

Phonology of East Caucasian languages

George Moroz

Linguistic Convergence Laboratory, NRU HSE

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part of the online course on East Caucasian languages

last version of the presentation is available here: tinyurl.com/y2foe09g



Outline of the talk

Introduction

Data

Methods

Inventory size

Frequency analysis

Compare to other databases

Suprasegmental features

About phonology of East Caucasian languages

- phonology
 - [Kibrik and Kodzasov 1990]
 - The indigenous languages of the Caucasus: [Job and Smeets 1994], [Smeets 1994]
 - Yaziki mira: [Alekseev et al. 2001] and predecessor projects
 - [Grawunder 2017]
 - The Oxford Handbook of Languages of the Caucasus: [Beguš 2021], [Boris 2021a], [Boris 2021b]
 - Handbook of Caucasian Languages: [Koryakov and Maisak Fort]
 - and phonological part in more general descriptions of East Caucasian languages
- historical-comparative phonetics
 - S. M. Gasanova, G. Kh. Ibragimov, P. T. Magomedova, U. A. Meylanova, B. B. Talibov, S. M. Khaydakov, A. E. Alekseev, Ju. D. Desheriev, B. K. Gigineishvili, D. S. Imnaishvili, J. Nichols, S. L. Nikolayev, S. A. Starostin, A. S. Kasyan, N. A. Ardoteli, O. A. Mudrak

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Languages

- Nakh
 - Chechen
 - Ingush
 - Tsova-Tush
(Bats, Batsbi)
- Tsezic (Didoic)
 - Tsez
 - Hinuq
 - Bezhta
 - Hunzib
 - Khwarshi-Inkhoqwari
- Avar–Andic
 - Avar
 - Andi
 - Botlikh
 - Godoberi
 - Chamalal
 - Karata
 - Tindi
 - Bagvalal
 - Akhvakh
 - Dargwa
 - Lak
- Lezgic
 - Archi
 - Tabasaran
 - Aghul
 - Lezgian
 - Udi
 - Budukh
 - Kryz
 - Rutul
 - Tsakhur
 - Khinalug

Languages not present in [Kibrik and Kodzasov 1990]

- Nakh
 - Chechen
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Languages not present in [Kibrik and Kodzasov 1990]

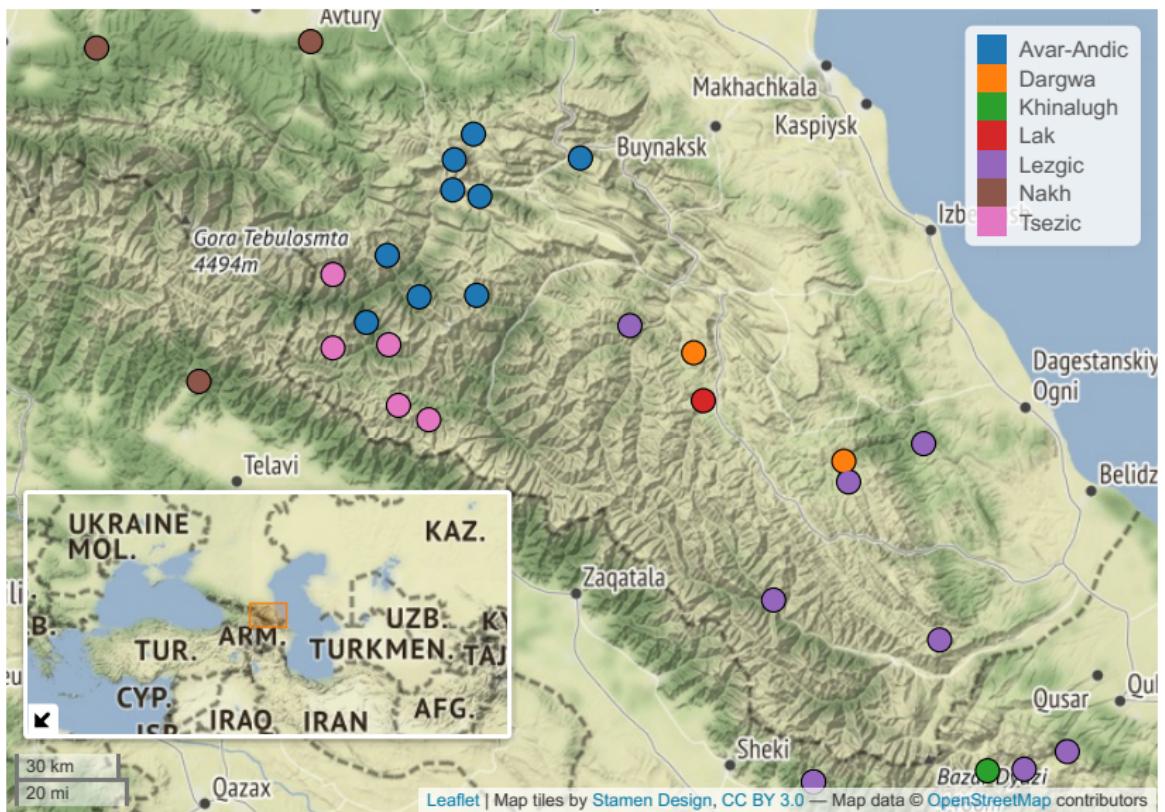
- Andic, Bagvalal [Kibrik et al. 2001]
- Andic, Botlikh [Alexeyev and Verhees Fort]
- Andic, Godoberi [Moroz et al. Fort]
- Andic, Karata [Magomedbekova 1971]
- Dargwa, Mehweb [Moroz 2019]
- Nakh, Chechen [Nichols 1994a]
- Nakh, Ingush [Nichols 1994b]
- Nakh, Tsoved-Tush [Holisky and Gagua 1994]

Data

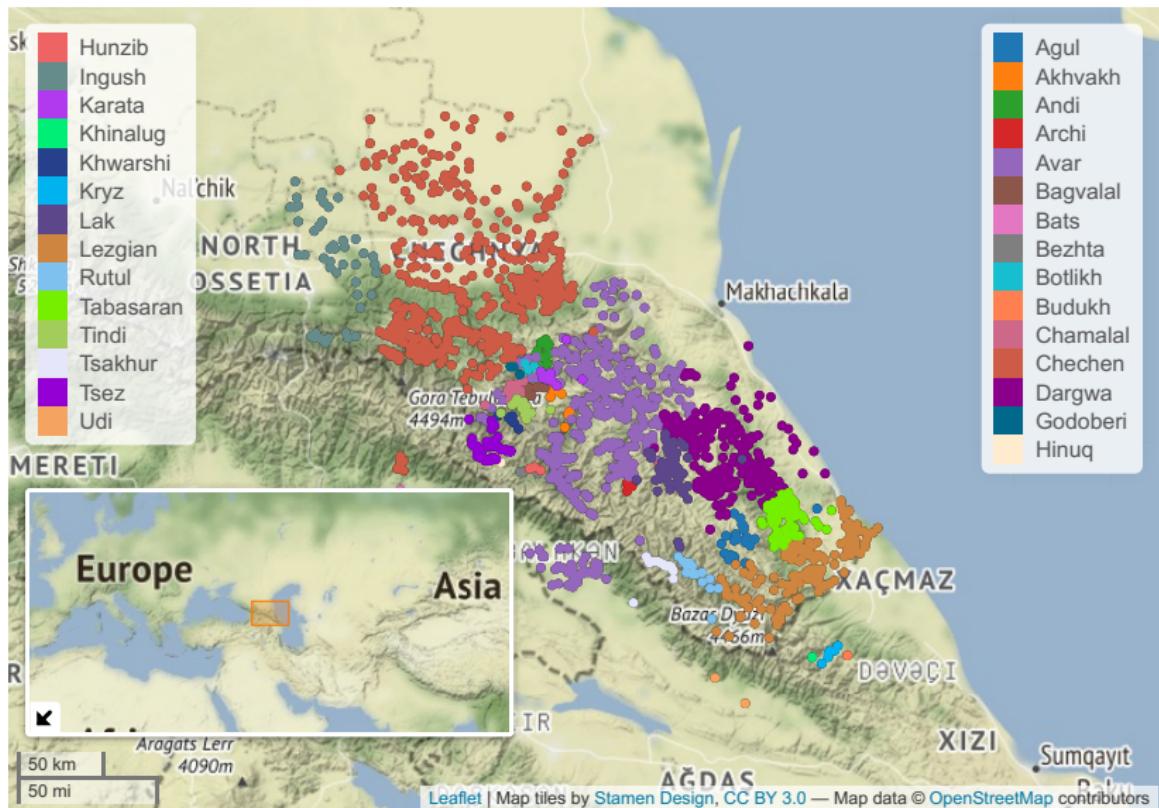
1905 × 9 **table** with the following columns:

- id
- branch
- language
- segments_IPA
- segments_source
- sound_type
- source
- comments
- glottocode

Data (language view)



Data (village view)



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Phonology of East Caucasian languages can be presented like this...

	Stops				Fricatives			Affricates				Son.
	Voiced	Voiceless			Voiced	Voiceless		Voiced	Voiceless			
			Gem.	Ej.			Gem.			Gem.	Ej.	
Lab.	b ɓ	p ń										w ń m m
Den.	d ڏ	t ٿ	t: ٿ	t' ٿI	z ڙ	s ڙ	s: ڙ		c ڙ	c: ڙ	c' ڙI	n ڻ
Alv.					ž ڇ	š ڦ	š: ڦ	ž ڇ	č ڇ	č: ڇ	č' ڇI	r p
Lat.						ł ڦ	ł: ڦ			ł ڦI	ł' ڦ	l l
Pal.												j ڙ
Vel.	g ڳ	k ڪ	k: ڪ	k' ڪI			x ڦ					
Uv.		q ڦ		q' ڦ	v ڦ	χ ڦ	χ: ڦ					
Ph.					f ڦI	h ڦI						

Phonology of East Caucasian languages can be presented like this...

	Stops			Fricatives			Affricates			Son.	
			plosives			fricatives		affricates			sonorant
			asp	ej	vcd	asp	vcd	asp	ej	vcd	
Lab.	labial		p		b						w, m
	dental	-gem	t	t'	d	s	z	c	c'		n
Den.		+gem				s:		c:	c':		
alveolar	-gem				š	ž	č	č'	č̄	r	
	Alv.		+gem				š:		č:	č':	
lateral					ł (ł:)		ł	ł'		ł	
Lat.	palatal					ç, çʷ					j
	velar	-gem	k, kʷ	k', k'ʷ	g, gʷ						
Vel.		+gem	k:, k:ʷ	k':,							
uvular	-gem		q', q'ʷ		χ, χʷ	χ, χʷ	qχ, qχʷ				
	Uv.		+gem				χ:				
pharyngeal											
Ph.		-gem									
		+gem									

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	Stops			Fricatives			Affricates			Son.
	plosives			fricatives		affricates			sonorant	
	asp	ej	vcd	asp	vcd	asp	ej	vcd		
Lab.	labi	labial	dental	alveolar	palatal	velar	uvular	pharyngeal	epig	
Den.	den	-lab	+lab	-lab	+lab	-lab	+lab	-lab	-lab	
Alv.	plosive	+v	b	d		g	g ^w		(?)	
	alvc	-v	p'	t'		k	k ^w	q	q ^w	
		ej	p'	t'		k'	k' ^w	q'	q' ^w	
Lat.	fricative	+v		z	ž	(y)		š	š ^w	
	late	-v		s	š	x	x ^w	χ	χ ^w	
								h	h ^w	
									(h)	
Pal.	pal:	+v		(ʒ)	(ʒ)					
	affricate	-v		c	č					
		ej		c'	č'					
Vel.	vel:	sonorant	m, w	n, l, r	j					
Uv.		---	--	--	--					
Ph.	uvular	-gem		q', q" ^w		χ, χ ^w	š, š ^w	qχ, qχ ^w		
		+gem				χ:				

This way is...

- boring,

This way is...

- boring,
- mechanical,

This way is...

- boring,
- mechanical,
- it is hard to make generalisations (at least, on the fly)

Phonology of East Caucasian languages can be presented like this...

Nakh-Daghestanian: Essential background, what's distinctive... (Johanna Nichols)



The N-D phonological signature

Complex consonant inventories. Typically:

3 or more manners. t t' d tt /t/ usually [t^h]

Uvular, sometimes lateral, sometimes pharyngeal series

Vowel systems vary in size:

3 or 4 vowel qualities: Lak, several Dargwa

5 Avar, most Andic

6-8 most Tsezic, most Lezgian; Nakh

9-10 Kryz, Budukh, Khinalug



± length, nasalization

Pharyngealization

Epiglottalization vs. true pharyngealization

Segment? syllabic feature? consonant feature? vowel feature?

Syllable structure fairly simple: mostly CVRC

Tones ...

▶ ⏴ 🔊 37:24 / 1:30:04



Phonology of East Caucasian languages can be presented like this...

Nakh-Daghestanian: Essential background, what's distinctive... (Johanna Nichols)



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(If you have not seen it, go and watch our previous lecture!)

These ways are...

- To list all inventories
 - boring,
 - mechanical,
 - hard to make generalisations (at least, on the fly)
- To present generalisations
 - restricted to peculiarities,

These ways are...

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These ways are...

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- May be these conclusions could be data driven?

These ways are...

- To list all inventories
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- To present generalisations
 - restricted to peculiarities,
 - you need to be a specialist
- May be these conclusions could be data driven?
 - some of them can be visualised with a map
 - some of them can be gathered via frequency and combinatorics analysis

Outline of the talk

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Compare to other databases

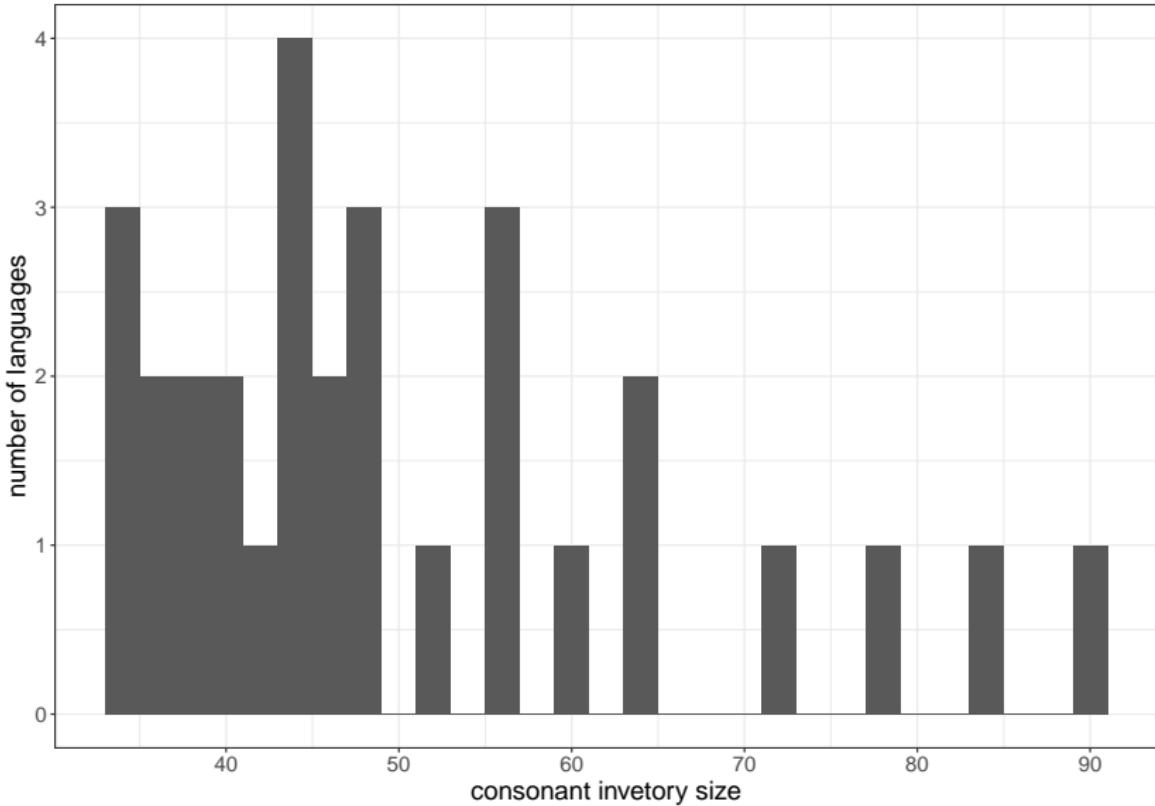
Suprasegmental features

Consonants



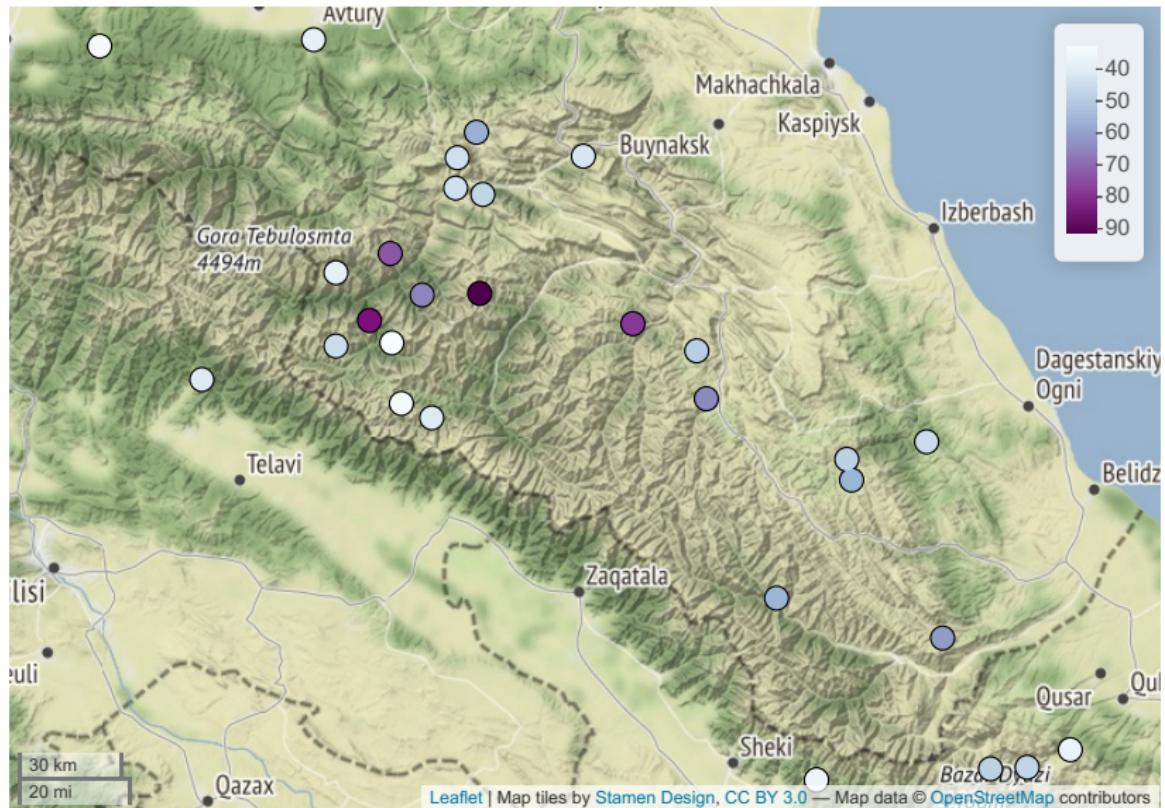
Languages ranges from 33 to 91 consonants.

Consonants



Most of the languages have 42 ± 5 consonants.

Consonants



Most of the huge systems are presented in Andic and grouped together.

Consonants

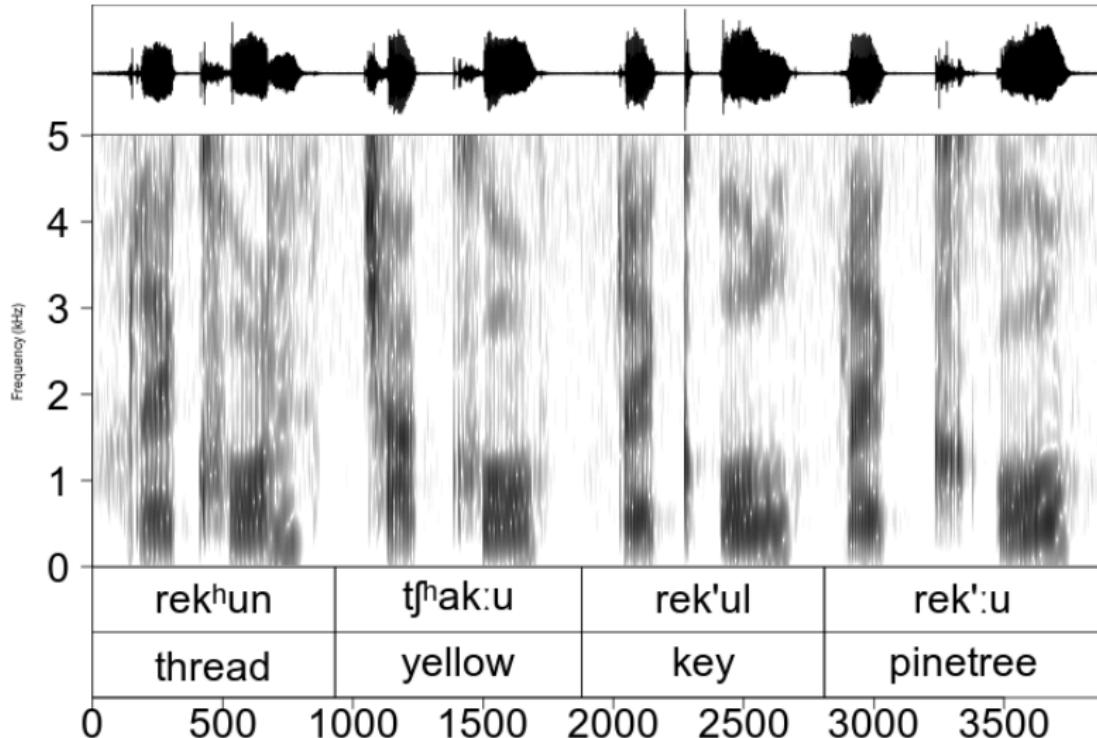
- Akhwakh (Andic) – 91
- Tindi (Andic) – 84
- Chamalal (Andic) – 73
- Archi (Lezgic) – 78
- ...
- Ingush (Nakh) – 34
- Bezhta (Tsezic) – 34
- Inkhoqwari (Tsezic) – 33
- ejectives
- gemenation (fortis)
- labialization

Consonants: Akwakh vs. Inkhoqwari

b	d			dʒ				g					
	d ^w			dʒ ^w				g ^w					
p ^h	t ^h	ts	ts:	tʃ	tʃ:	tɬ	tɬ:	k	k:	q	q:		?
	t ^{hw}	ts ^w	ts: ^w	tʃ ^w	tʃ: ^w	tɬ ^w	tɬ: ^w	k ^w	k: ^w	q ^w	q: ^w		? ^w
p'	t'	ts'	ts: [']	tʃ'	tʃ: [']	tɬ'	tɬ: [']	k'	k: [']	q'	q: [']		
	t ^w	ts ^w	ts: ^w	tʃ ^w	tʃ: ^w	tɬ ^w	tɬ: ^w	k ^w	k: ^w	q ^w	q: ^w		
		z		ʒ						β			ɸ
		z ^w		ʒ ^w						β ^w			
		s	s:	ʃ	ʃ:	ɸ	ɸ:	x	x:	χ	χ:	h	h
		s ^w	s: ^w	ʃ ^w	ʃ: ^w	ɸ ^w	ɸ: ^w	x ^w	x: ^w	χ ^w	χ: ^w		h ^w
m	n												
w	r					l		j					

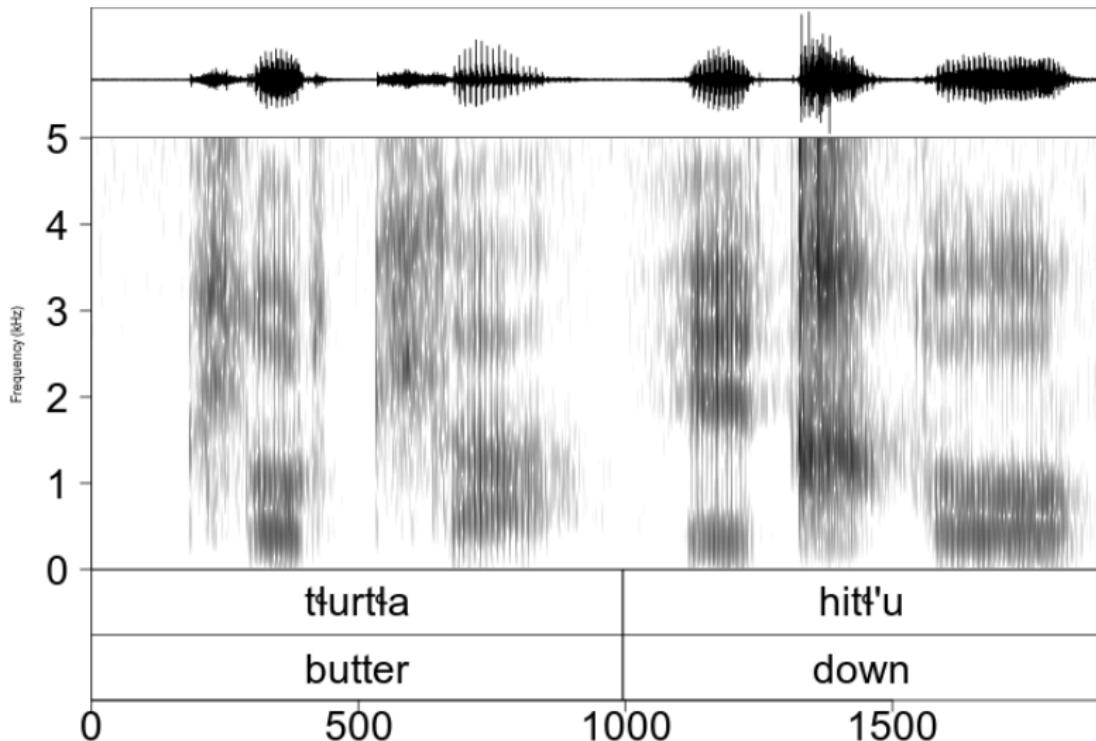
b	d		dʒ		g			
p ^h	t ^h	ts	tʃ	tɬ	k	q		?
p'	t'	ts'	tʃ'	tɬ'	k'	q'		
		z	ʒ		β	ɸ		
		s	ʃ	ɸ	χ	h		
m	n							
w	r			l	j			

Gemination and ejectives (example from Zilo Andi)



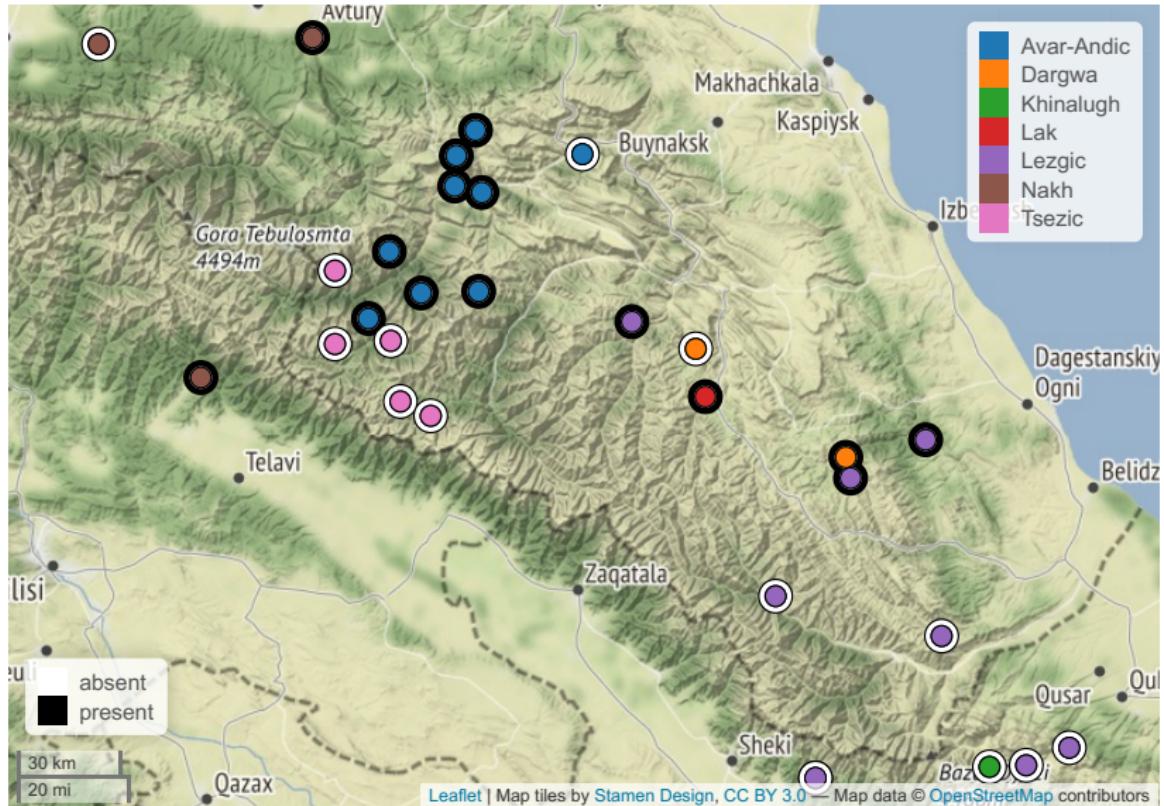
- Geminated aspirated have longer closure.
- Geminated ejectives have longer burst.

Laterals (example from Zilo Andi)



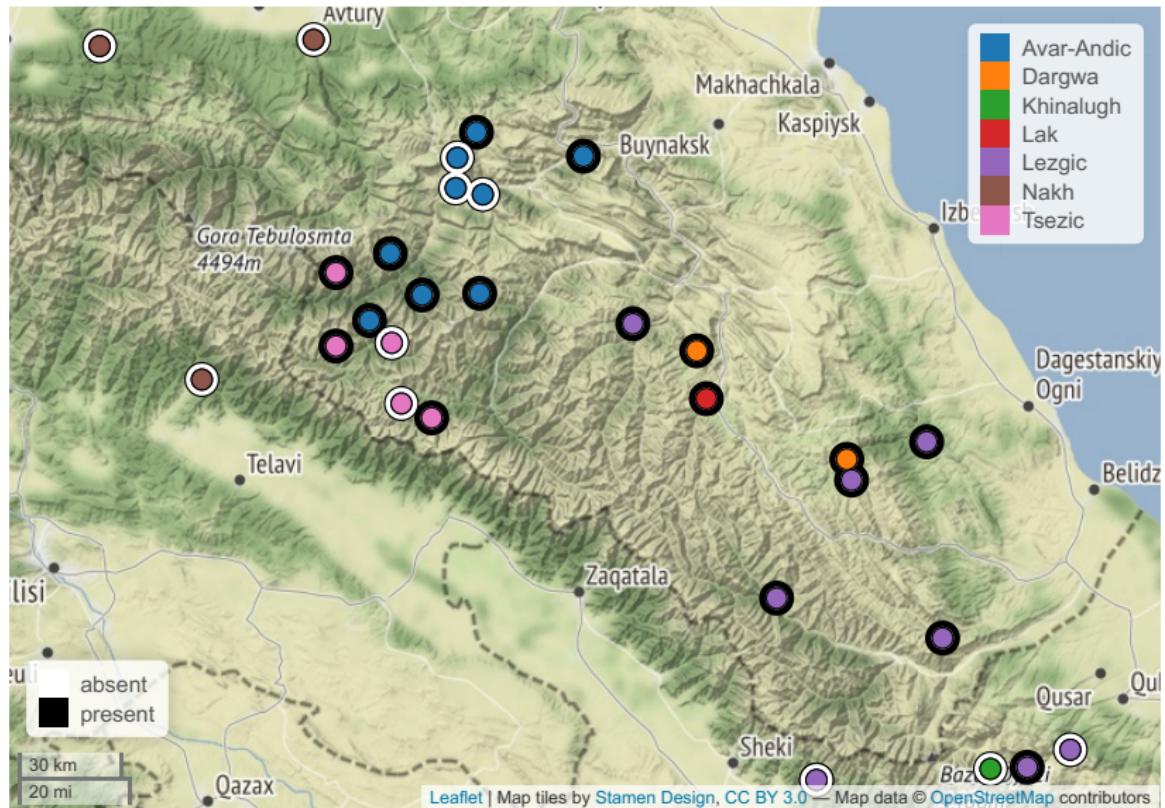
Looks like it is not t̪ but t̪: in Andic...

Geminate consonants



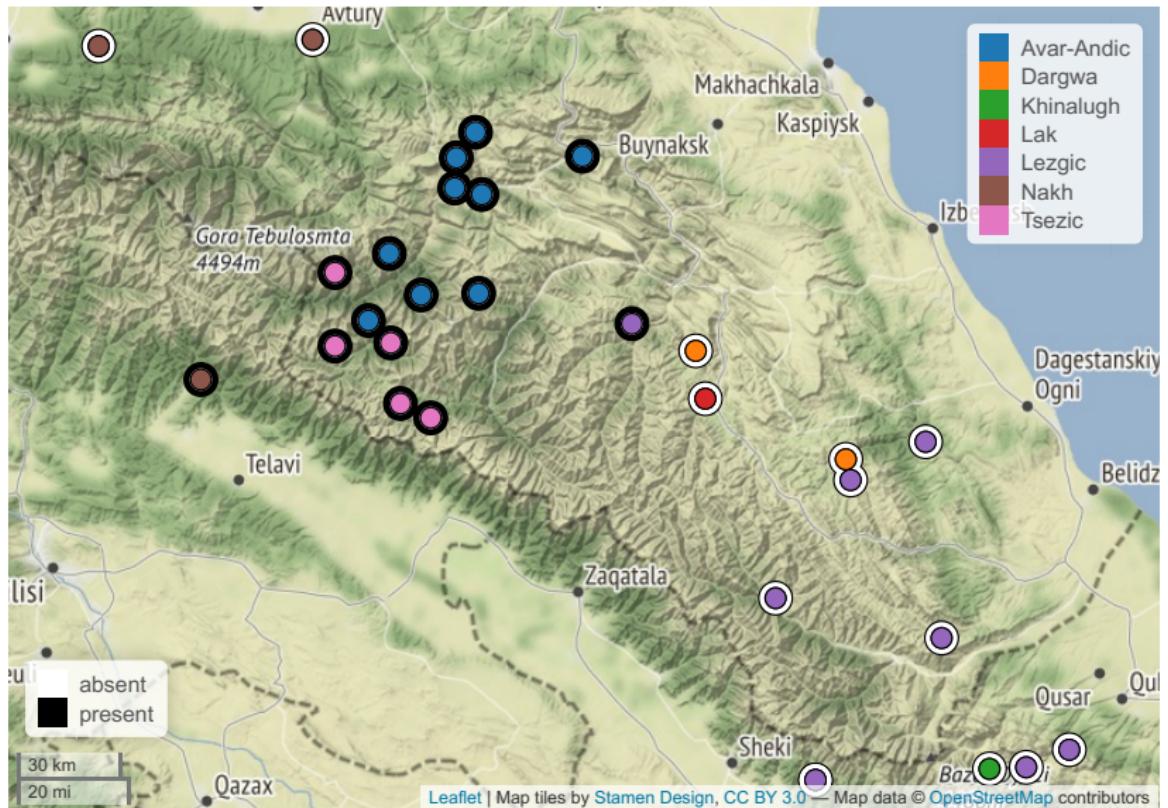
Geminate consonants are absent in Tsezic and most Lezgic.

Labialised consonants



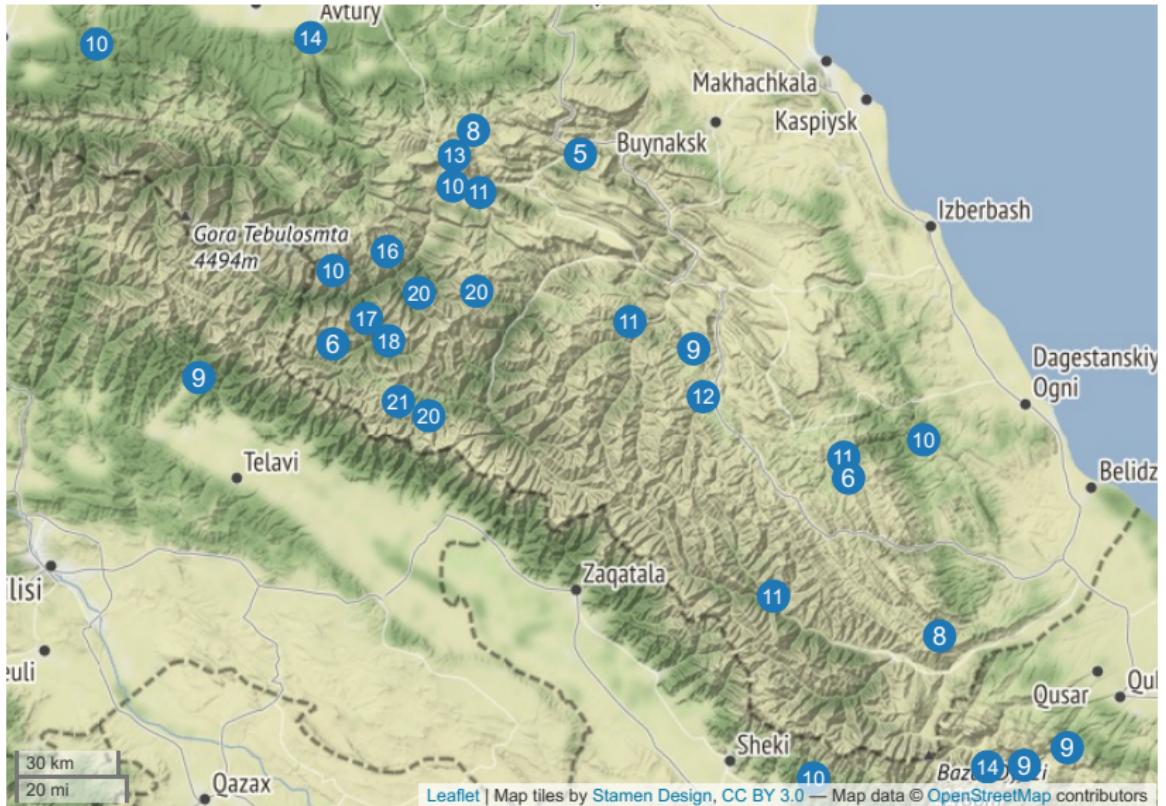
Labialised consonants are absent in Nakh, but more or less common through other branches.

Lateral consonants



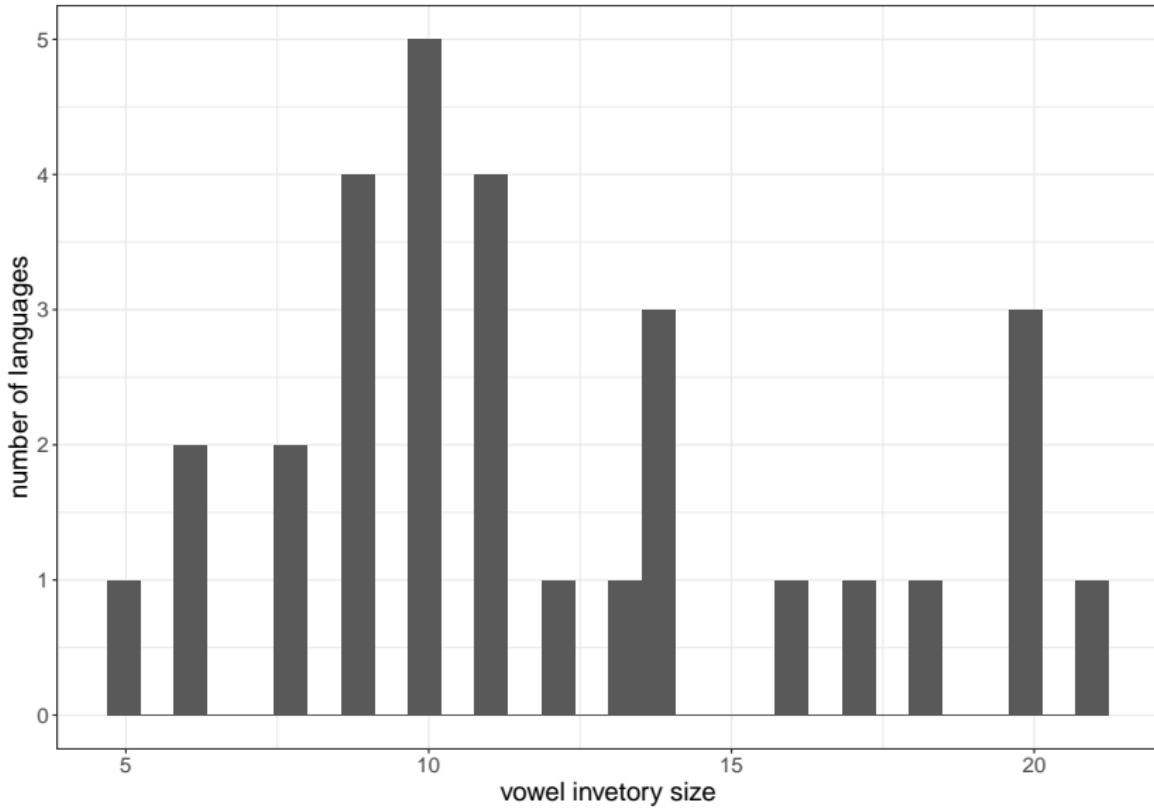
It looks like an areal pattern: all Avar-Andic and Tsezic, but also Tsova-Tush and Archi.

Vowels



Languages ranges from 5 to 21 vowels.

Vowels



Most of the languages have 10 ± 5 vowels.

Vowels

- Bezhta (Tsezic) – 21
- Akhvakh (Andic) – 20
- Hunzib (Tsezic) – 20
- Bagvalal (Andic) – 20
- ...
- Aghul (Lezgic) – 6
- Tsez (Tsezic) – 6
- Avar – 5

Vowels

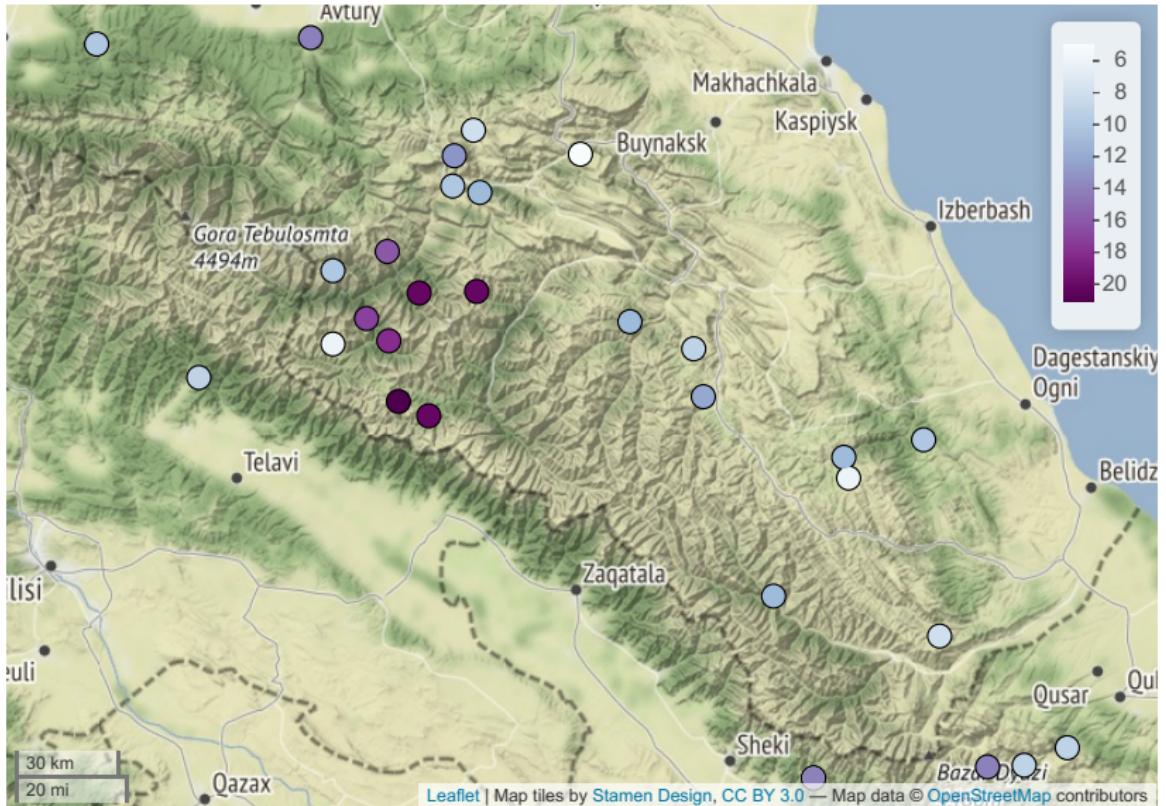
- Bezhta

i	i:	i ⁿ	y	y ⁿ				u	u:	u ⁿ
e		e ⁿ	ø					o	o:	o ⁿ
æ	æ:	æ ⁿ								
					a	a:	a ⁿ			

- Avar

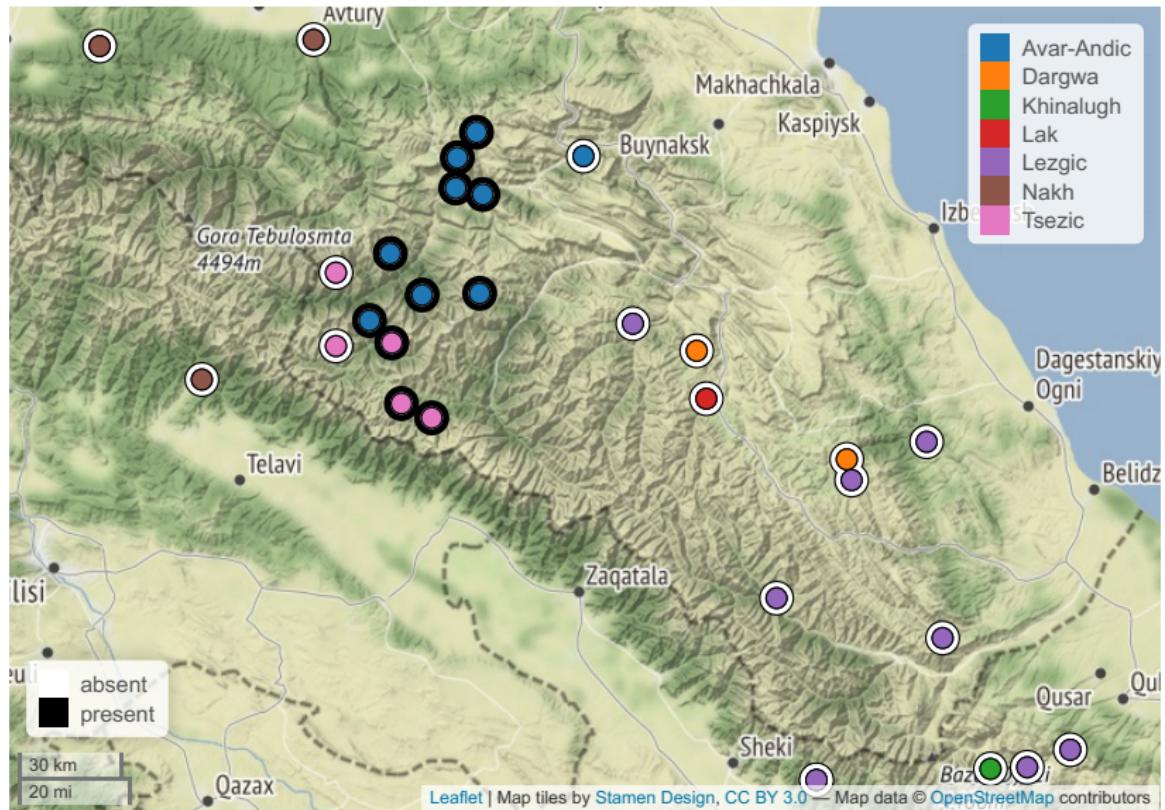
i		u
e		o
	a	

Vowels



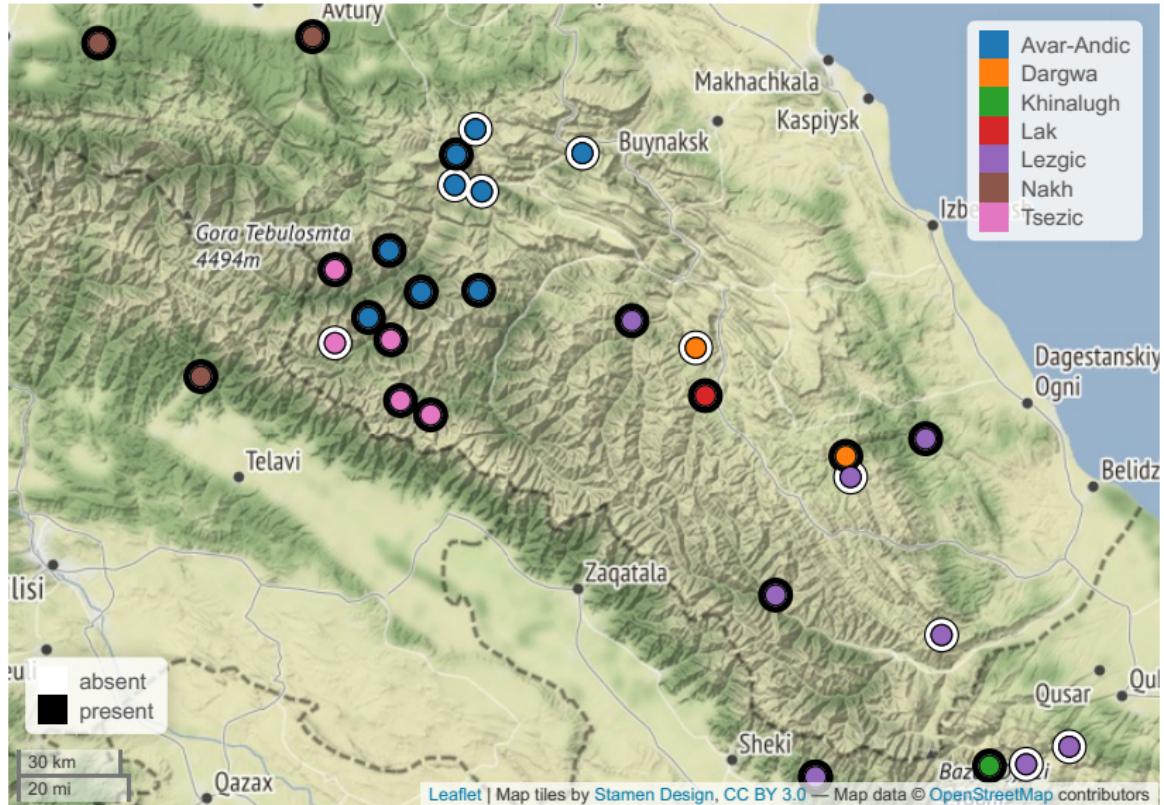
Most of the huge systems are presented in Tsezic and Andic.

Nasal vowels



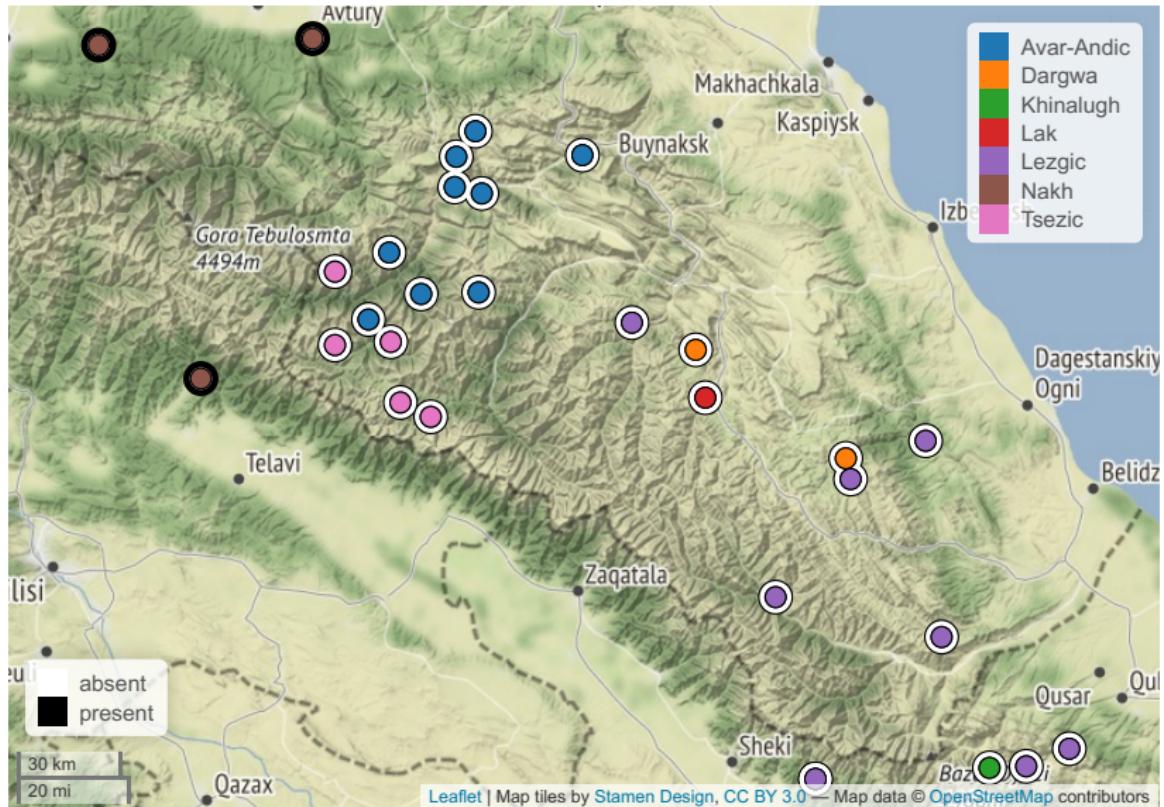
From Andic and Tsezic only Avar, Hinuq, and Tsez lack nasalized vowels.

Long vowels



Long vowels are common to all branches.

Diphthongs



Diphthongs are present only in Nakh.

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Segments present in all languages

b	d					g	
p ^h	t ^h					k ^h	?
		3					
	s	f					h
m	n						
	r		l	j			

- Where are the famous ejectives?

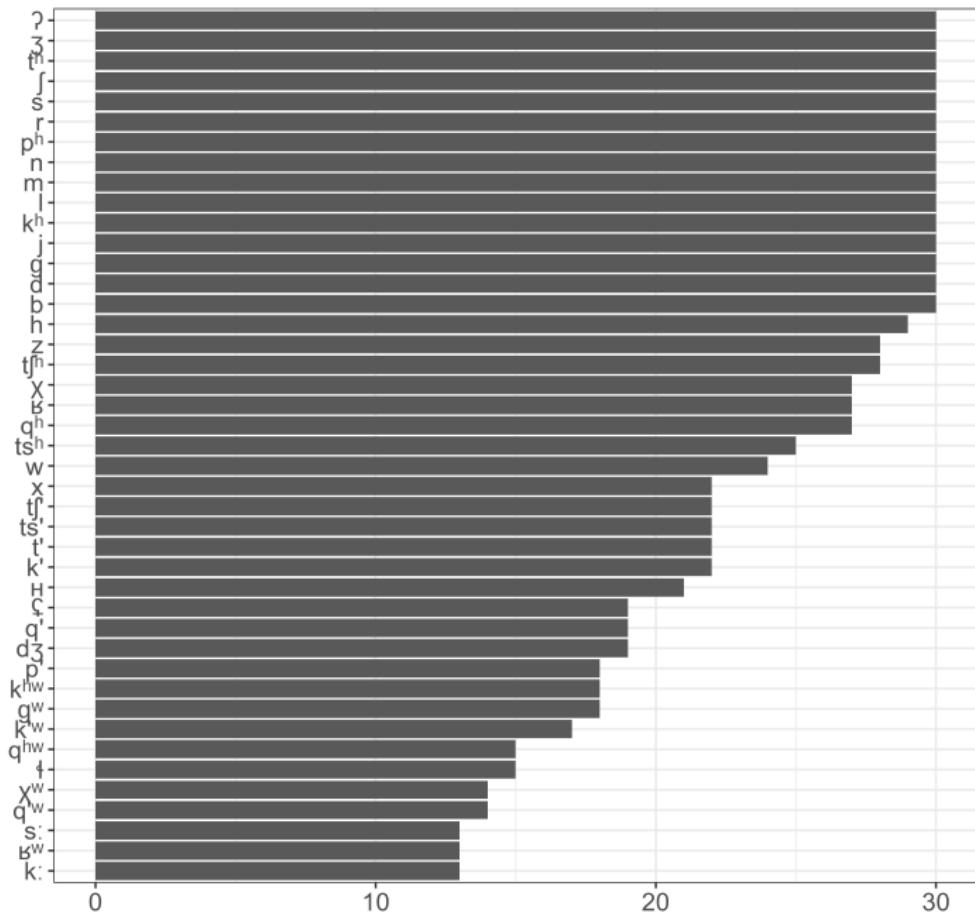
Segments present in all languages

b	d					g	
p ^h	t ^h					k ^h	?
		z					
	s	f					h
m	n						
	r		l	j			

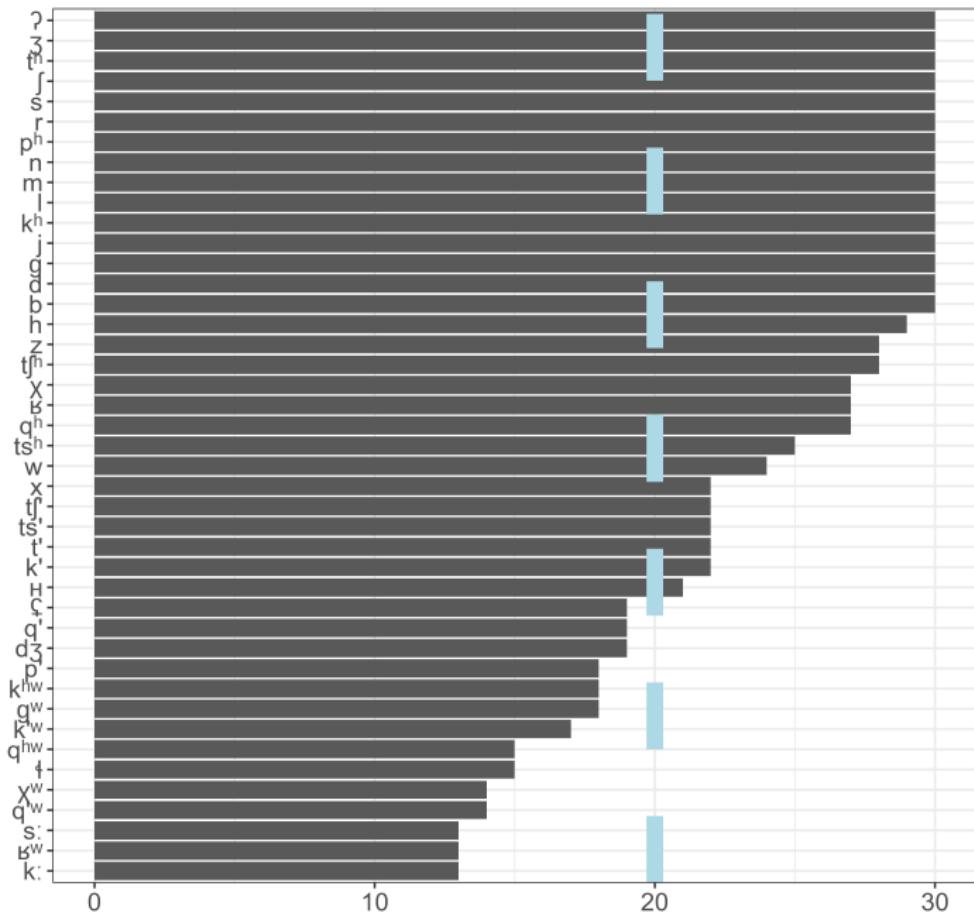
- Where are the famous ejectives? Udi:

b	d	dz	dʒ			g	
p ^h	t ^h	ts ^h	tʃ ^h			k ^h	q ^h
p	t	ts	tʃ			k	q
v		z	ʒ				β
f		s	f			χ	h
m	n						
w	r			l	j		

Consonants: typical inventory



Consonants: typical inventory



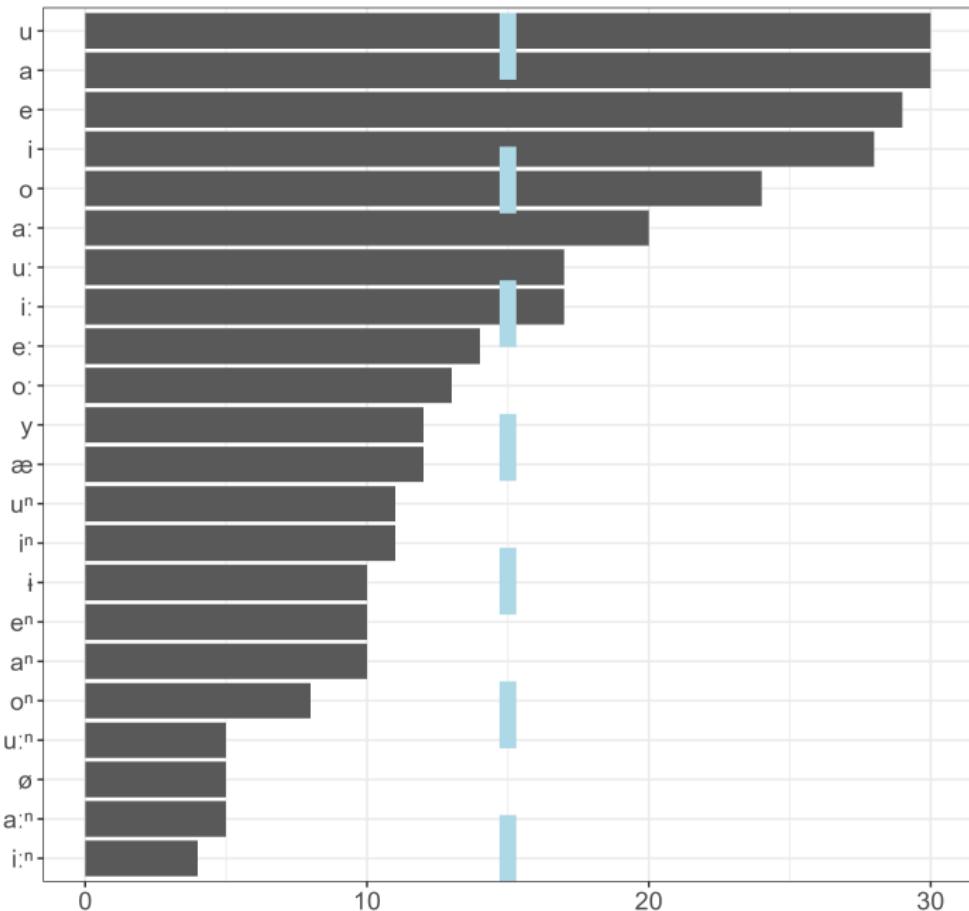
Consonants: typical inventory

b	d					g			
p ^h	t ^h	ts	tʃ ^h			k ^h	q ^h		?
p'	t'	ts'	tʃ'			k'	q'		
		z	ʒ				v	f	
w		s	ʃ			x	χ	h	h
m	n								
	r			l	j				

For more consonants:

- labialisation
- gemination
- laterals
- pharyngealisation

Vowels: typical inventory



Vowels: typical inventory

i	iː			u	uː
e				o	
		a	aː		

For more vowels:

- length
- nasalization
- pharyngealization

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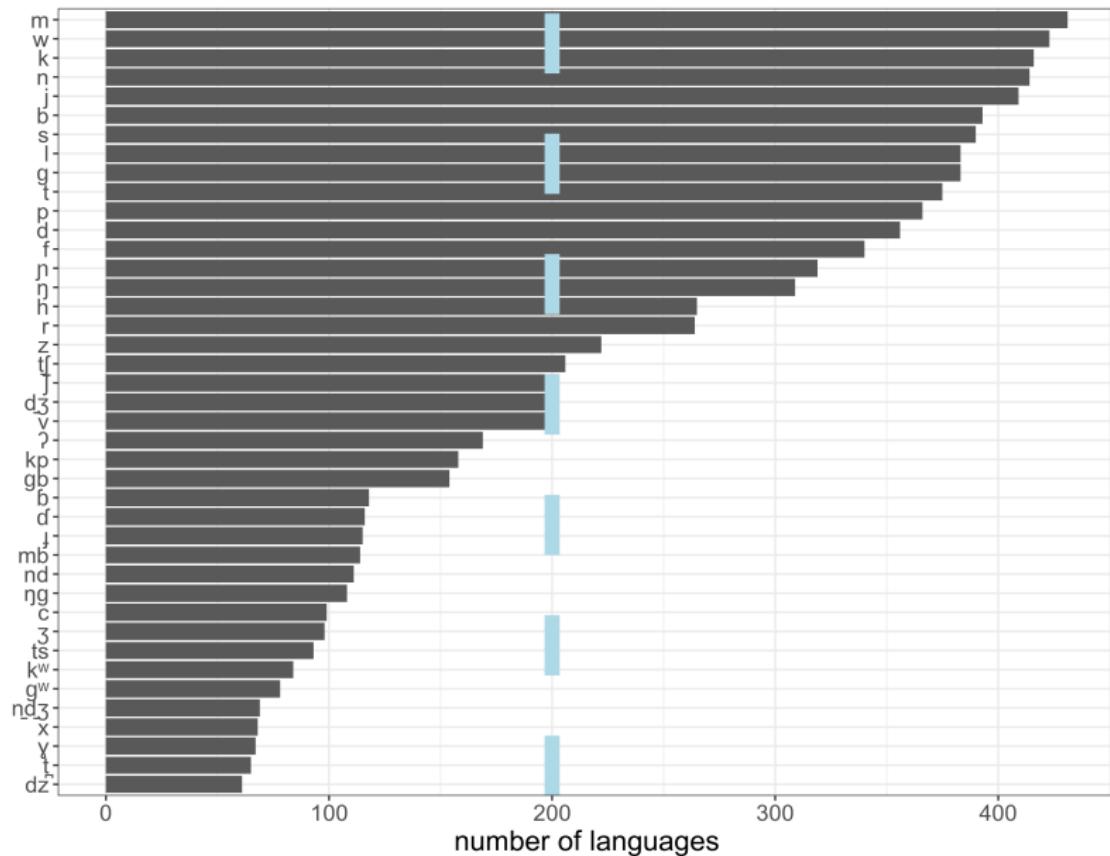
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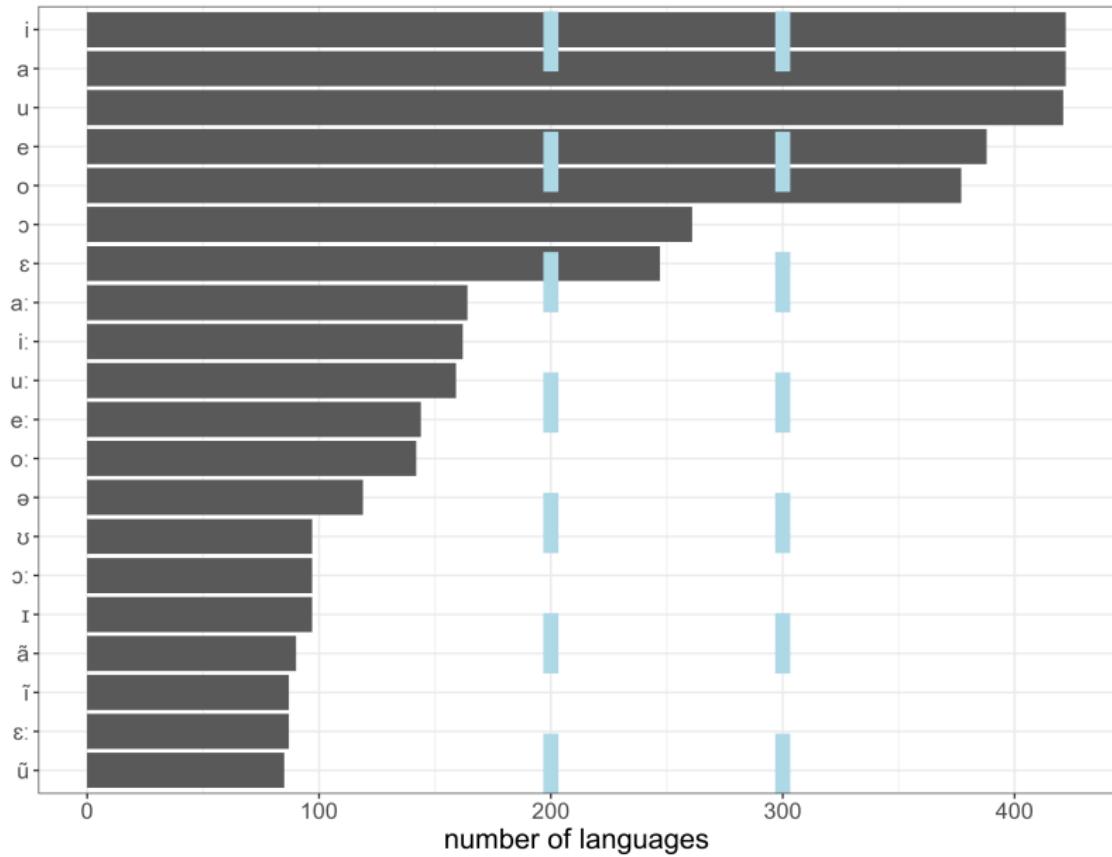
PHOIBLE [Moran and McCloy 2019]: consonants



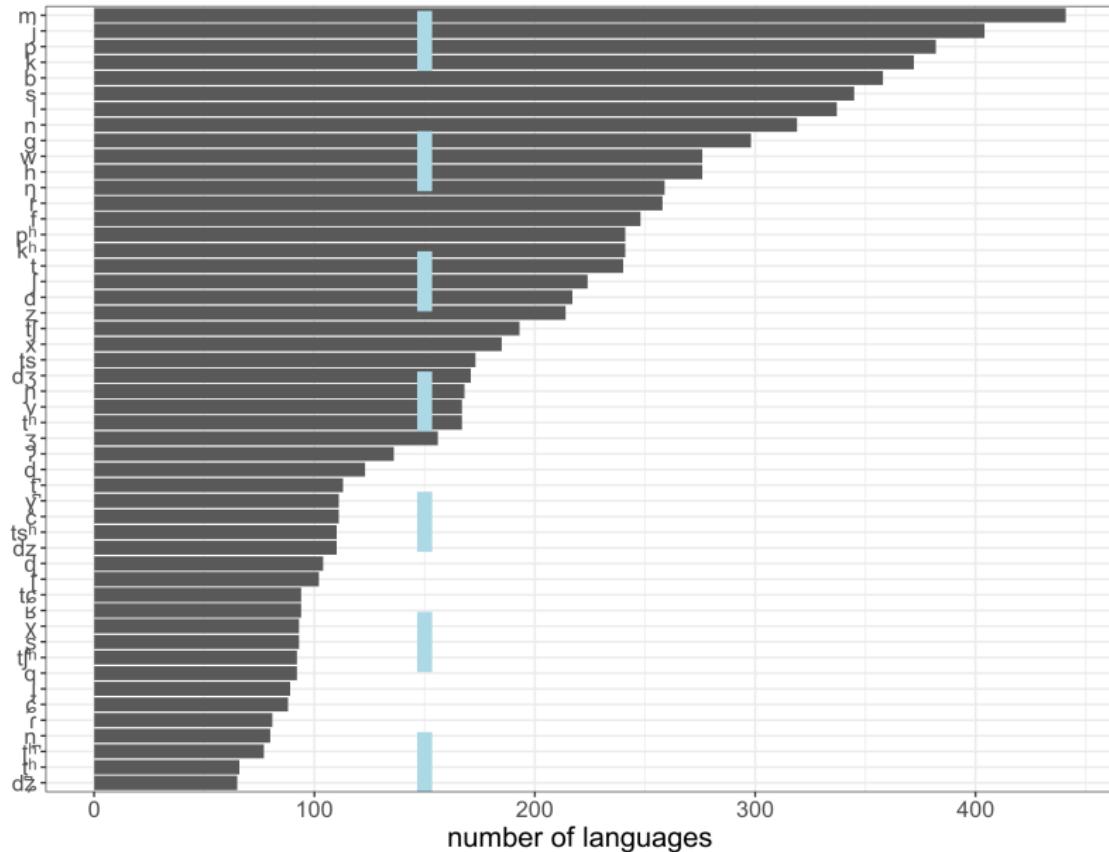
PHOIBLE [Moran and McCloy 2019]: consonants

b	d		dʒ			g	
p	t		tʃ			k	
		z	ʃ				
f		s					h
m	n				jɪ	ɪj	
w	r			l	j		

PHOIBLE [Moran and McCloy 2019]: vowels



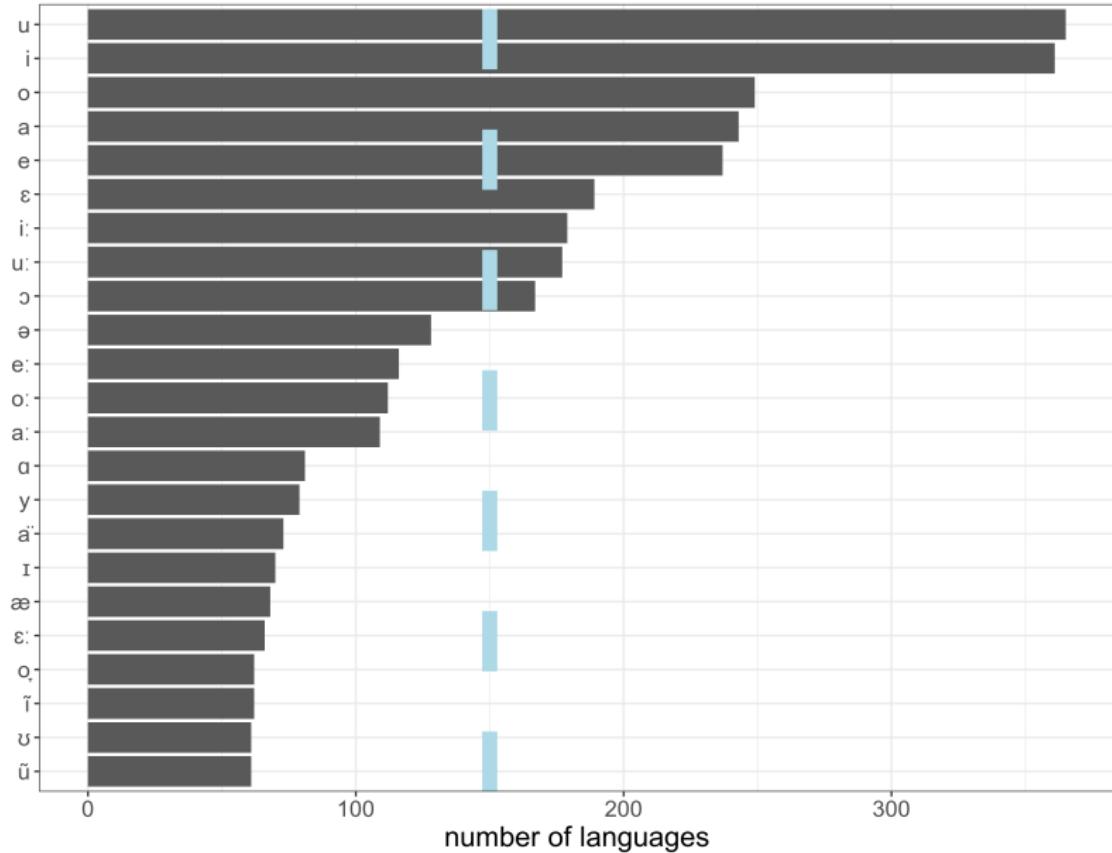
Eurasian phonological inventories [Nikolaev et al. 2015]: consonants



Eurasian phonological inventories [Nikolaev et al. 2015]: consonants

b	d		dʒ			g	
p	t	ts	tʃ			k	
p ^h	t ^h					k ^h	
		z	ʒ				
f	v	s	ʃ			x	h
m	n				jn	ŋ	
w	r			l	j		

Eurasian phonological inventories [Nikolaev et al. 2015]: vowels



Conclusions

- East Caucasian consonant systems are more or less typical

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 - except uvular and laryngeal consonants
 - except ejective consonants
 - except laterals in Avar-Andic branch
 - except labialisation
 - except gemination

Conclusions

- East Caucasian consonant systems are more or less typical
 - except uvular and laryngeal consonants
 - except ejective consonants
 - except laterals in Avar-Andic branch
 - except labialisation
 - except gemination
- East Caucasian vowel systems are typical

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Suprasegmental features

Syllable structure and suprasegmental features

Syllable structure CVCC, sometimes CVL (L – sonorant or *b*).

A lot of East Caucasian languages has stress:

- some languages has more o less fixed stress (e. g. Mehweb)
- some languages has a tendency to have stress on first three syllables (Andic languages)
- a lot of languages distinguish morphological meanings via stress (e. g. plural marker in Dargic languages)

pharyngealization – mysterious feature (absent in Andic branch).

d-irʔ-an

npl-gather:ipfv-hab

‘gathers them’

d-irʔ-a^fn /d-irʔ^f-an/

npl-gather:ipfv-hab

‘gathers them’

ħa-d-irʔ-an

neg-npl-gather:ipfv-hab

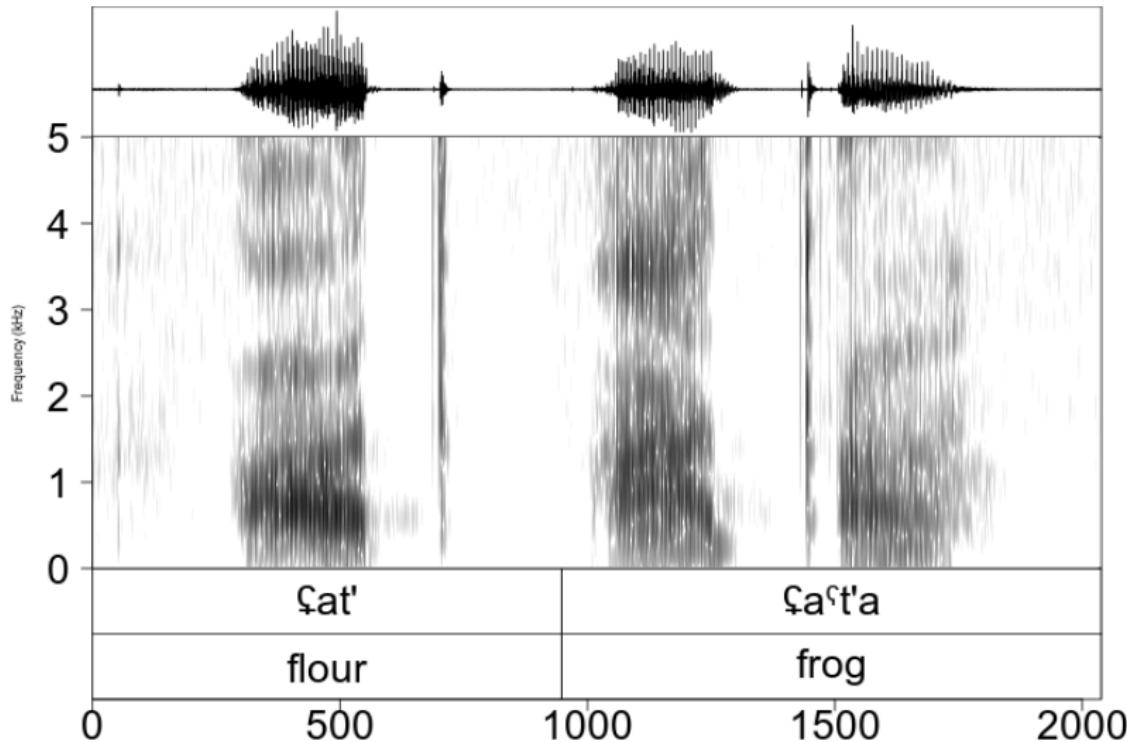
‘does not gather them’

ħa^f-d-irʔ-a^fn

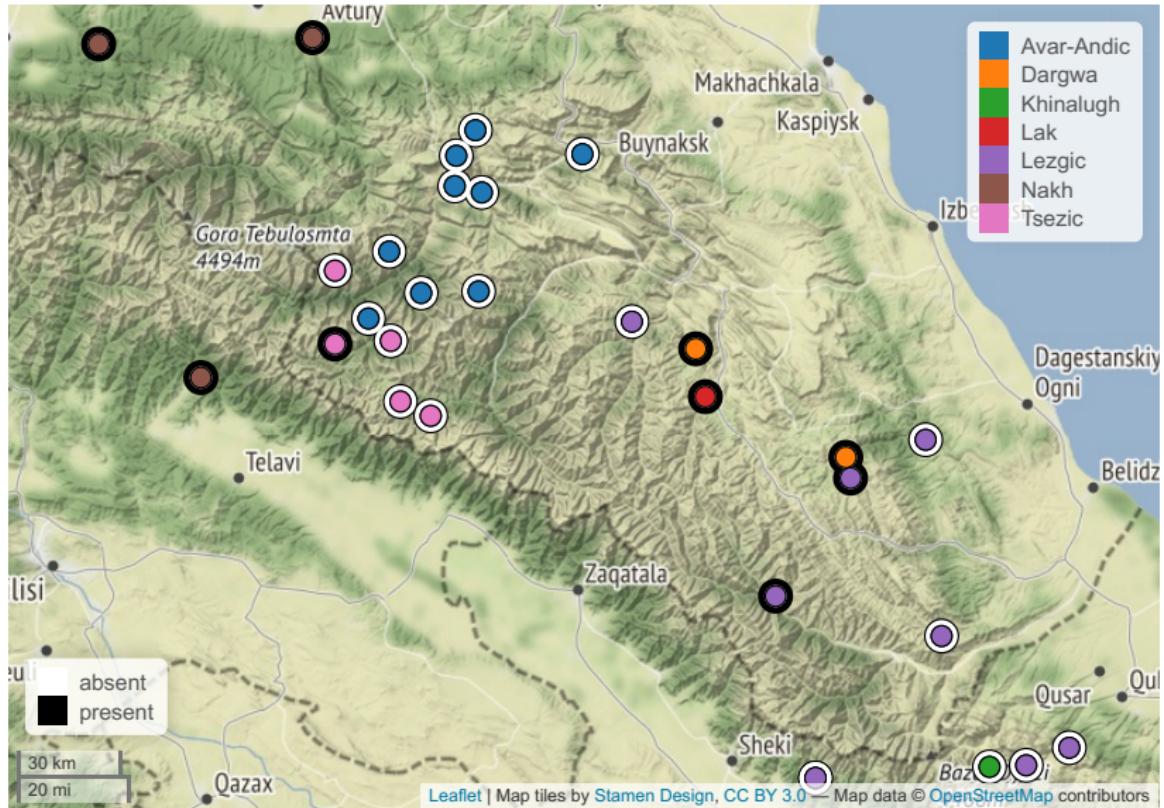
neg-npl-freeze:ipfv-hab

‘they are not freezing’

Pharyngealization (example from Mehweb Dargwa)



Pharyngealization



There are two enclaves: Nakh and Lak-Dargwa.

Thanks

- to reasercher teams who collected all data
- to Viola Ivanova for helping with digitalisation of [Kibrik and Kodzasov 1990]
- to Linguistic Convergence Laboratory for organising this course

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 - and YOU for your attention
-
- if you like presented maps, see [lingtypology](#) [Moroz 2017]
 - spectrograms were created with [phonfieldwork](#) [Moroz 2020]
 - this presentation made with [rmarkdown](#) [Xie et al. 2018] and [ggplot2](#) [Wickham 2016]; source code and data for this presentation are available online: <https://tinyurl.com/y2oh9sg8>

References

- Alekseev, M. E., Starostin, S. A., Klimov, G. A., and Testelets, Y. G. (2001).
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