlosts) coverage
LingPy Sound-Class-Based Phonetic Alignment (SCA)





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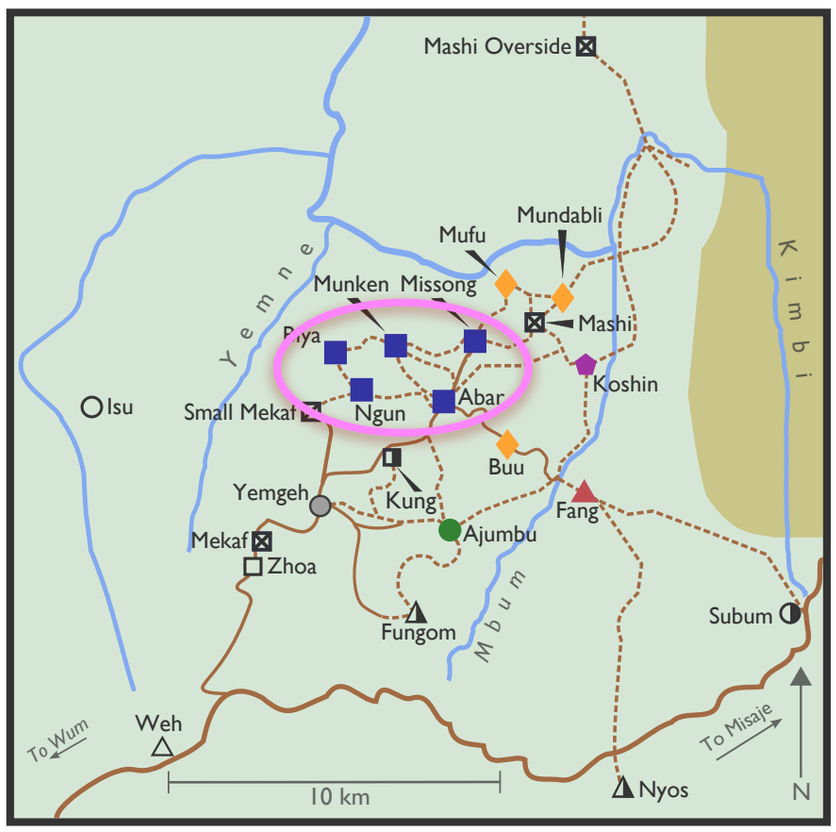
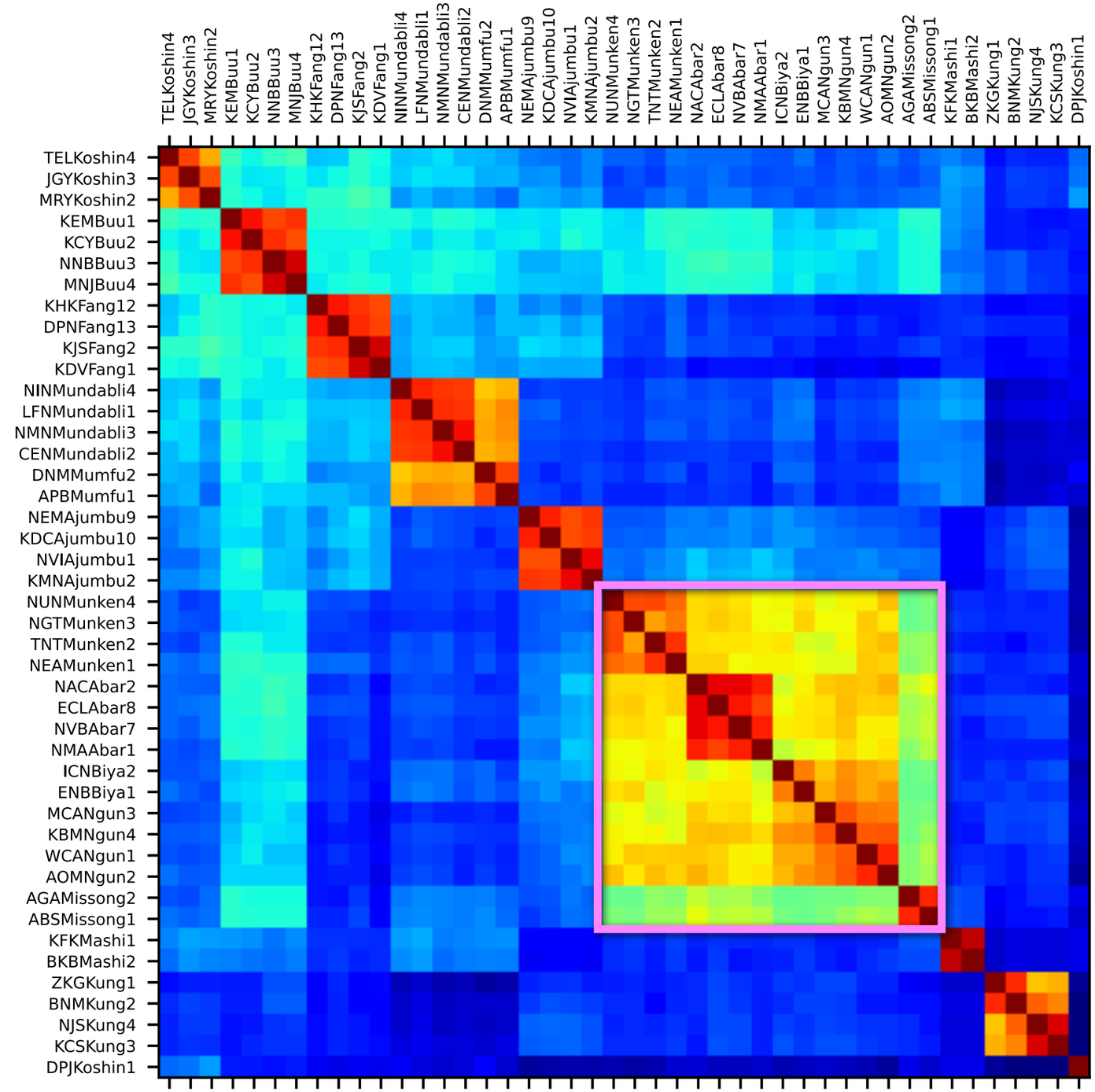
Mungbam cluster





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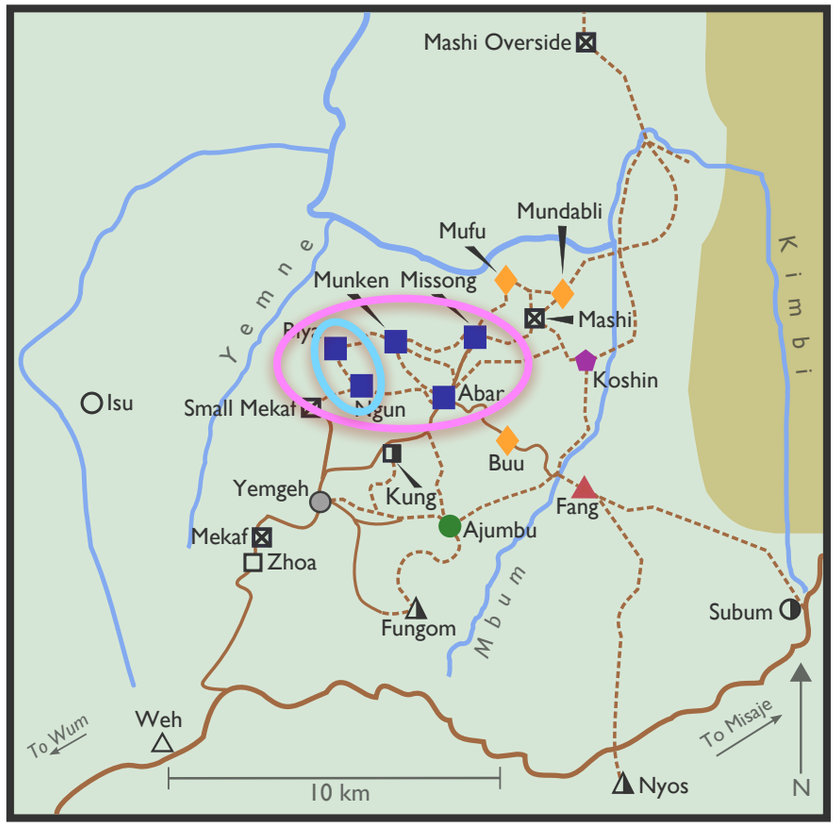
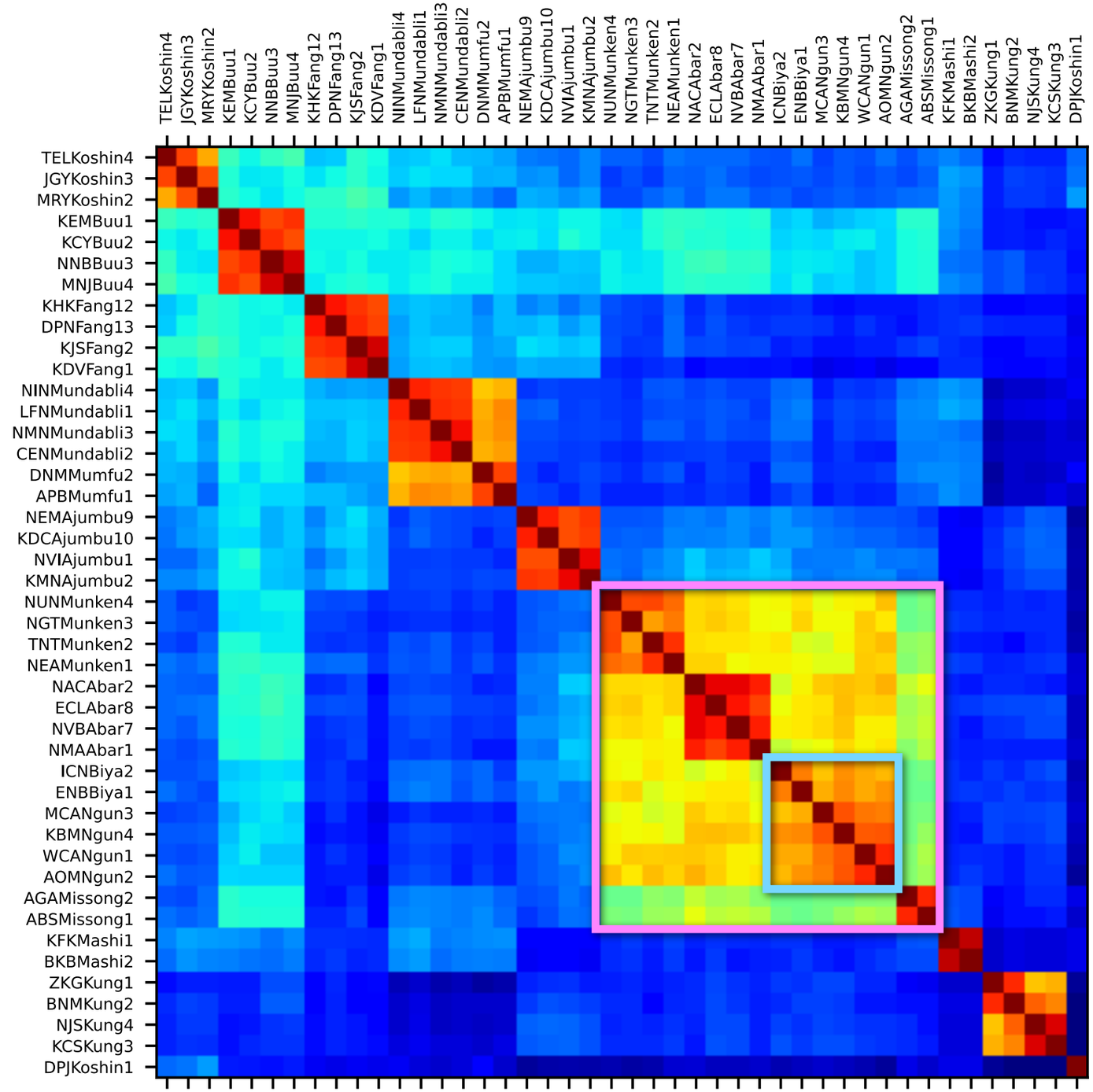
Mungbam cluster

Biya–Ngun subcluster





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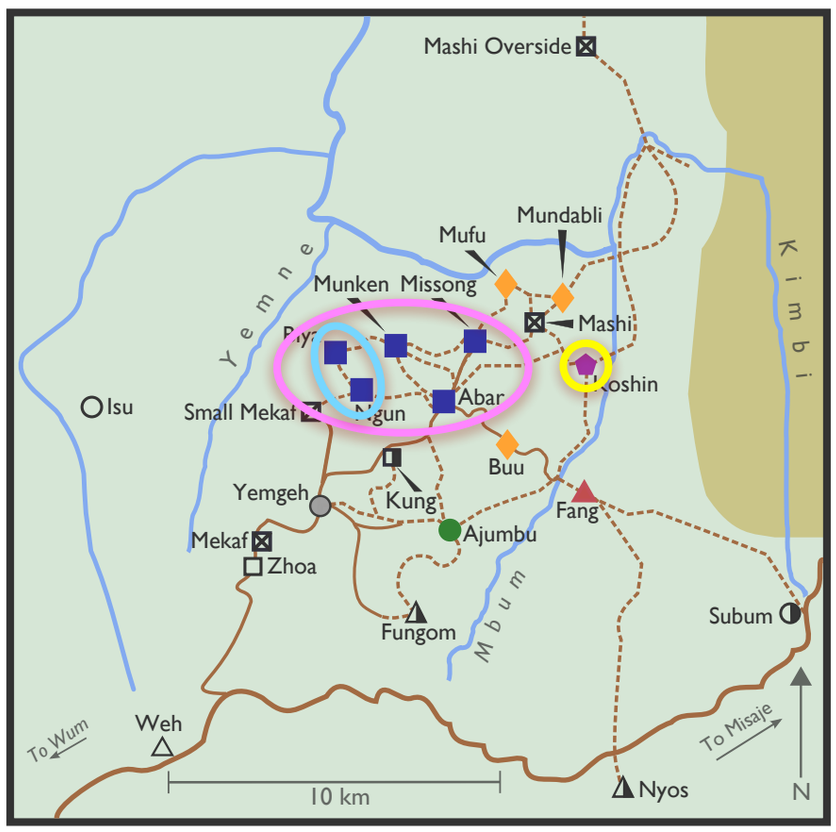
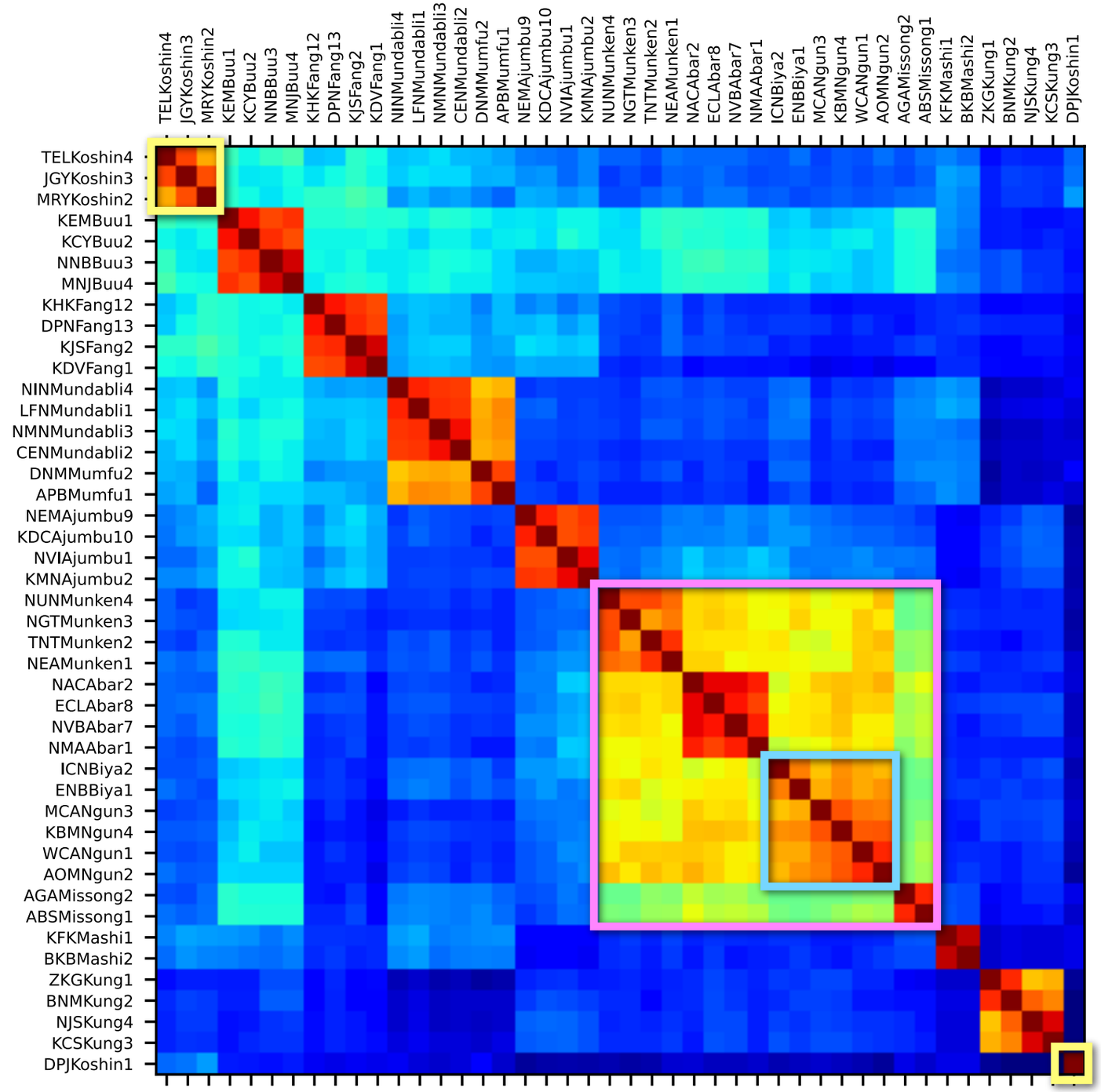
Mungbam cluster

Biya–Ngun subcluster

Koshin lexical outlier





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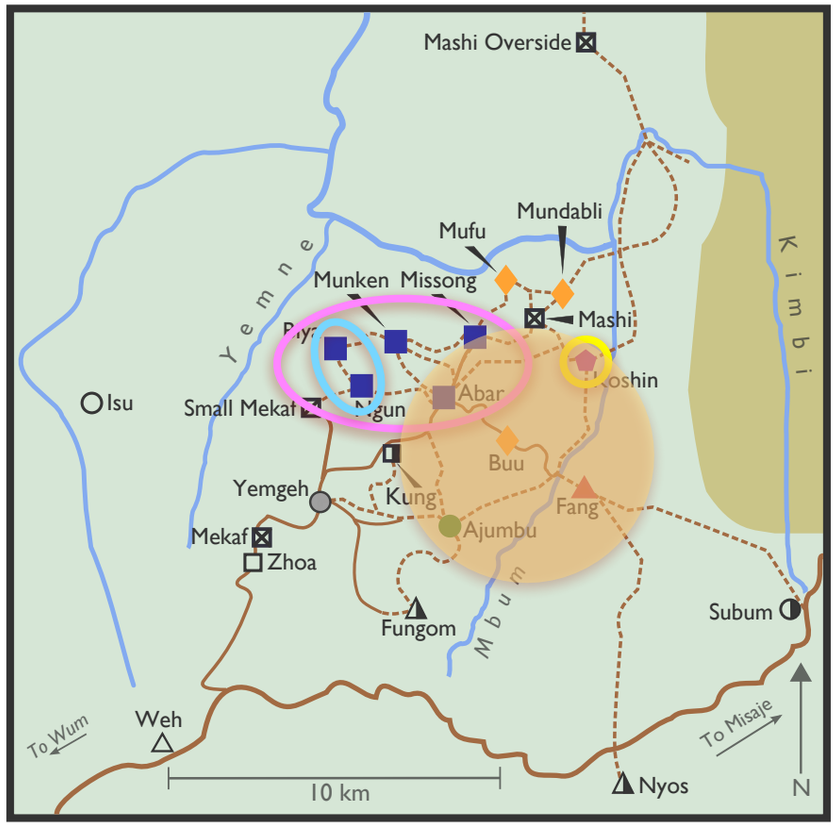
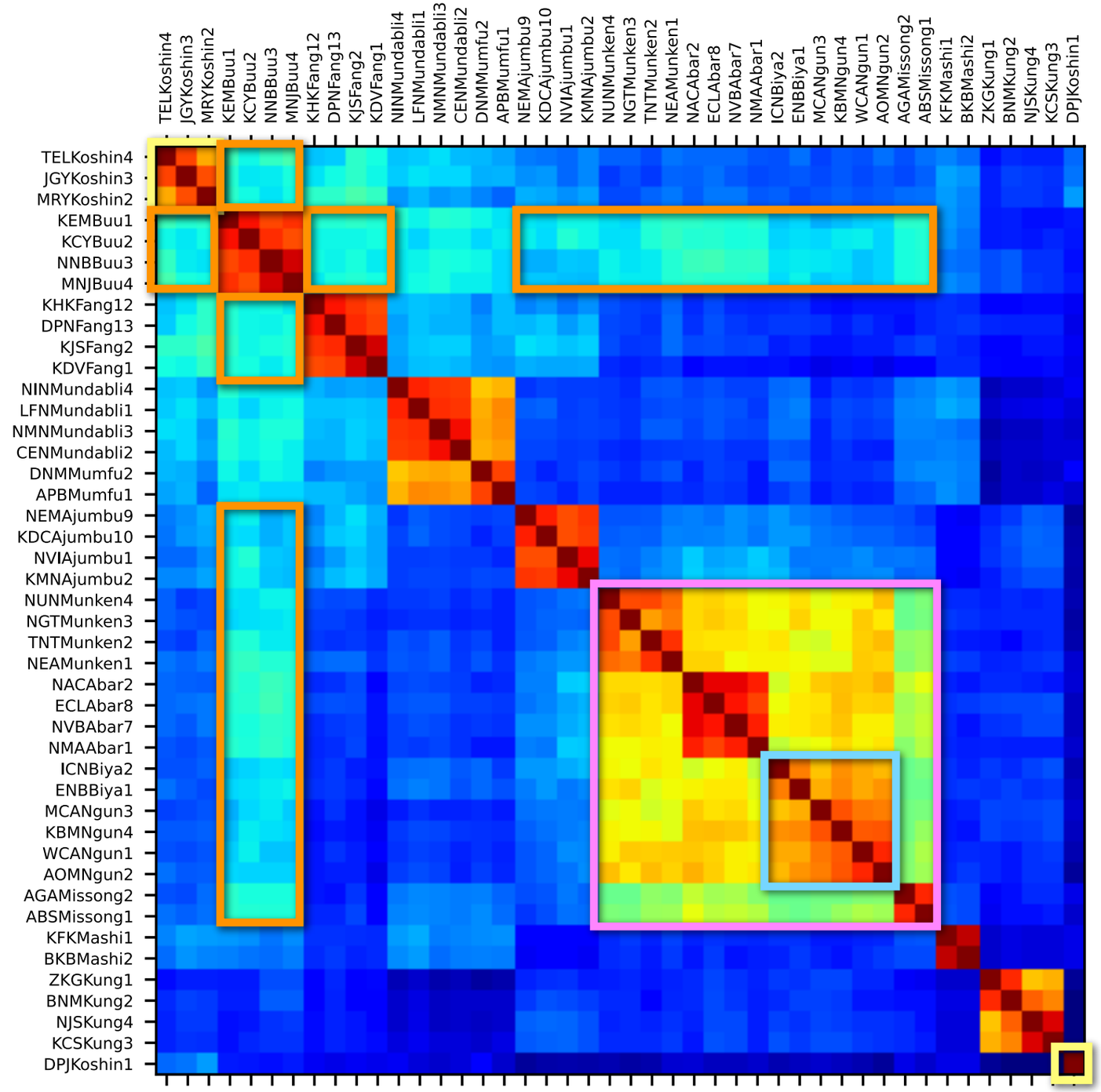
Mungbam cluster

Biya–Ngun subcluster

Koshin lexical outlier

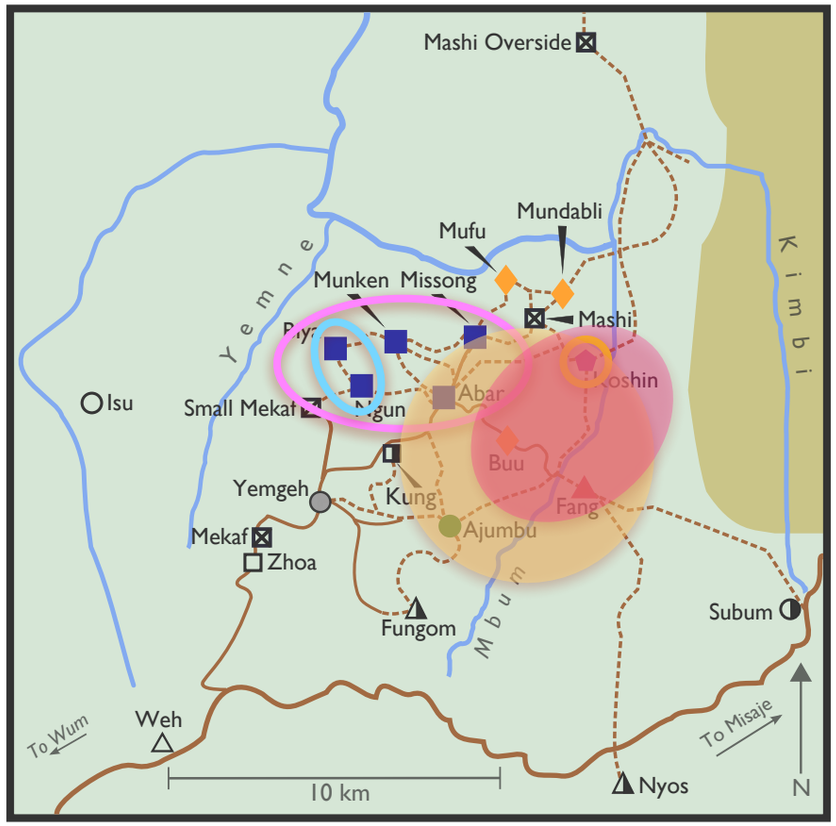
Buu contact relationships?

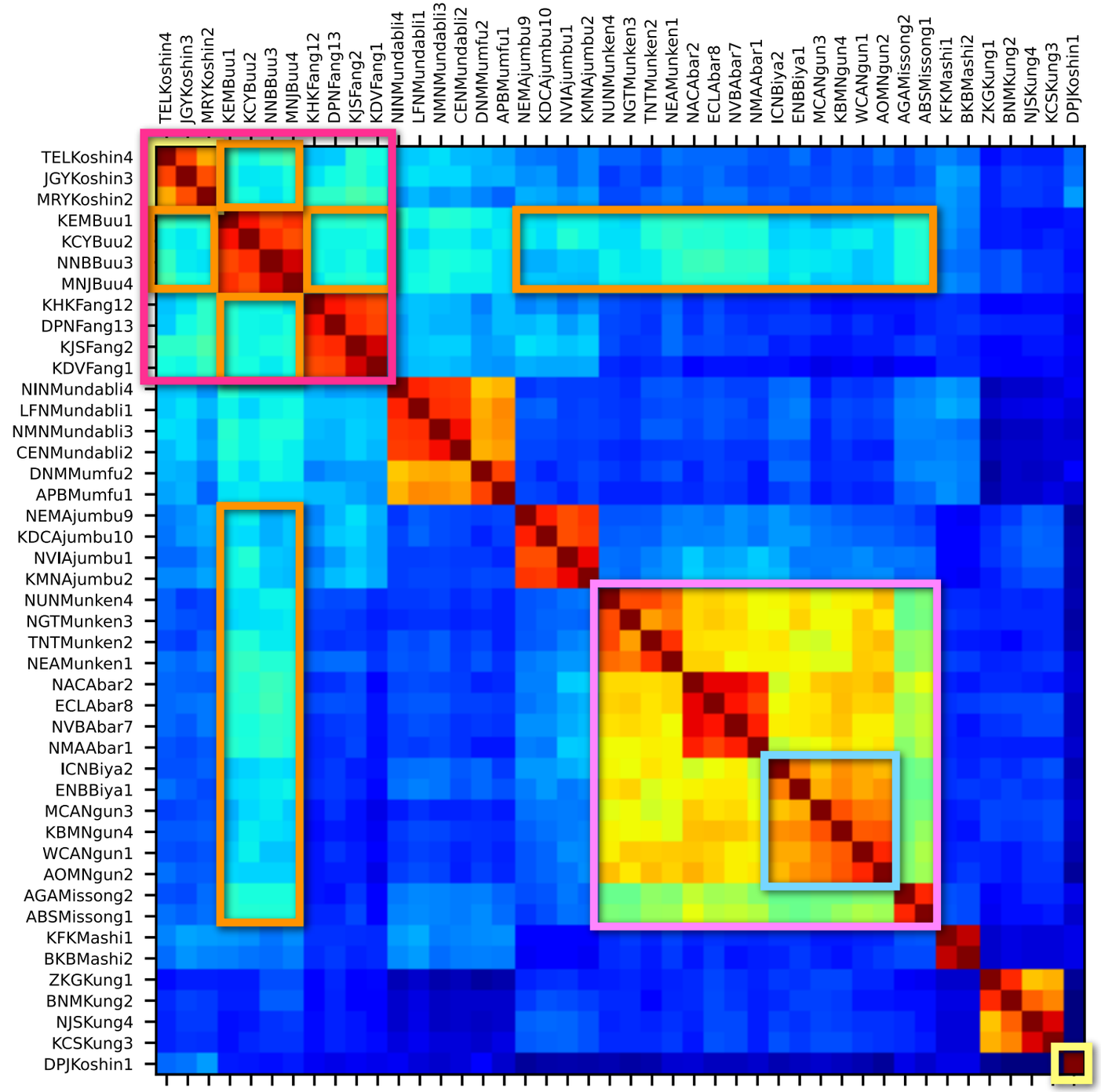




44 wordlists, concepts with 75% (33/44 wordlosts) coverage
LingPy Sound-Class-Based Phonetic Alignment (SCA)

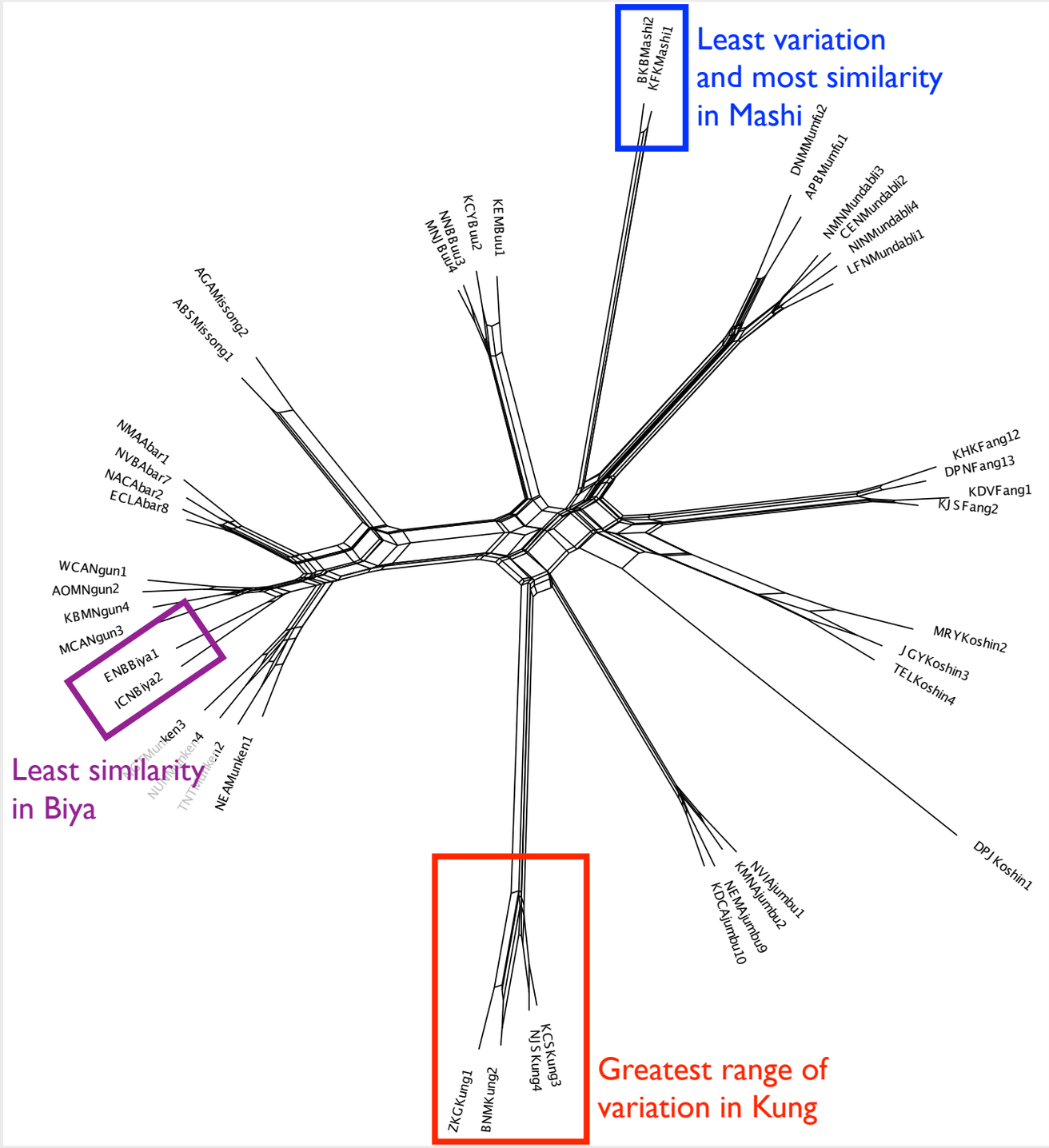
- Mungbam cluster
- Biya–Ngun subcluster
- Koshin lexical outlier
- Buu contact relationships?
- Southeastern contact area?





Patterns of individual variation

- Similarity within a variety
  Excludes outlier wordlist DPJKoshin1
  - Maximum: 0.95 (Mashi)
  - Minimum: 0.79 (Biya)
  - Average: 0.85
- Range of variation in a variety
  - Maximum: 0.27 (Kung)
  - Minimum: 0.05 (Mashi)
  - Average: 0.17
- Variation across Biya and Ngun similar to variation within Kung
- We are not aware of a "baseline" comparison to assess the results



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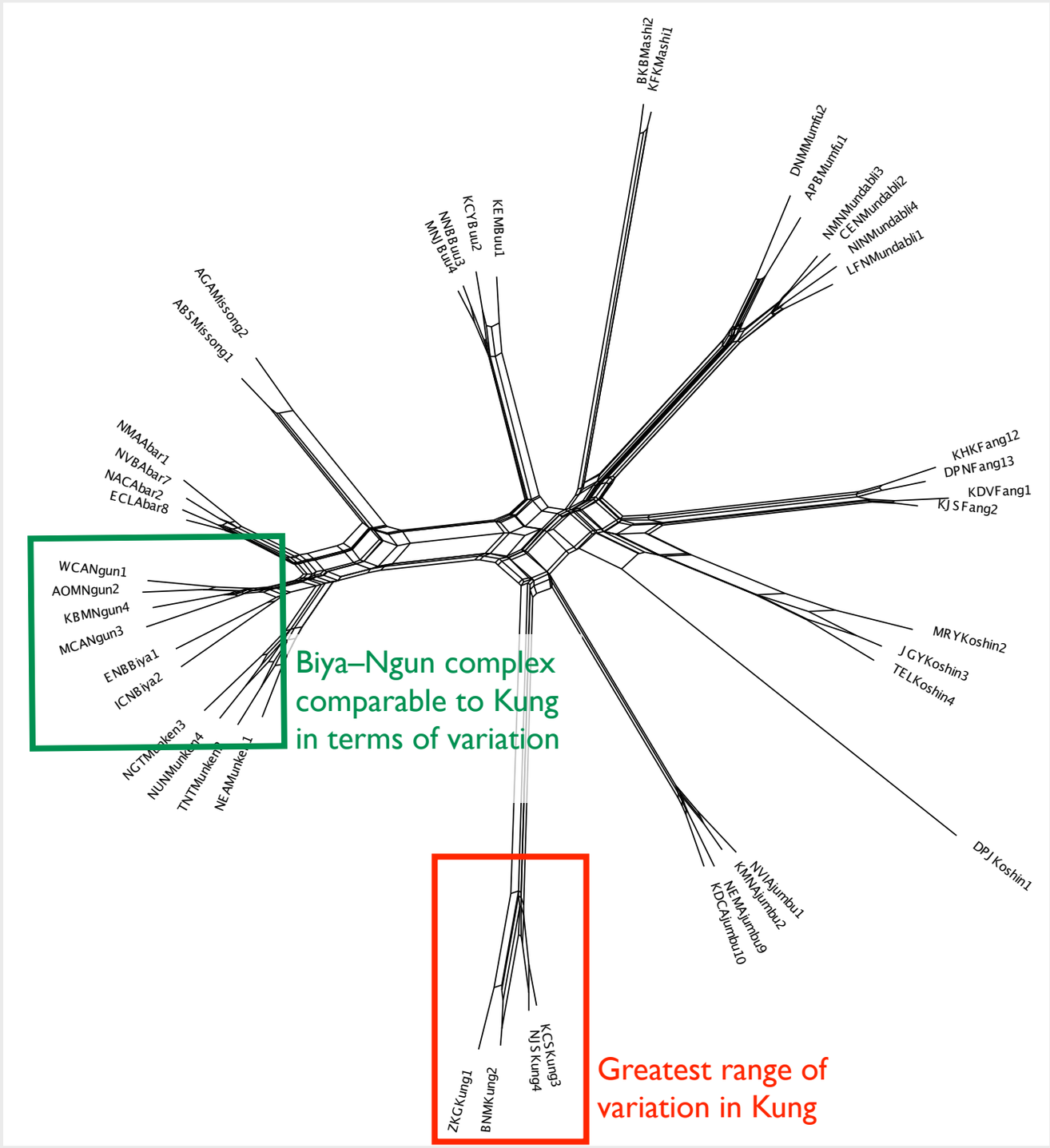

Finding emblematic differences

- In a highly multilingual space, what lexicogrammatical distinctions become markers of different "languages"?
- Watson (2018) explores this for the Casamance region of Senegal, looking especially at phonological factors
- This dataset allows us to explore which meanings are associated with more or less "cognate" variation

Concept: *1044_pot* (ID: 7)			
CogID	**Language**	**Entry**	**Aligned Entry**
165	BNMKung2	tɔ¹ɪ¹	t ɔ 1 ɪ 1
165	KCSKung3	tɔ¹j	t ɔ 1 j -
165	NJSKung4	tɔ¹ɪ¹	t ɔ 1 ɪ 1
165	ZKGKung1	tɔ¹ɪ¹	t ɔ 1 ɪ 1
168	DPJKoshin1	wə⁵n	w ə 5 n - - - - - -
168	KBMNgun4	fi¹nsʊː¹	f i 1 n s ʊː 1 - - -
168	KMNAjumbu2	fə¹ŋkʊː¹	f ə 1 ŋ k ʊː 1 - - -
168	NVIAjumbu1	fə¹ŋkoː¹	f ə 1 ŋ k oː 1 - - -
168	WCANgun1	fi¹nsʊː⁵¹ʊ⁵	f i 1 n s ʊː 5 1 ʊ 5
169	DPNFang13	ʃʲø³	ʃʲ ø 3 -
169	KDVFang1	ʃu⁵³	ʃ u 5 3
169	KHKFang12	ʃʉː⁵³	ʃ ʉː 5 3
169	KJSFang2	ʃu⁵³	ʃ u 5 3
172	ICNBiya2	nti⁵sə⁵	--
176	KCYBuu2	pje⁵¹sə¹	p j e 5 1 s ə 1
176	KEMBuu1	pje⁵¹sə¹	p j e 5 1 s ə 1
176	MNJBuu4	pje⁵¹sə¹	p j e 5 1 s ə 1
176	NNBBuu3	pje⁵¹sə¹	p j e 5 1 s ə 1
177	KDCAjumbu10	nko¹	- - n k - o 1 - - -
177	NEAMunken1	ŋkˣjə¹hə¹	- - ŋ kˣ j ə 1 h ə 1
177	NEMAjumbu9	nko¹	- - n k - o 1 - - -
177	NGTMunken3	ŋ¹kʲɛ¹hɛ¹	ŋ 1 - kʲ - ɛ 1 h ɛ 1
177	NUNMunken4	ŋ¹kɛ¹hɛ¹	ŋ 1 - k - ɛ 1 h ɛ 1
177	TNTMunken2	ŋkjə¹sə¹	- - ŋ k j ə 1 s ə 1

Concept: *1306_stomach* (ID: 28)			
CogID	**Language**	**Entry**	**Aligned Entry**
661	DPNFang13	tʊː¹mə⁵	- - - - t - ʊː 1 - m ə 5
661	KDCAjumbu10	kə⁵tʷaː⁵mə¹	k ə 5 - tʷ - aː 5 - m ə 1
661	KEMBuu1	kə¹tuː¹m	k ə 1 - t - uː 1 - m - -
661	KHKFang12	tøː⁵mə⁵	- - - - t - øː 5 - m ə 5
661	KMNAjumbu2	kə¹twaː¹mə¹	k ə 1 - t w aː 1 - m ə 1
661	LFNMundabli1	two³m	- - - - t w o 3 - m - -
661	MCANgun3	kə¹ntɔ³m	k ə 1 n t - ɔ 3 - m - -
661	MNJBuu4	kə¹to³m	k ə 1 - t - o 3 - m - -
661	NACAbar2	kə¹tʷo³m	k ə 1 - tʷ - o 3 - m - -
661	NEAMunken1	a¹ntʊ³m	- a 1 n t - ʊ 3 - m - -
661	NGTMunken3	n¹tʊ³m	- n 1 - t - ʊ 3 - m - -
661	NINMundabli4	twoː¹m	- - - - t w oː 1 - m - -
661	NJSKung4	kə¹toː¹⁵m	k ə 1 - t - oː 1 5 m - -
661	NMNMundabli3	tʷo³m	- - - - tʷ - o 3 - m - -
661	NNBBuu3	kə¹tʊ³m	k ə 1 - t - ʊ 3 - m - -
661	NUNMunken4	a¹ntʊ³m	- a 1 n t - ʊ 3 - m - -
661	NVBAbar7	kə¹to³m	k ə 1 - t - o 3 - m - -
661	TELKoshin4	kə¹ntĩː¹kə¹	k ə 1 n t - ĩː 1 - k ə 1
661	TNTMunken2	a¹ntʊ³m	- a 1 n t - ʊ 3 - m - -
661	WCANgun1	kə¹ntɔ³m	k ə 1 n t - ɔ 3 - m - -
668	KDVFang1	ŋkʊ¹⁵m	ŋ k ʊ 1 5 m
668	KJSFang2	ŋkʊ¹⁵m	ŋ k ʊ 1 5 m
677	MRYKoshin2	kwə⁵	--
684	NMAAbar1	a⁵mbi⁵	--
689	NVIAjumbu1	kə⁵zo⁵¹	--
693	ZKGKung1	nɛː⁵¹	--

Most and least stable concepts based on those found in at least 33 wordlists (136 concepts in total)

Calculated as normalized entropy based on similarity sets

Most homogeneous

Concept	Homogeneity
ear	0.97
cow (cattle)	0.95
ladder	0.95
tongue	0.92
child	0.92
book	0.92
breast	0.91
bag	0.89
mother	0.89
axe	0.89
soap	0.87
chief	0.85
sheep	0.84
dry season	0.83
horse	0.83
gong	0.83
hair	0.82
raffia bamboo	0.82
song	0.82
camwood	0.81
grave	0.81
father	0.81
sieve	0.80
fence	0.79
heart	0.79
rainbow	0.79

Most heterogeneous

Concept	Homogeneity
snake	0.52
water	0.52
cup	0.52
banana	0.52
grasshopper	0.51
sky	0.50
sun	0.50
moon	0.50
zinc	0.48
drum	0.48
fly (bird)	0.48
garden egg	0.48
soldier ant	0.47
trap	0.47
pot	0.45
storm wind	0.45
elephant stalk	0.45
story	0.43
day	0.43
compound	0.41
knife	0.40
star	0.36
termite	0.32
rainbow	0.31

Concluding questions

- This individual-based approach to wordlist collection seems to be yielding promising results
- Various questions remain open
  - How can we bring individual-level sociolinguistic data more directly into the analysis?
  - How do we build these individual-level patterns into models of diversification within Benue-Congo?
  - How do the Lower Fungom patterns compare to other parts of the Benue-Congo area?
  - How do we evaluate the best way to apply these methods?

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