

Phonology of East Caucasian languages

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part of the online course on East Caucasian languages

last version of the presentation is available here: tinyurl.com/y2foeo9g



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 202]
 - 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
 - Ingush
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(Bats, Batsbi)
- Tsezic (Didoic)
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Languages not present in [Kibrik and Kodzasov 1990]

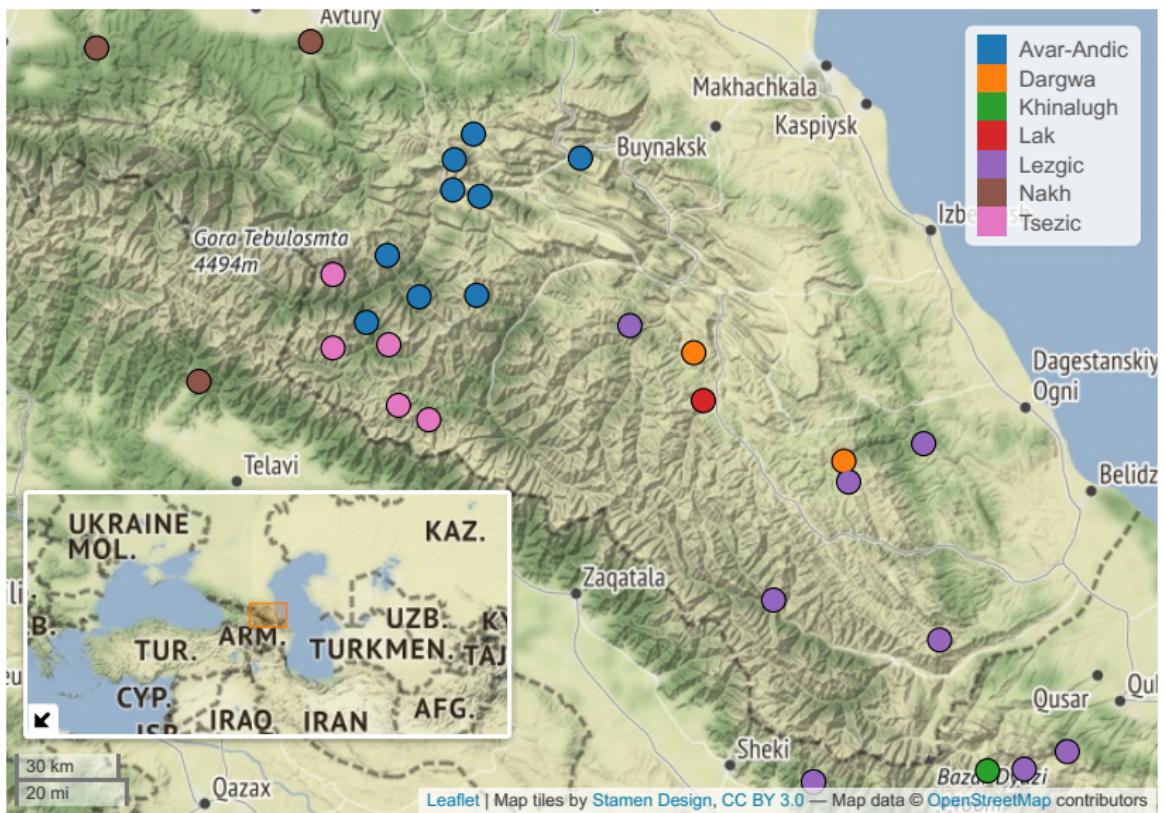
- Andic, Bagvalal [[Kibrik et al. 2001](#)]
- Andic, Botlikh [[Alexeyev and Verhees 202](#)]
- Andic, Godoberi [[Moroz et al. 202](#)]
- Andic, Karata [[Magomedbekova 1971](#)]
- Dargwa, Mehweb [[Moroz 2019](#)]
- Nakh, Chechen [[Nichols 1994a](#)]
- Nakh, Ingush [[Nichols 1994b](#)]
- Nakh, Tsoved-Tush [[Holisky and Gagua 1994](#)]

Data

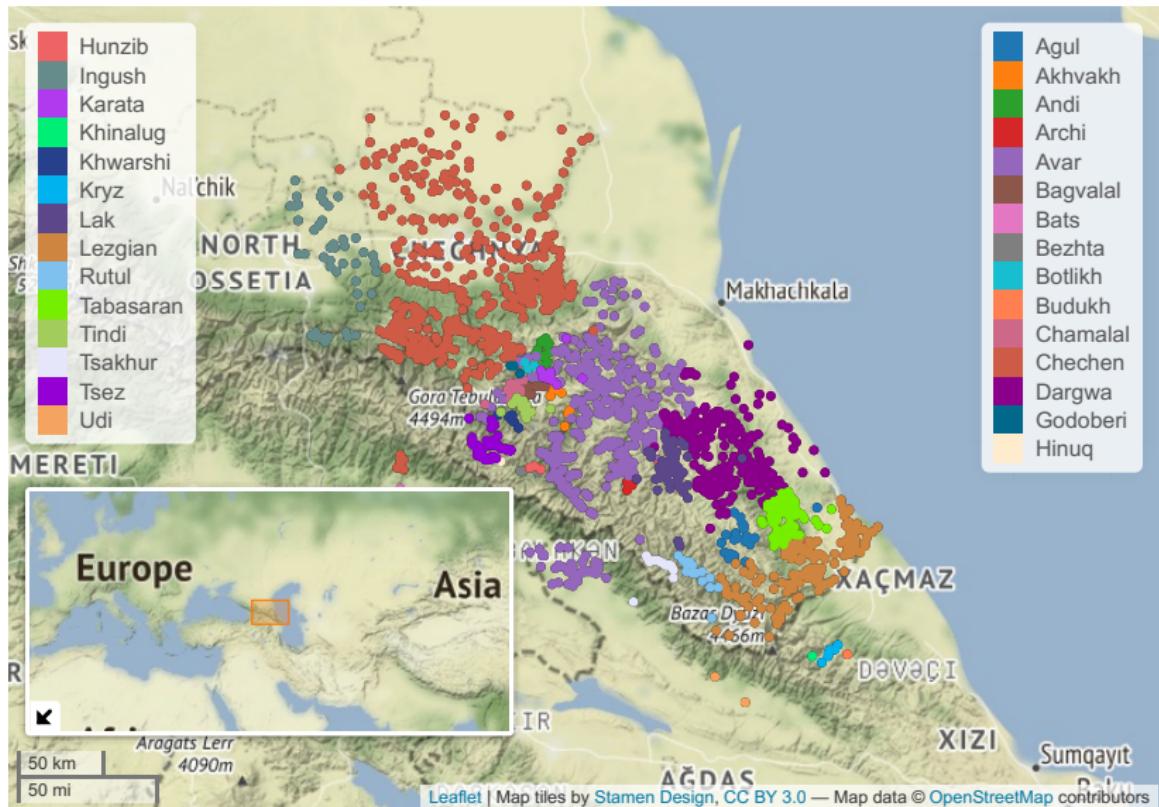
1905 × 9 **table** with the following columns:

- 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 ń |
| Den. | d ڏ | t ڻ | t: tt | t' ڻI | z ڙ | s c | s: cc | | c ڦ | c: ڦڻ | c' ڻI | n ڻ |
| Alv. | | | | | ž ڇ | š ڻ | š: ڻڻ | ڇ ڏڇ | č ڇ | č: ڇڻ | č' ڻI | r p |
| Lat. | | | | | | ł ڻ | ł: ڻڻ | | | ł ڻI | ł' ڻI | l l |
| Pal. | | | | | | | | | | | | j ڻ |
| Vel. | g ڻ | k ڻ | k: kk | k' ڻI | | | x x̥ | | | | | |
| Uv. | | q x̥ | | q' ڻI | v g̥ | χ x | χ: xx | | | | | |
| Ph. | | | | | f rI | h xI | | | | | | |

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':, | | | | | | | |
| Uv. | uvular | -gem | | q', q'ʷ | | χ, χʷ | χ, χʷ | qχ, qχʷ | | | |
| | | +gem | | | | χ: | | | | | |
| Ph. | | | | | | | | | | | |

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. | labi | | | | | | | | | |
| | | labial | dental | alveolar | palatal | velar | uvular | pharyngeal | epig | |
| Den. | den | | | | | -lab | +lab | -lab | +lab | -lab |
| | | +v | b | d | | g | g ^w | | | |
| Alv. | plosive | -v | p | t | | k | k ^w | q | q ^w | (?) |
| | alvc | 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 |
| Pal. | pal: | +v | | (ʒ) | (ʒ) | | | | | |
| | affricate | -v | | c | č | | | | | |
| Vel. | ej | | | c' | č' | | | | | |
| | vel: | sonorant | m, w | n, l, r | j | | | | | |
| Uv. | | --- | -- | -- | -- | | | | | |
| | uvular | -gem | | q', q" ^w | | χ, χ ^w | š, š ^w | qχ, qχ ^w | | |
| Ph. | | +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



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Tones ...

▶ ⏸ 🔊 37:24 / 1:30:04



(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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- May be these conclusions could be data driven?

These ways are...

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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

Introduction

Data

Methods

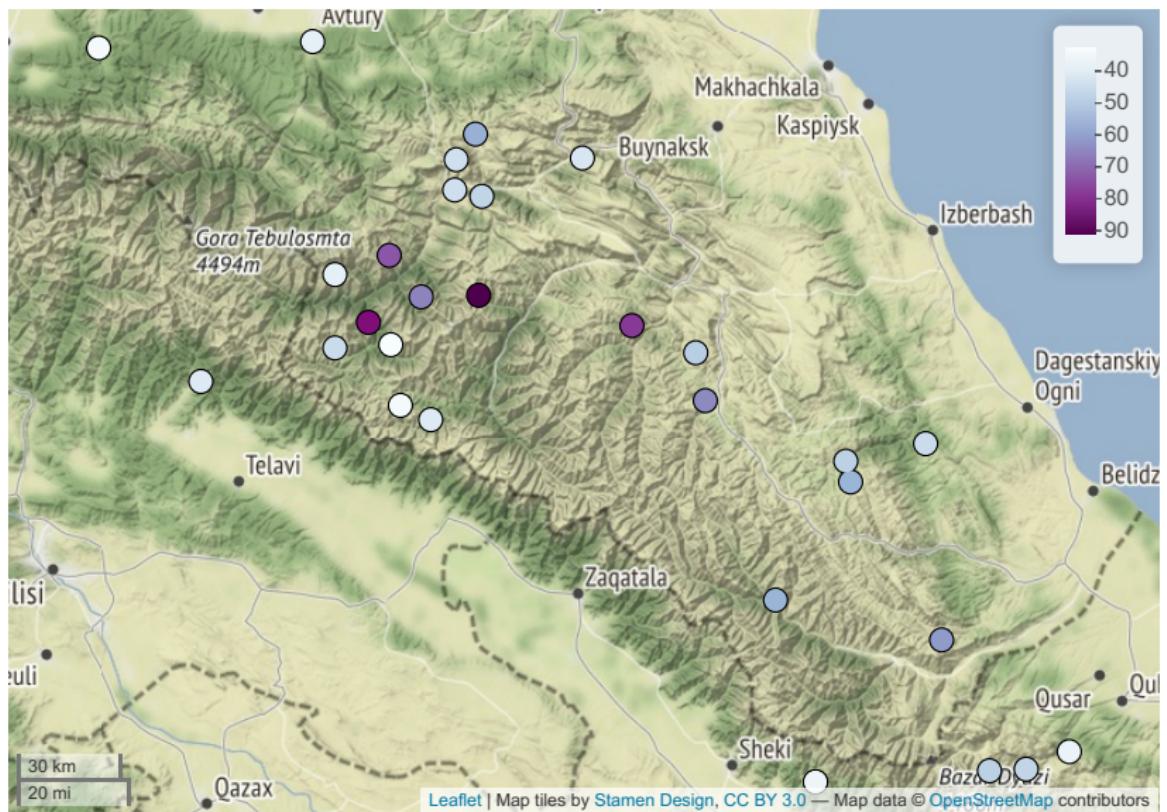
Inventory size

Frequency analysis

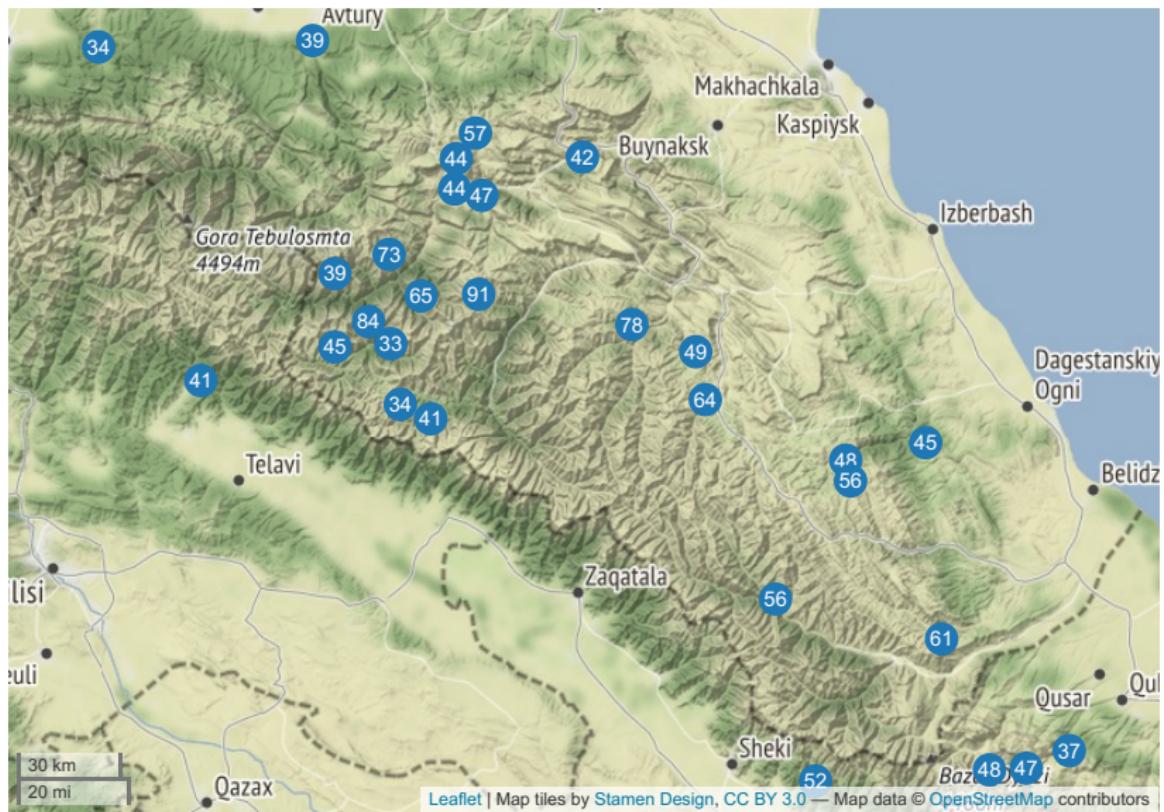
Compare to other databases

Suprasegmental features

Consonants



Consonants



Consonants

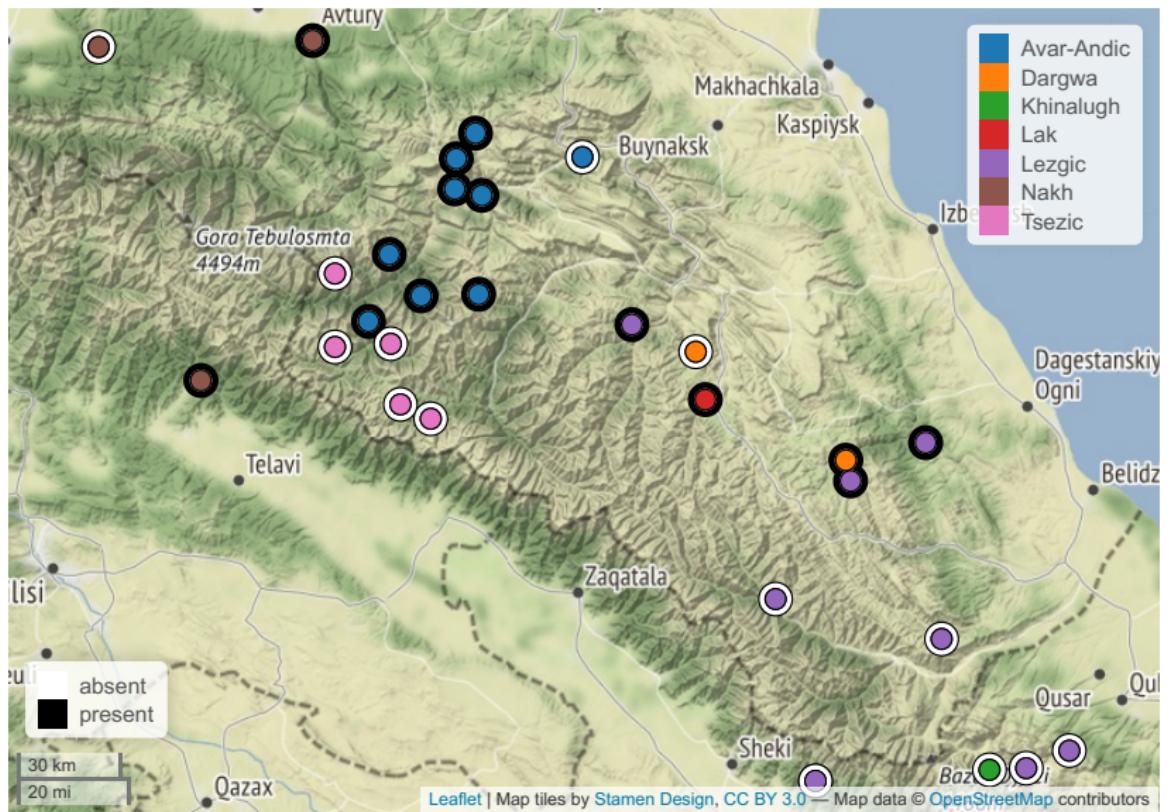
- Akhwakh (Andic) – 91
- Tindi (Andic) – 84
- Chamalal (Andic) – 73
- Archi (Lezgic) – 78
- ...
- Ingush (Nakh) – 34
- Bezhta (Tsezic) – 34
- Inkhoqwari (Tsezic) – 33

Consonants: Akwakh

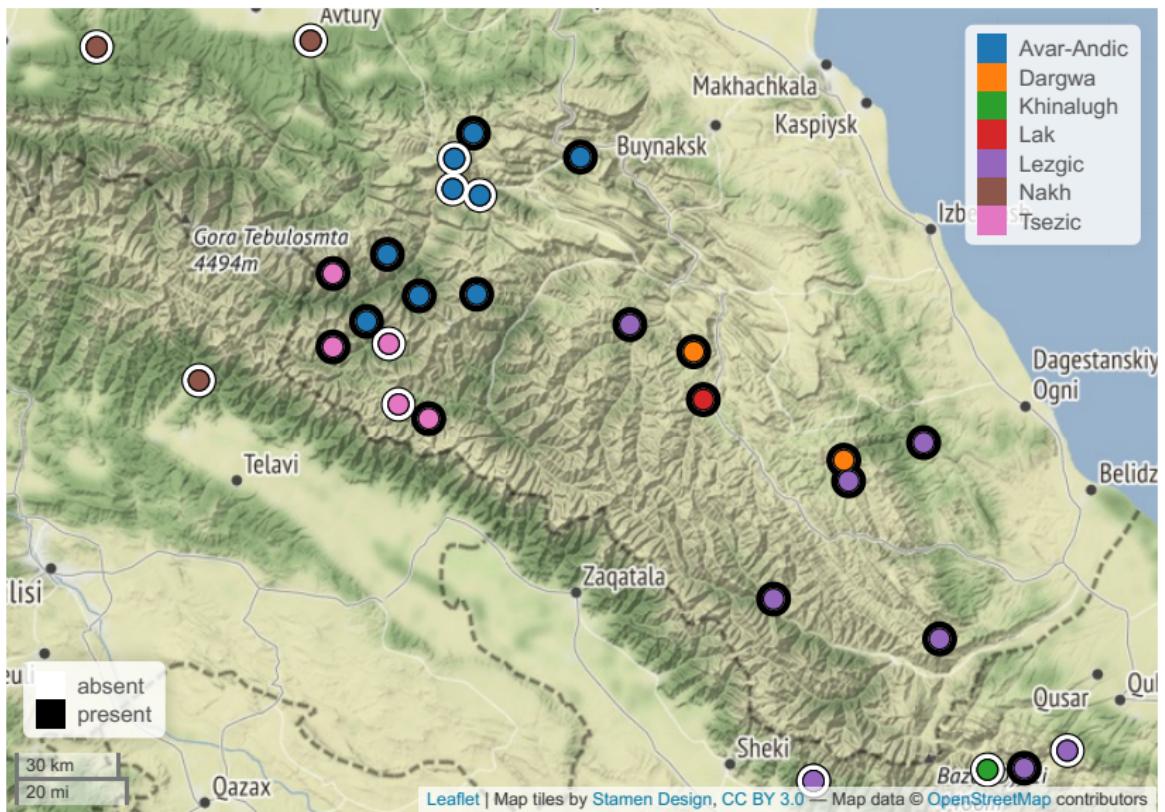
| | | | | | | | | | | | | | |
|----------------|-----------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|----------------|-----------------|----------------|-----------------|---|----------------|
| b | d | | | dʒ | | | | | g | | | | |
| | 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 | | | | | | ʂ | | ç | |
| | | z ^w | | ʒ ^w | | | | | | ʂ ^w | | | |
| | | s | s: | f | f: | ɸ | ɸ: | x | x: | χ | χ: | h | |
| | | s ^w | s: ^w | f ^w | f: ^w | ɸ ^w | ɸ: ^w | x ^w | x: ^w | χ ^w | χ: ^w | | h ^w |
| m | n | | | | | | | | | | | | |
| w | r | | | | | l | | j | | | | | |

- gemenation
- labialization

Geminate consonants



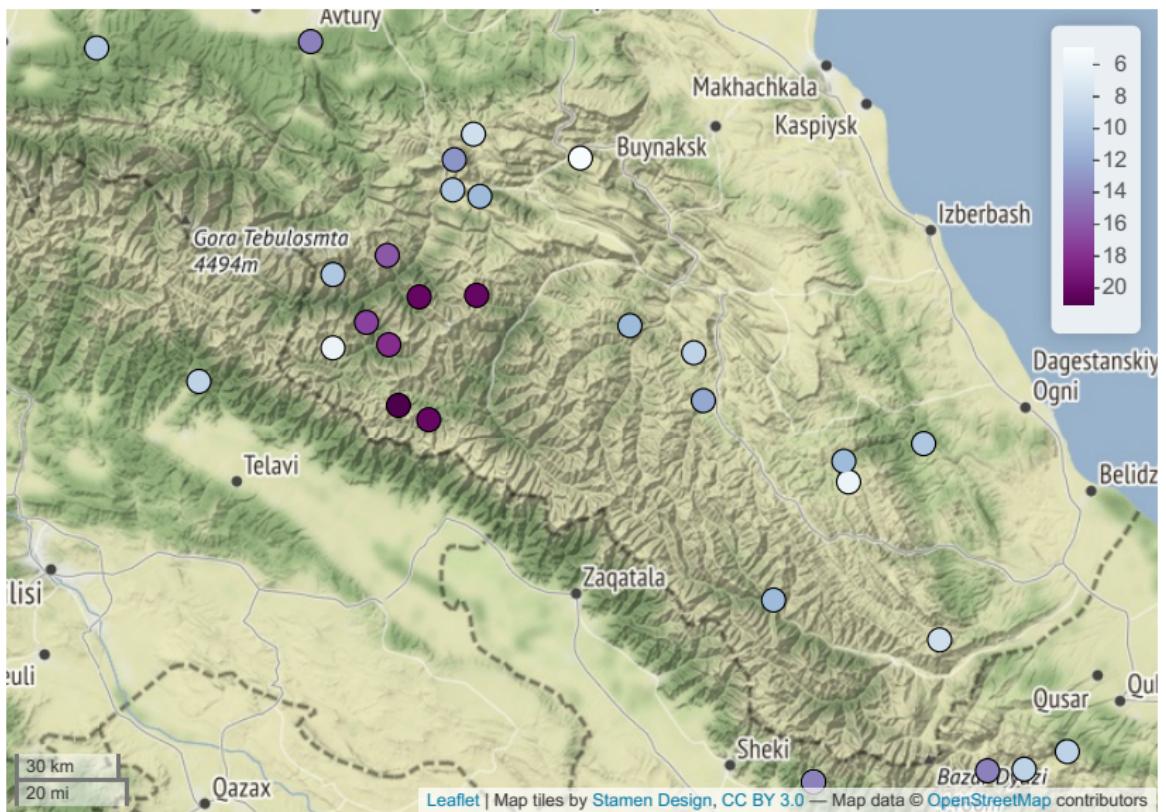
Labialised consonants



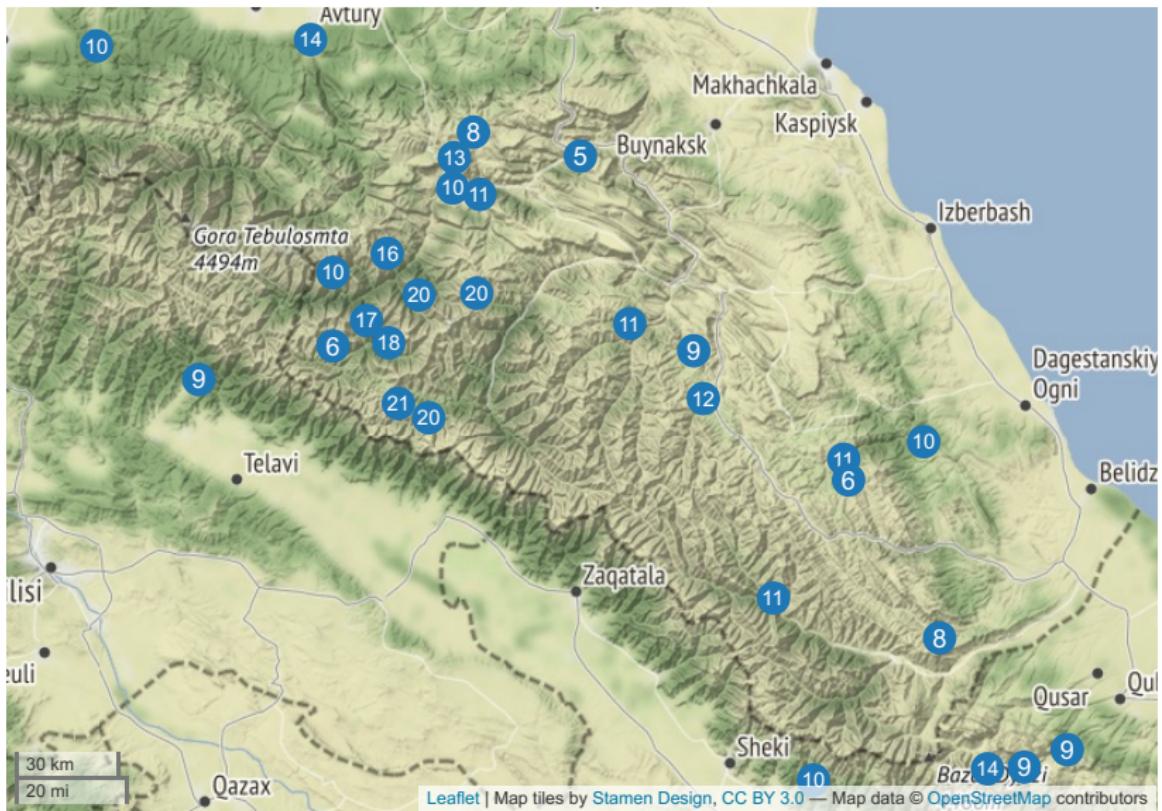
Consonants: Inkhoqwari

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

Vowels



Vowels



Vowels

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

Vowels

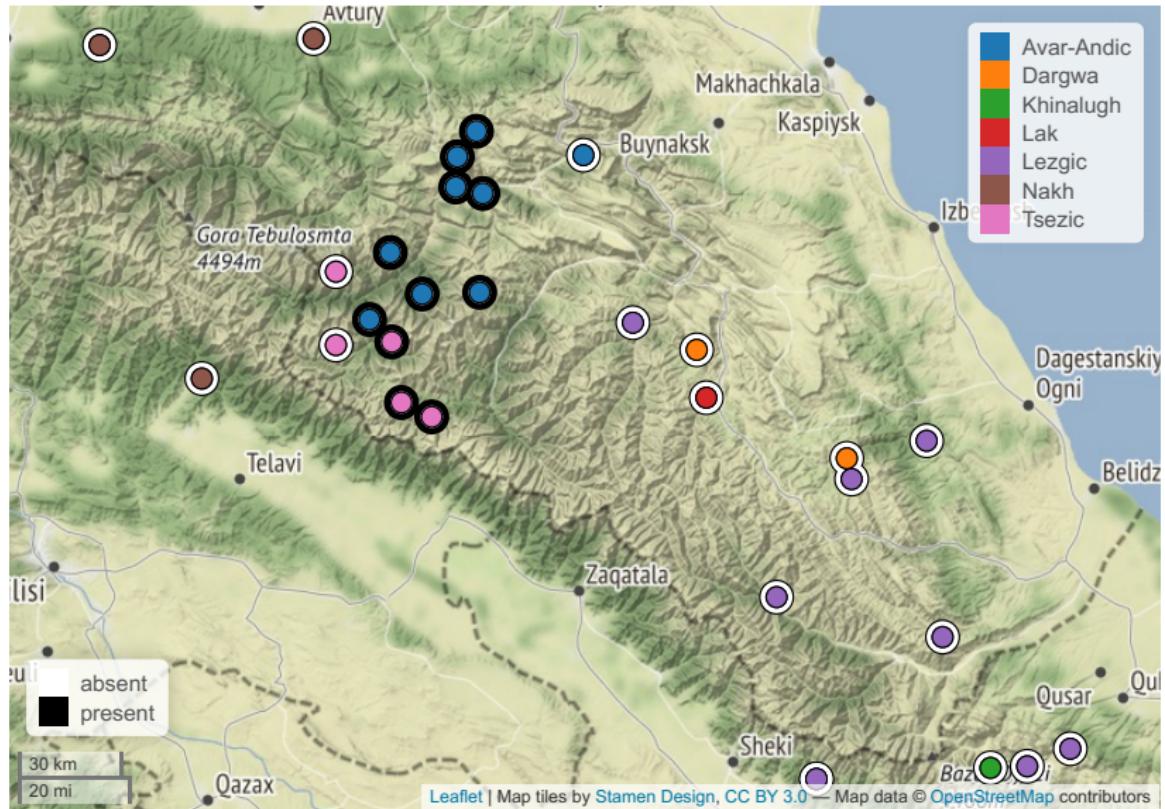
- Bezhta

| | | | | | | | | | | |
|---|----|----------------|---|----------------|---|----|----------------|---|----|----------------|
| 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

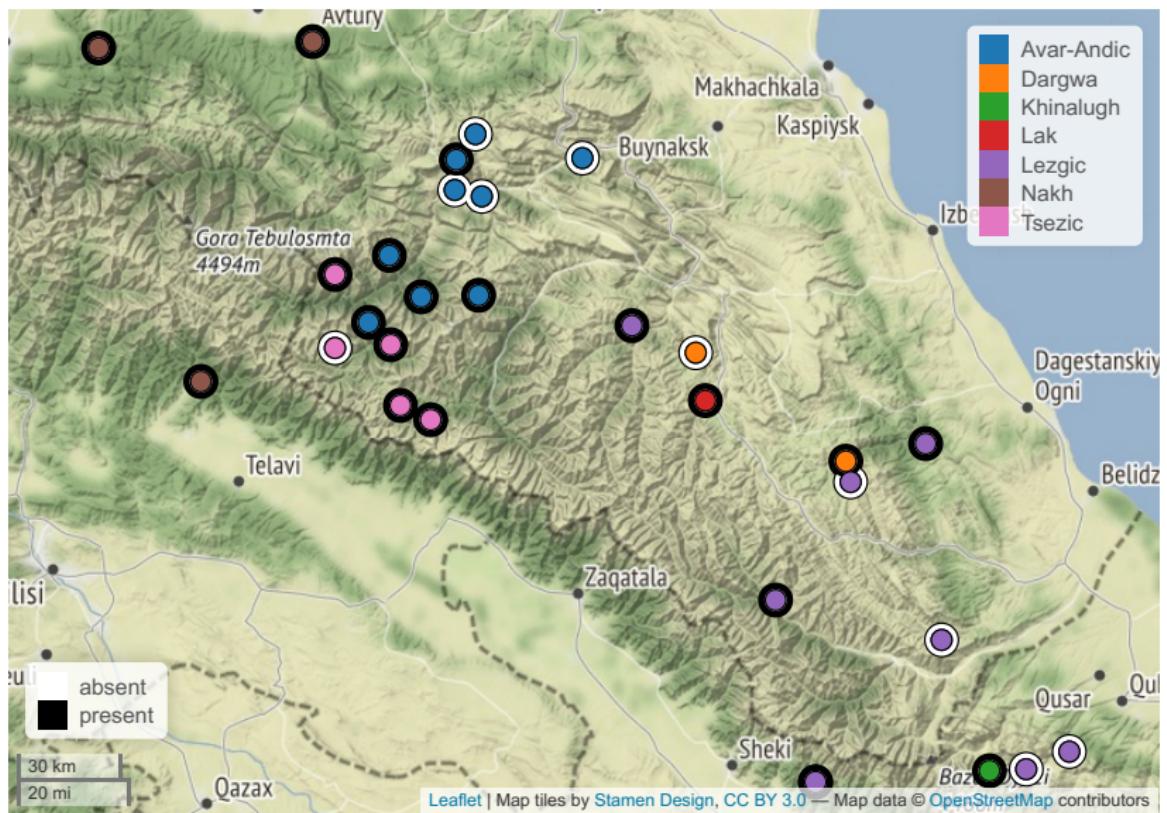
| | | |
|---|---|---|
| i | | u |
| e | | o |
| | a | |

Nasal vowels

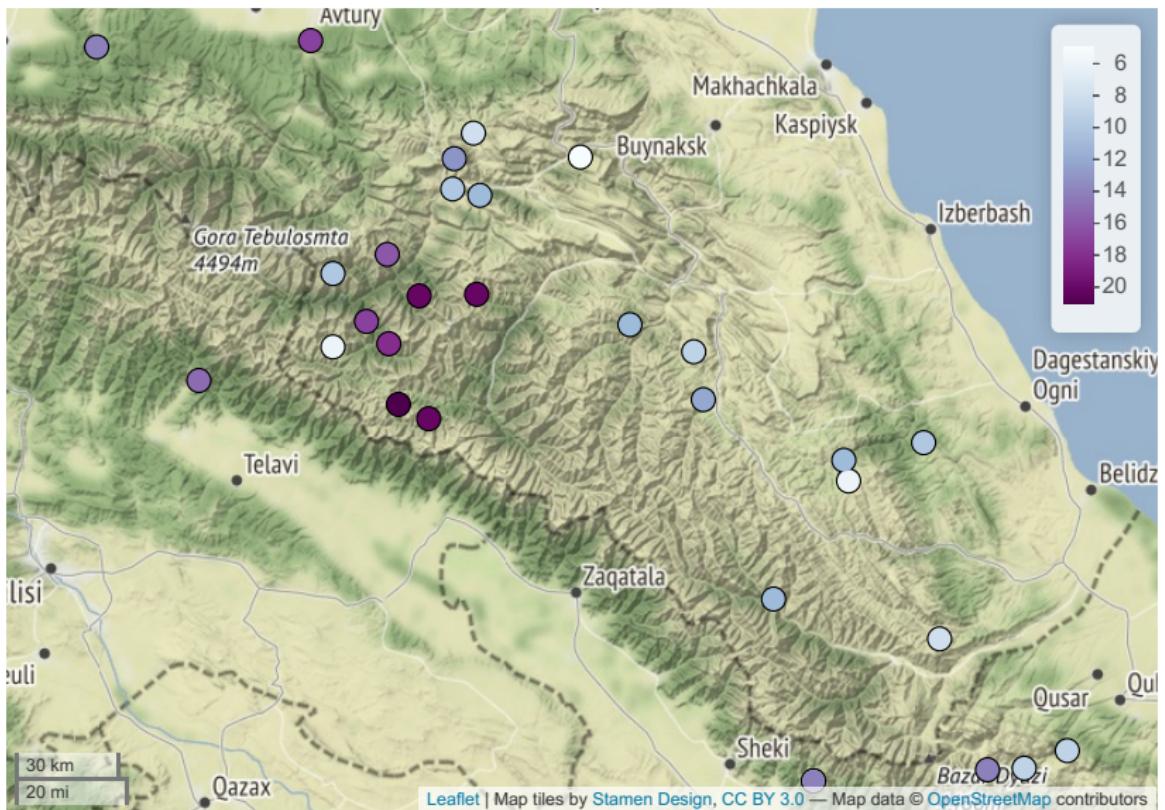


According to our data Avar, Hinuq, and Tsez don't have nasalized vowels.

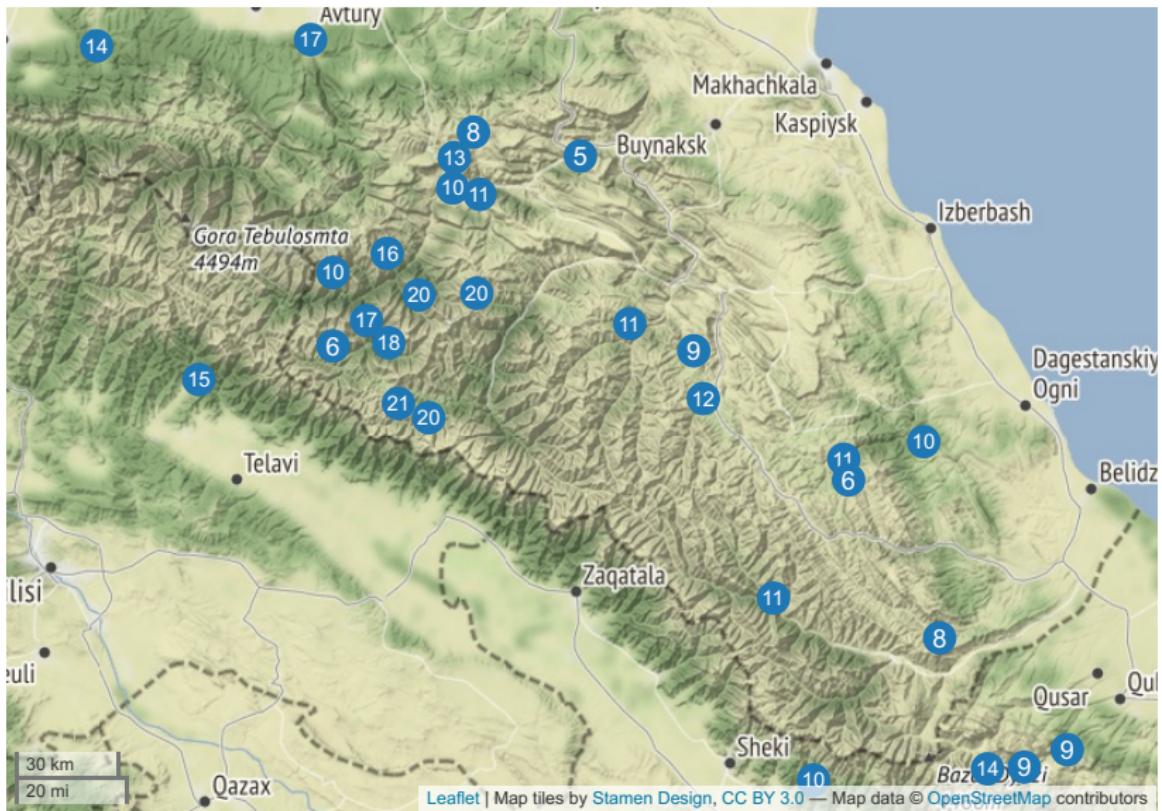
Long vowels



Vowels + diphthongs



Vowels + diphthongs



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Suprasegmental features

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?

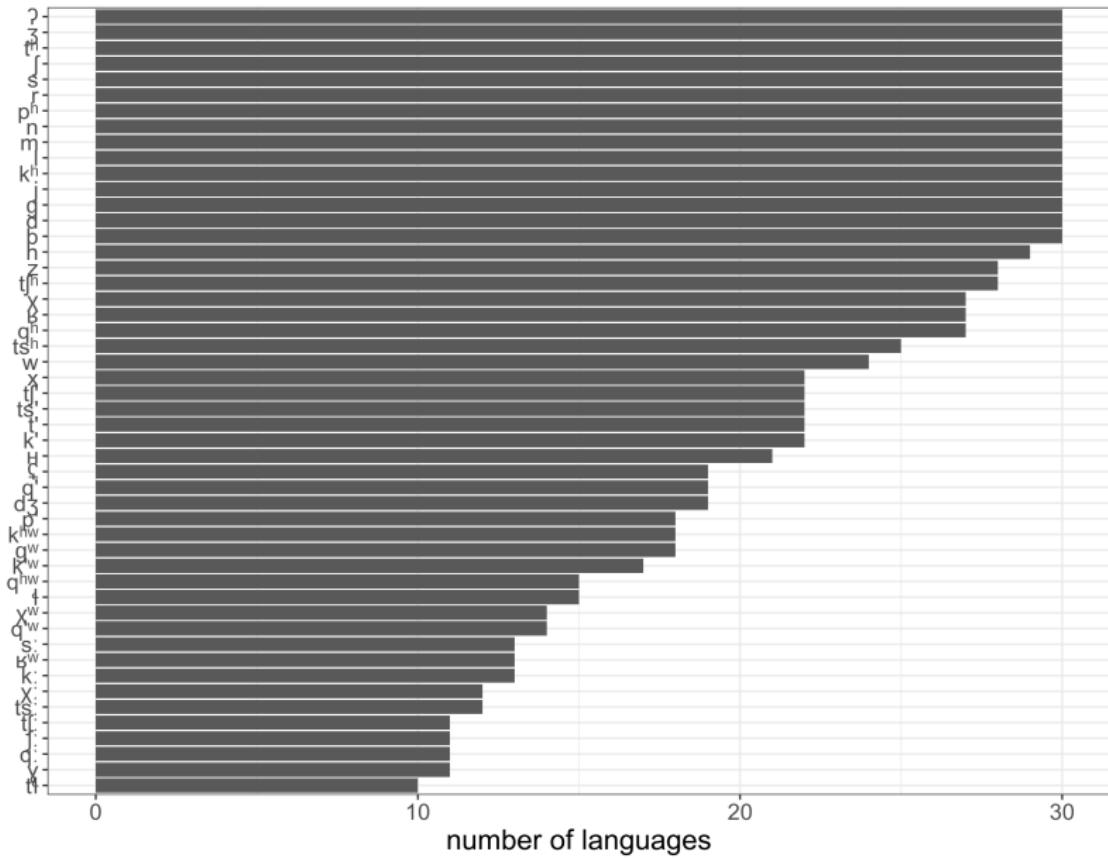
Segments present in all languages

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

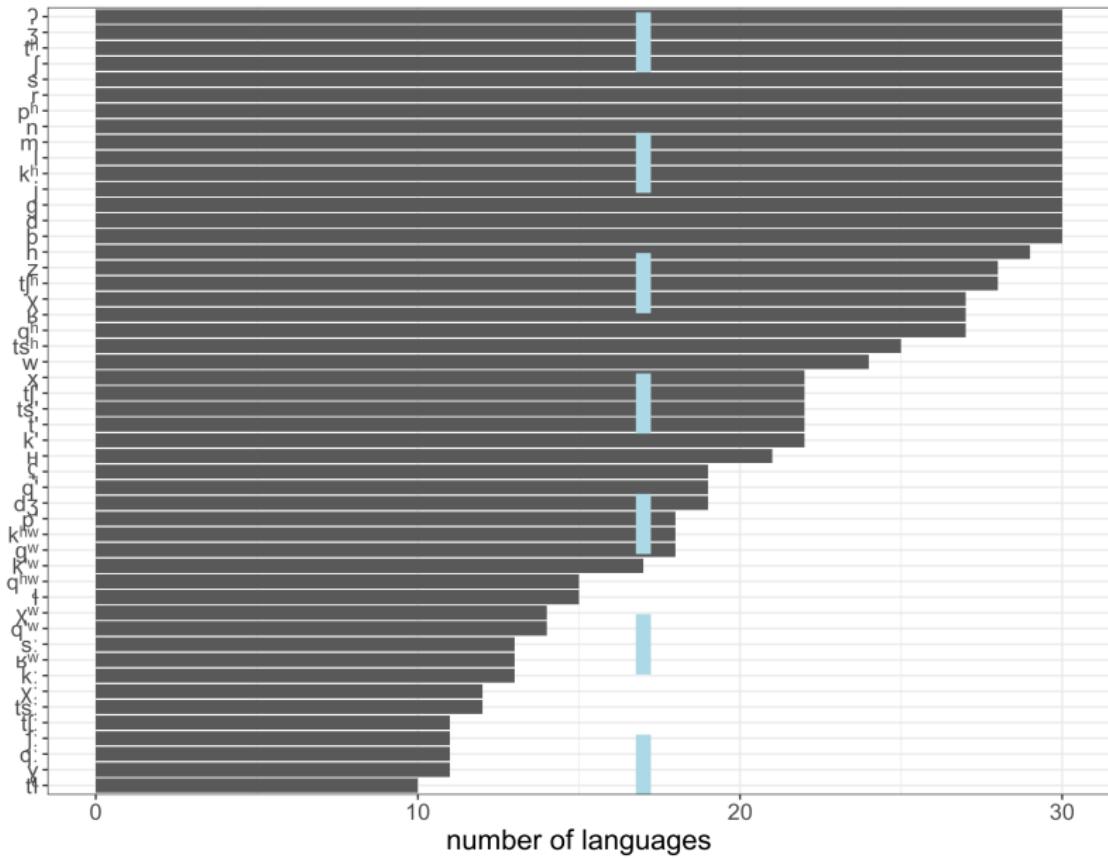
- Where are the famous ejectives? Udi:

| | | | | | | | |
|----------------|----------------|-----------------|-----------------|---|---|----------------|----------------|
| 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

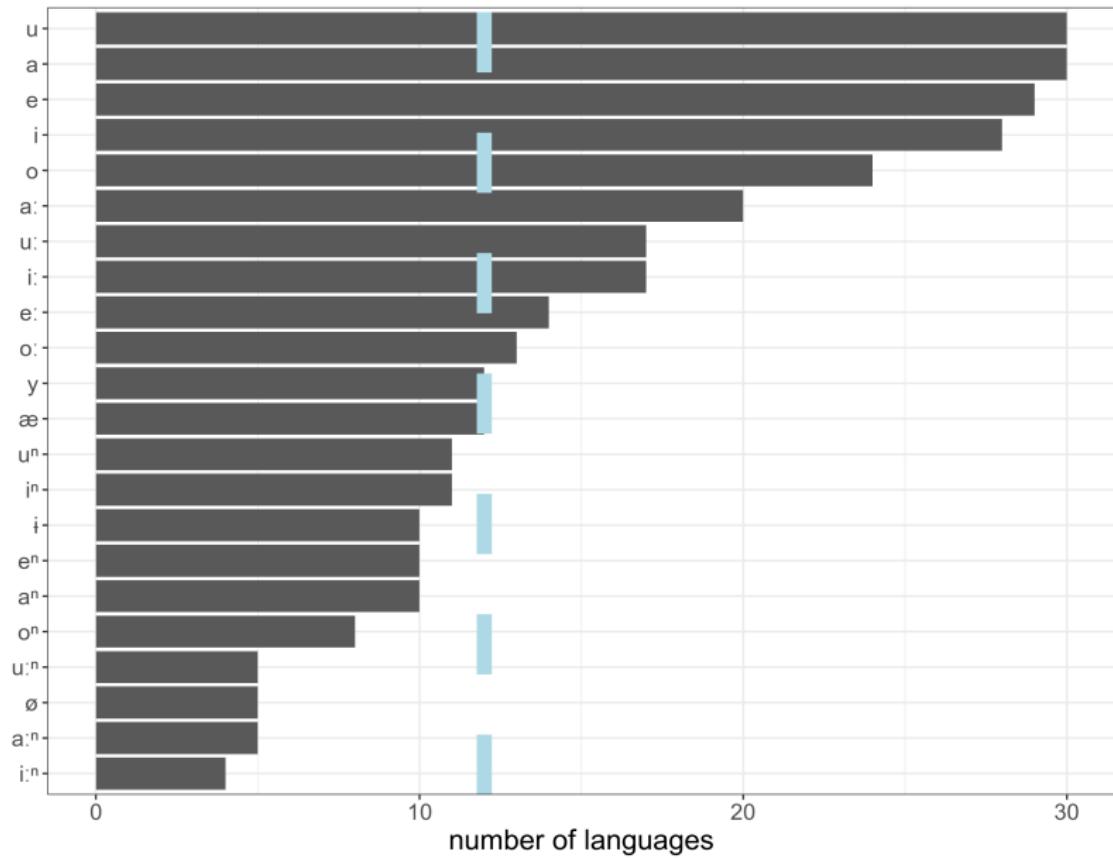


Consonants: typical inventory

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

Outline of the talk

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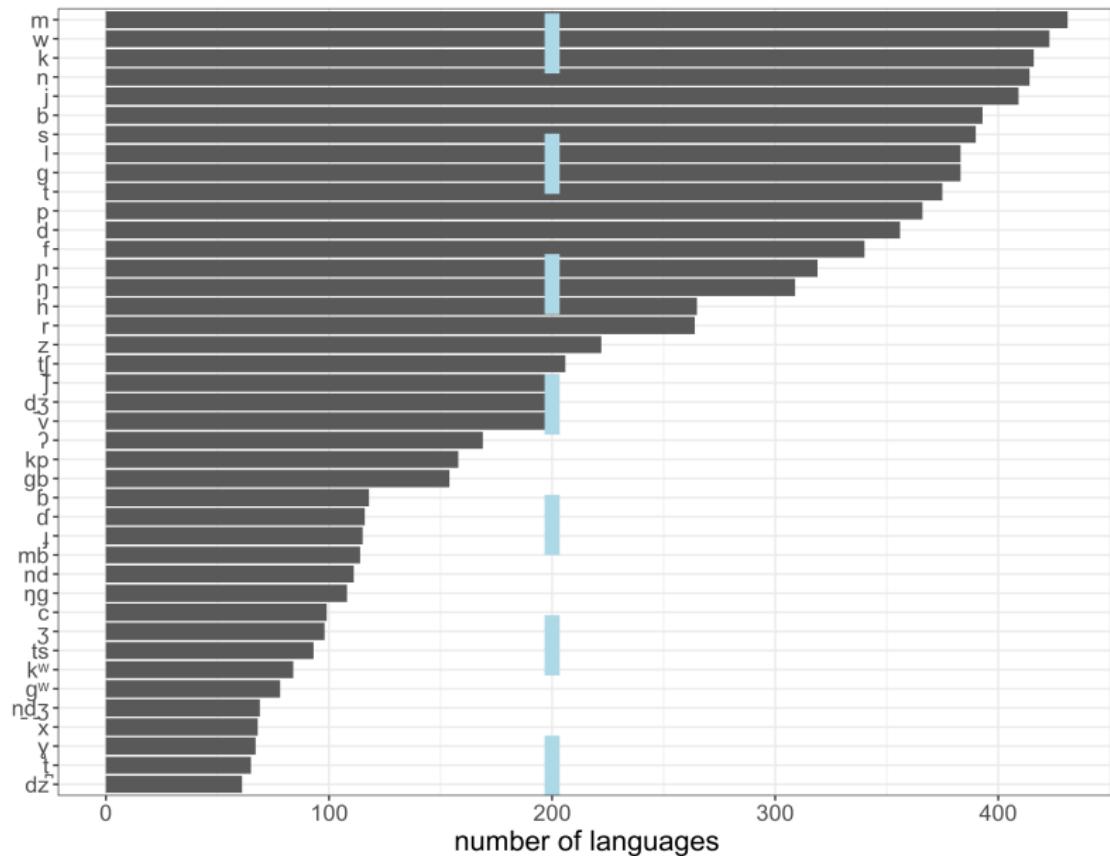
Inventory size

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Compare to other databases

Suprasegmental features

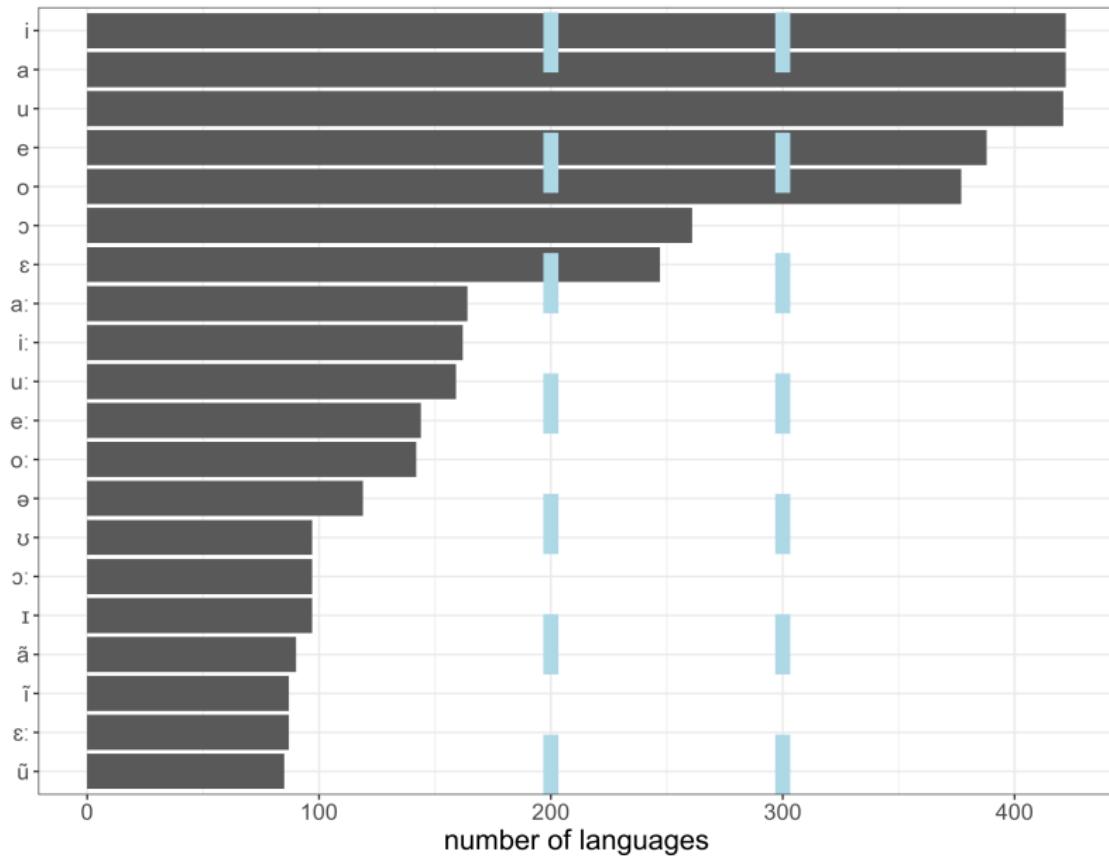
PHOIBLE [Moran and McCloy 2019]: consonants



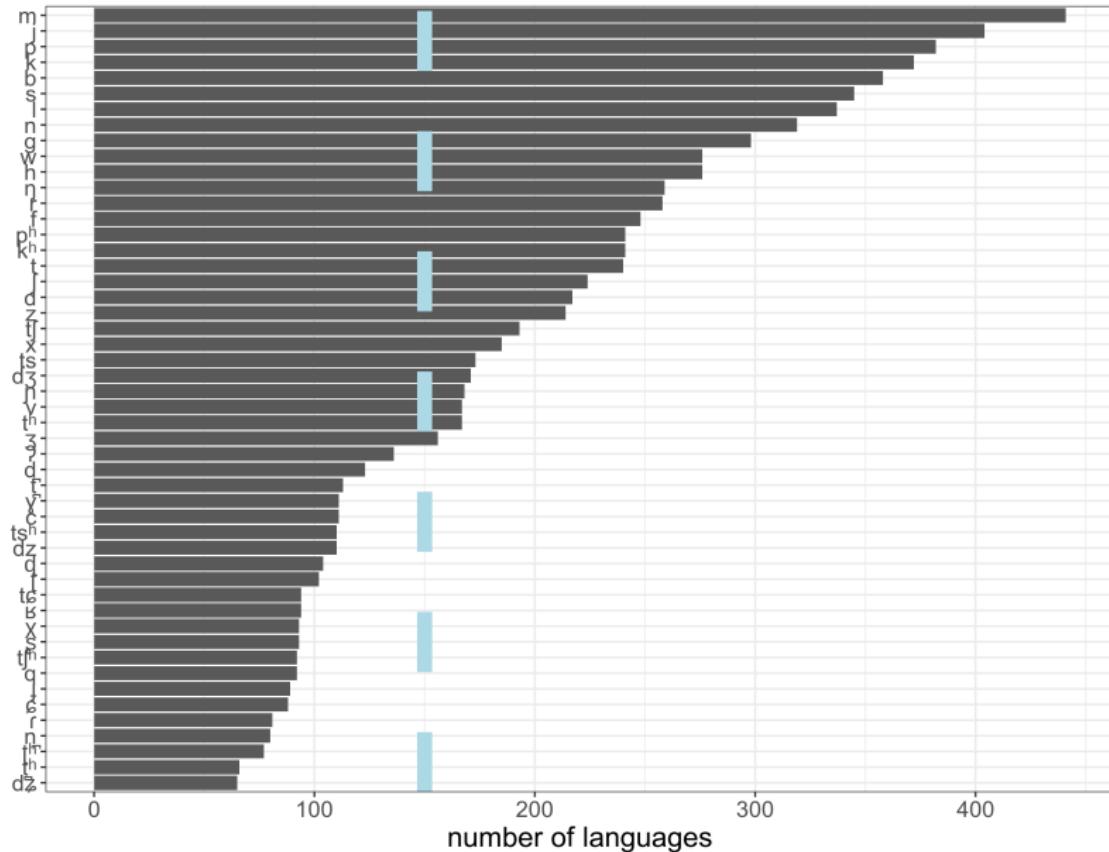
PHOIBLE [Moran and McCloy 2019]: consonants

| | | | | | | | |
|---|---|---|----|---|----|----|---|
| 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



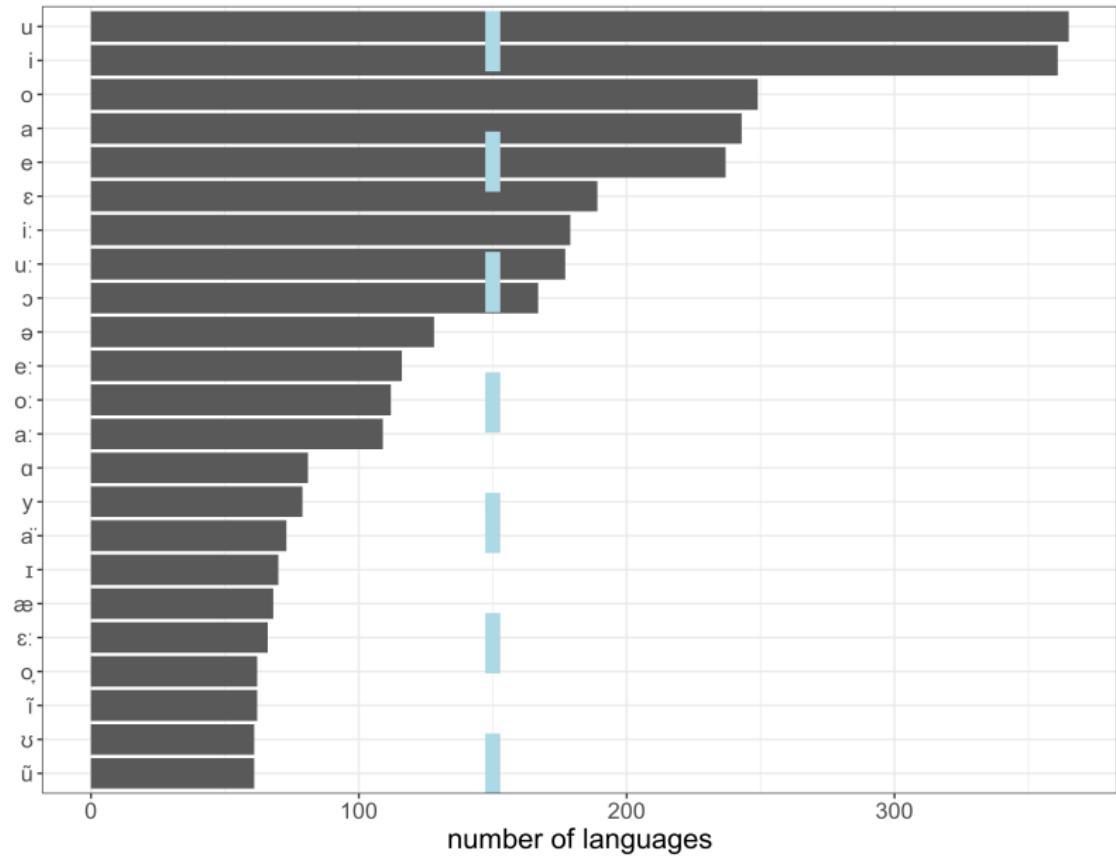
Eurasian phonological inventories [Nikolaev et al. 2015]: consonants



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



Comparison

Outline of the talk

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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 – mystirius feature (absent only 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

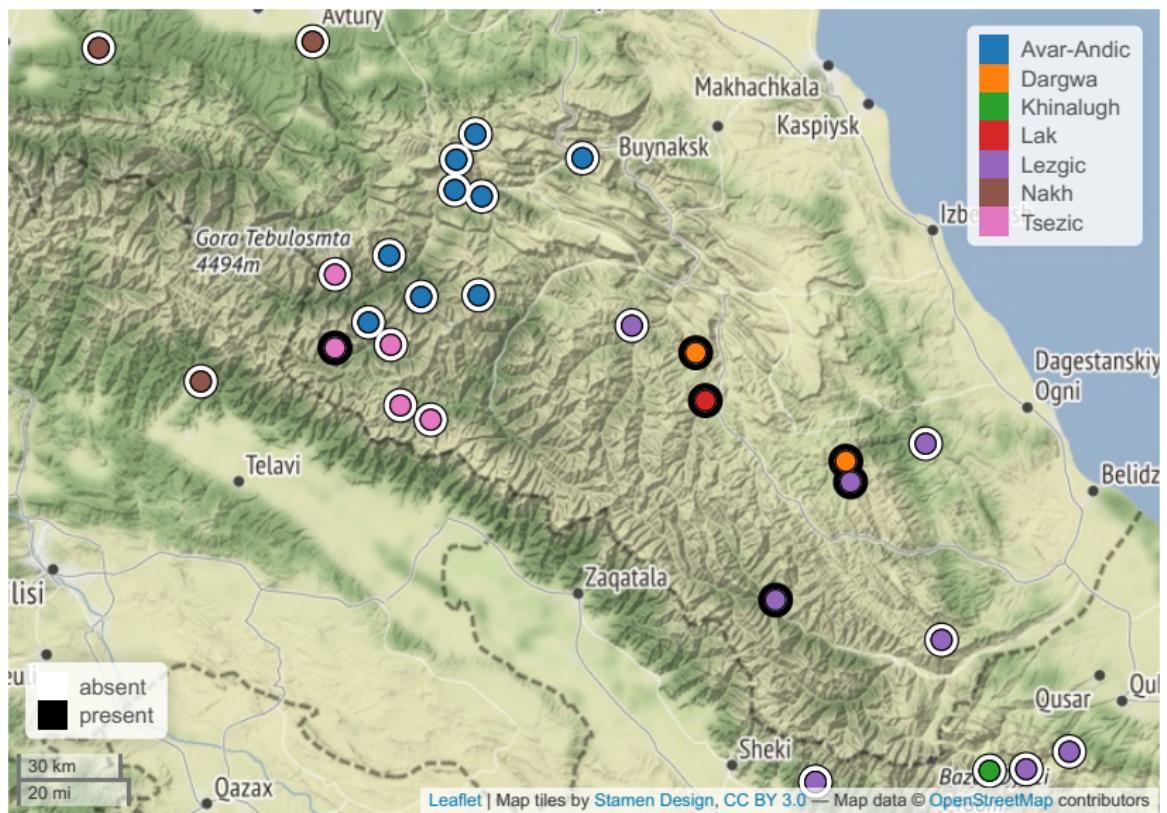
‘does not gather them’

ħa^f-d-irʔ-a^fn

neg-npl-freeze:ipfv-hab

‘they are not freezing’

Pharyngealization



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

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

References

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