

PHARYNGEAL FEATURES IN THE DAGHESTAN LANGUAGES

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ABSTRACT

The phonetic data of the Daghestan languages give evidence of the inadequacy of the present views on articulatory possibilities of the pharynx. Apart from the articulations produced in the pharynx by the movement of the tongue body (the uvulars X, R, q) and of the epiglottis (the epiglottals ħ, ɣ, ʕ) there exist articulations produced by sphincteric narrowing of the pharynx itself. Such is the mechanism of producing a secondary feature called "pharyngealization" and of pharyngeals proper X, R. Structural regularities concerning pharyngeal features in the Daghestan languages are examined in this paper.

PHARYNGEAL ARTICULATIONS IN DAGHESTAN

The Daghestan languages are highly active in using pharyngeal articulations and their data prove the incompleteness of the traditional nomenclature for this region of the vocal tract [1], [2]. Three series of consonants are found in the Daghestan languages: the uvulars, epiglottals and pharyngeals proper (s. Figure 1). In addition, they possess two secondary features: epiglottalization and pharyngealization.

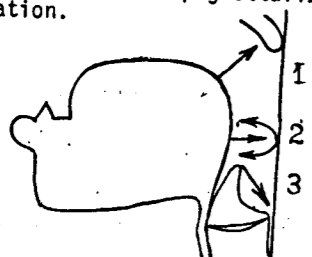


Figure 1. Places of articulation in pharynx:
1 - uvular, 2 - pharyngeal, 3 - epiglottal.

The term "uvulars" indicates the localization of a stricture in the upper-pharyngeal region, but not an active articulator. The articulations of q-, X- and R- like sounds are produced by the backward-upward movement of the tongue-body. The uvula does not play an active role - it is either pressed to the posterior pharyngeal wall (plosives) [3], or may optionally vibrate (spirants). The Daghestan uvulars are similar to the corresponding consonants of Arabic and of some other languages [4]. There are slight differences among languages in the backness of the localization of the stricture but the basic mechanism of its production remains the same. The Daghestan ħ- and ɣ- like consonants do not differ from the corresponding Arabic sounds auditorily.

Our fiberoptic data [5] show that the Daghestan ħ and ɣ are produced in a manner identical with that found by Laufer and Conday [6] for the ħ and ʕ of Hebrew: we observed the backward-downward movement of upper edge of the epiglottis to the posterior pharyngeal wall. Laufer and Conday explained the displacement of the epiglottis by the contraction of the aryepiglotticus and thyroepiglotticus. At the same time, El-Halees [7] considers that the movement of the epiglottis is a mechanical consequence of the larynx rising (this articulatory parameter for ħ, ɣ was assumed already by Troubetzkoy [8]). In any case, the term "epiglottals" seems the most appropriate for these sounds: it is used already by Soviet Arabists [9] and is conceptually close to Troubetzkoy's term 'emphatic laryngeals'. It should be mentioned that, contrary to the widespread opinion, the tongue does not participate in the production of ħ and ɣ: these sounds may be just as well pronounced with the tongue put out of the mouth.

There is a number of allophonic variants of the epiglottal phonemes in the Daghestan languages, these allophones form two series which differ in the extent of the epiglottis displacement from the neutral position (epiglottalization) (see Table 1).

Table 1. Epiglottal consonants

1. Moderate epiglottalization	ʔ	ʕ	ħ/ħ̣
2. Strong epiglottalization	ʕ̣	ɣ̣	H

The sounds of the first series are formed by the super-imposition of moderate epiglottalization on glottal postures for the "plain" laryngeals: ʔ - epiglottalized glottal stop, ħ/ħ̣ - epiglottalized aspiration (unvoiced/voiced), ʕ - epiglottal approximant (the vocal cords are in the position of "spontaneous voicing").

The basic articulatory component for the sounds of the second series is strong tilting of the epiglottis, the function of glottal articulations being identical with the function of phonation for oral consonants: ʕ̣ - epiglottal stop (the closure between the epiglottis and the pharyngeal wall or the apex of the arytenoids, accompanied with the glottal closure), ɣ̣ - voiced spirant, H - unvoiced spirant. In the majority of the Daghestan languages we find two epiglottal phonemes, in "broad" transcription we use for them the signs ħ and ɣ accepted by the IPA. Here are examples of their allophonic realization: /ħ/=[H], /ɣ/=[ɣ̣] (Awar); /ħ/=[ħ̣], /ɣ/=[ɣ̣] (Archi); /ħ/=[ħ̣], /ɣ/=[ɣ̣] (Dargi); /ħ/=[ħ̣], /ɣ/=[ɣ̣] (Lezgi).

/ɣ/=[ħ̣] (Lezgi). We have found similar variants in our pilot-study of the epiglottals ʕ and ɣ in Arabic dialects (cf. [10]). But there exist languages possessing three epiglottal phonemes (some Agul dialects and Budukh), in these languages the third member is the epiglottal stop /ʔ/.

Epiglottalization may function not only as the basic component of the epiglottal phonemes but also as a secondary (usually prosodic) feature. Troubetzkoy [8] described this feature as "emphatic palatalization". This designation is connected with the fact that the epiglottis displacement is usually accompanied by the larynx raising and the forward movement of the whole tongue. But the main parameter of the feature (about the relation of the notions "feature" and "parameter" see [11], [12]) is the narrowing of the lower-pharyngeal passage. A number of the Daghestan languages know another secondary feature resembling epiglottalization but easily distinguishable from it perceptually. This feature is usually called "pharyngealization" by the scholars studying these languages. Our preliminary investigation of articulatory correlates of this feature by means of fiber-optic technique has yielded the following results. We observed the inward movement of the posterior and lateral pharyngeal walls accompanied by the backward movement of the tongue root together with the epiglottis which led to the narrowing of the pharyngeal passage (see Figure 2). This articulation is probably caused by

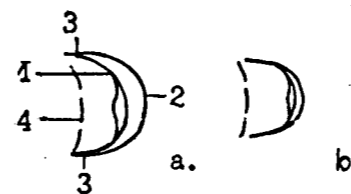


Figure 2. Articulatory mechanisms of pharyngealization

a. Non-pharyngealized [a], b. Pharyngealized [a].
1 - epiglottis, 2 - posterior pharyngeal wall, 3 - lateral pharyngeal walls, 4 - tongue root.

the contraction of the pharyngeal sphincters (the middle and inferior constrictors). The radiographic investigations of pharyngealization [3, 13] have revealed only a backward movement of the tongue, yet we believe that the main articulatory parameter is the circular narrowing of the pharyngeal tube invisible on radiographic tracings. For this feature the term "pharyngealization" seems to be appropriate: it indicates that the pharynx proper is in this case an active articulator. Pharyngealization is usually a prosody, but in some languages it should apparently be considered as a consonantal feature (see below). There exist also the pharyngeal spirants X, R, they relate to the epiglottals ħ, ɣ in the same way as pharyngealization relates to epiglottalization. The backward movement of the tongue body seems to be the invariable component of Daghestan pharyngealization but the precise direction of this movement (back or down-back) and the configuration of the tongue blade are unknown. Cross-linguistic differences in timbre colouring of pharyngealization are indicative for the nonidentity of the parameters

mentioned. In the majority of the languages (Tabasaran, Tsakhur, etc.) pharyngealization has the palatal timbre, but it is not the usual palatalization. It seems to be caused by a sort of deformation of the tongue: the bulk of the tongue moves back and down, whereas the tongue blade moves back and up (to the palatum). However, there are languages that combine pharyngealization with velarization (Archi [14], Udi). This kind of pharyngealization resembles auditorily retroflexivization (particularly, ʔ- coloured sounds of American English).

Epiglottalization and pharyngealization do not contrast, they are supplementarily distributed among languages (or dialects) or sometimes among different consonants of the same language. The common origin of both features is apparent, the initial form being epiglottalization. Further on for the this family of features a cover-term "pharyngeal stricture" (PS) will be used.

In some Daghestan languages (Lack, Dargi) both epiglottalization and pharyngealization participate in the production of the pharyngeal stricture equally. For this variety of PS the term "epiglottopharyngealization" is used here. Epiglottopharyngealization shares with epiglottalization the palatalizing influence on consonants (especially, on velars) as well as on back vowels. The widening influence of the epiglottal component on narrow vowels is also typical: [i] approximates to [e] and [u] approximates to [ö]. The PS features also contain a slight nasal component.

We mark the PS features by a vertical bar (a|, q|), yet in the "narrow" transcription epiglottalization is marked by a crossed vertical bar (a‡, q‡).

LINGUISTIC FUNCTIONING OF PHARYNGEAL FEATURES

1. All twenty six languages of Daghestan have uvulars as a part of their phonological systems and all basic phonemic contrasts are found in the consonants of this series: all phonation types (voiced/unvoiced/aspirated/ejective), strength, labialization, palatalization.

The epiglottals ħ and ɣ are also found in the majority of the Daghestan languages, in some languages they have the labialised pairs. There is a close connection between the type of PS and the history of the epiglottals in a language given. The old epiglottals are lost if PS has a form of "pure" pharyngealization - they are replaced with the corresponding plain laryngeals, the epiglottal component being reflected by pharyngealization (Archi) or by umlaut of the adjacent vowels (Tsakhur, Tabasaran). The new epiglottals in loan-words may remain (Archi) or be again deepiglottalized. For instance, in Tsakhur ħ → h| and ɣ → ɣ|: h| + |ʔ| = |ʔ|, a|t| dɪ = spute, ?|a|r|a|b|a| araba.

In the languages which possess the mixed (epiglottopharyngeal) form of PS (Lack, Rutul) [ħ̣] and [ɣ̣] represent /ħ/ and /ɣ/ in the PS context. In the south dialects of Dargi such sounds may be found in the words both with and without PS. Spirant allophones of ħ and ɣ are typical for the languages which have epiglottalization and the languages without the PS features.

Whereas the old epiglottals are usually (but not always) lost in the languages which have pharyngealization, additional epiglottal spirants arise in

in the languages which have epiglottalization: $X\uparrow \rightarrow \text{h}$, $R\uparrow \rightarrow \text{q}$ (some Tsez and Agul dialects). The transition $q\uparrow \rightarrow \text{t}$ is much more seldom (some Agul dialects).

Finally, there are Agul dialects (the dialects of this language demonstrate surprising diversity in the pharyngeal features development) in which the pharyngealized uvulars have changed into the pharyngeals proper: $X\uparrow \rightarrow \text{X}$, $R\uparrow \rightarrow \text{R}$. There are three series of the post-velar spirants in these dialects: the uvulars (X, R), epiglottals (h , q) and pharyngeals (X , R). Here are some examples from the Richa dialect: Xal house - haC apple - Xaw udder, Rad hammer - qak_w light - Ran belly. In addition, there are new pharyngealized uvulars in this dialect: X|a|w rut, R|a|b stack. It may be the most abundant system of postvelar spirants in the world languages. 2. Now let us consider linguistic behaviour of the PS features. In the majority of the Daghestan languages they reveal apparent prosodic properties: they tend to spread about the whole word. Here are examples from Archi: b|a|k'|o|n rope, k'|e|h|u| hawk; an example from North Tabasaran: $\text{g|a|r|a|w|R|u|nu|za|}$ growled. As a rule the degree of PS diminish from the beginning to the end of the word. Consonants of the different local series differ as to their ability to join the PS features and to pass them onto next segments. The uvulars and laryngeals are the best to coarticulate with PS. They show a tendency to have the highest degree of this feature and may disturb the typical descending pattern. Some languages (e.g. Rutul) have PS only in the syllables which contain uvulars or laryngeals. This feature is naturally treated there as consonantal.

On the contrary, the dentals do not coarticulate with PS and may prevent the spreading of this feature from the preceding to the next vowel: x|u|m|u|sa liquid (Lack). As to the labials, hushing sibilants, laterals and velars, they are "transparent": they easily join PS and pass it to the next segments.

All the forms of PS can easily combine with the labialized consonants. Here are examples from Tsez: $\text{R}_w\text{t}|\text{a}|\text{t}|\text{j}$ dog, $\text{q}_w\text{t}|\text{a}|\text{t}|\text{j}$ ankle; examples from Archi: $\text{R}_w\text{a}|\text{t}|\text{q}|\text{i}$ smog, $\text{s}_w\text{a}|\text{s}|\text{t}$ last year.

3. A concluding remark: Arabic "pharyngealization" is not identical with any form of PS and, probably, should be treated as a variety of velarization (cf. Troubetzkoy's term "emphatic velarization" [8]). The "emphatic" t , d , s , z , l of Arabic are pronounced with the tongue displaced into the pharyngeal cavity [10]. However, the perceptual results of this movement are not identical to epiglottalization or pharyngealization of the Daghestan languages. It is a significant fact that just the same sounds (dentals) which participate in the "emphaticness" contrast in Arabic do not coarticulate with the PS features in the Daghestan languages.

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