



RESEARCH PAPER

Description and Classification of Balti Segmental (Fricative Sounds) Consonants

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ABSTRACT

The present study attempts to classify consonants (fricative sounds only) of Balti language which is spoken in Baltistan region of Gilgit-Baltistan of Pakistan. The study selects Balti language because it is one of the lesser known languages in Pakistan and no significant work on the sounds and sound system of Balti language has ever been conducted. In order to classify Balti consonants, 120 different words were selected from different Balti books. Acoustic analysis of Balti consonants have been checked in order to show their physical features by using the software PRAAT. To record the samples of different Balti consonant sounds, the researcher selected 20 native Balti speakers between the age group of 16 to 35 studying in the Govt College (boys) Model Town and University of Management and Technology, Lahore Pakistan. The physical features of the sound samples of Balti native speakers were shown in the form of spectrograms for each sound. Acoustic analyses of Balti consonant sounds demonstrate that there are 10 fricatives sounds in Balti language.

Keywords: Acoustic Analysis, Allophonic, Classification, Consonants, Description, Fricatives, Phonemic, Spectrogram

Introduction

The legendary land of Baltistan is hemmed in on all sides by stupendous mountain ranges which stand like white giants of unproportionate height. Nowhere in the world is clustered so many high peak within such a small area as in Baltistan. The history of this area is rich and prosperous because of its cultural, ethical and linguistically richness and prosperity in the past. Most of the people of the area speak Balti language. Balti is a member of Sino-Bodic of the Himalish group which originated from the Tibeto-Burman of Sino-Tibetan family of language which is the second largest family of the world in term of the number of speakers. English and the other European language s belong to this language family. The Sino-Bodic family of languages is link with the most ancient language that is Altaic: Turkic Mongolian and Tunguisc. Balti is a reminiscent of the one of the most ancient civilizations of the *Baot or Bonpo* (the followers of *Bon*) ethnic group and Bon Shamanism religion. Tonpa an influential with strong minded person was the great ruler of the Tibetan mesa at that time and the great Tibet was known as the *Ol-mo Lunring*. *Ol-mo Lung-ring* was situated in the west of Tibet, where Balti was officially religious language and language of trade and commerce and flourished and modified from time to time. At that time the students from the different areas of this part great Tibet (Baltistan) would go to the educational centres or in other words schools for getting education. However, the separation of the great Tibetan empire caused this devastating \process of learning and teaching systems to meet a obnoxious end. The evolutionary period of Tibetan script started from the early seventh century. Song Seen Zghampo (617-650A.D) the then ruler of Tibet sent one of

his ministers *Ano Thonmi Bu (son of tall women)* to India to formulate script and grammar for the Tibetan language. *Thonmi*, also known in the history as Sambota, learnt Sanskrit language from Tamze Li Chun. Sambota came back to Lhasa after learning the writing skills and grammar, and he projected two versions of scripts those are known as Ochan or U chan and Thaik for the Tibetan language using the letters of Sanskrit language. The Thaik version has extinct while Ochan is the existing now and used in writing purpose in Ladakh and its surrounding areas Sambota was considered as the first person who wrote the first ever grammar on Tibetan language, as a result Balti language became very popular Language of that time, but after the arrival of Islam in this region in 14th century A.D the religious relationship of Baltistan was disconnected from other parts of the great Tibet. The people of this region embraced Islam on the hand of Hazrat Ameer Kabeer Syed Ali Hamdani (R.A) and Hazrat Mir Shams-ud-Deen Muhammad Iraqi (R.A) and after separating Islam, the religious terminologies of Bon and Buddhism were replaced by the Islamic terminologies of Persian and Arabic languages. Consequently, the Agay (the original Balti script) became passive in Baltistan region and Persian written script was adopted for writing their poetries and other literary purposes that is continued till today.

Literature Review

If one observes the number of people speaking Balti language and has a cursory look on the size of the geographic region they occupy, we find no special effort on the grammar and phonology has been made and not much is written about this language. The phonology has been slightly discussed. The initial work in this regard is observed in the works of Austen. In 1866, Austen, the famous surveyor of the Karakoram Mountains, became the first European to publish a vocabulary of Balti. Keeping in view the works of Austen, has also included somewhat more precise, though small, vocabulary and some notes on the grammar of both Balti and Purki in Volume III of his book *Linguistic Survey of India*. Bailey added a more detailed grammatical outline and vocabulary of Purki in 1915. In addition to all these contributors in 1934, Red published the most extensive grammar of Balti to date, along with a vocabulary of well over 2,000 words. Some forty years later, Rangan added a phonology and grammar of Purki (Dialect of Balti) in 1979. From the point of view regarding phonetic notation, Rangan's contribution is the most accurate work, as his predecessors were mostly unaware of the nature of certain sounds found in Balti and Purki, particularly the palatal nasal [n] which they variously recorded as [n], [K], [ny], or [Ky] (Backstrom,1992).

H.A Jaschke relates that many words of Balti language were original words derived from the Hindi language therefore; he assumed that many Balti sounds are similar to Hindi language sounds. In the same book he mentioned 30 Balti consonant letters and 4 diacritics symbols for Balti vowel sounds (Jaschke, 1983). Jaschke did not prove these sounds based on scientific way instead; he considered the letters as sound.

Material and Methods

The details of the methodology are given under the relevant sub-headings.

Participants

In order to conduct this particular study the researcher selected 20 native Balti speakers between the age group of 16 to 35 studying in the Govt College (boys) Model Town and University of Management and Technology, Lahore Pakistan.

Procedure

In order to classify Balti consonants, 120 different words were selected from different Balti books. Acoustic analysis of Balti consonants have been checked in order to show their physical features by using the software PRAAT.

Discussion

To describe the place of articulation of each sound, a diagram of every individual sound is made. On the other hand, spectrogram of each sound has also been made which indicates the manner of articulation, i.e., fricatives, voiced, voiceless, aspirated and un-aspirated features of each sound. The voiced sound is also shown in the diagram with the help of this mark (M). Minimal pairs were made to check the existence of different sounds. The observation of researcher has been discussed and the data was analyzed with the help of the diagram and spectrogram mentioned with each sound. Finally, the findings of this study have been mentioned at the end of data analysis.

Analysis

Minimal pairs for /s/ and /z/ sounds

The existence of /s/ and /z/ phonemes in Balti language has been checked through the following minimal pairs.

Minimal pairs	Transcription	Meaning
so	/səʊ/	teeth
zo	/zəʊ/	eat

Findings

The above pairs show that the phoneme /s/ and /z/ exist in Balti language.

Observation on phoneme /s/ of the Balti language by the researcher is shown in

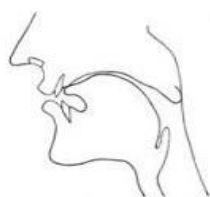


Diagram 1

Table 1

Description of phoneme /s/ in Balti language

IPA symbol	/s/
Place of articulation	Dental
Manner of articulation	Fricatives
Voicing	Voiceless
As-un-aspirated	un-aspirated
Perso-Arabic letter	ث, ص, س

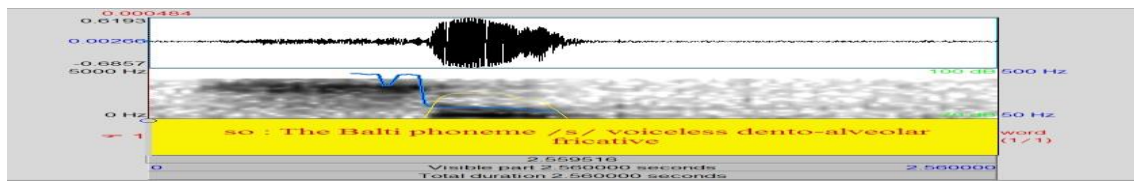
س /s/ (Alveolar fricatives)

Analysis

1. The phoneme /s/ is a voiceless alveolar fricative sound in Balti language. In the articulation of this phoneme the tip of the tongue rises towards the alveolar ridge as shown in the diagram 1. The tip as well as the blade of the tongue is very close to the alveolar ridge and the air comes outwards between the tip of tongue and alveolar ridge followed by very narrow release, where the friction made is shown in the

spectrogram 1. Moreover, no vibration has been noted during acoustic analysis through Praat . Therefore, the phoneme /s/ is a voiceless sound.

The Balti phoneme /s/



Observation on phoneme /z/ of the Balti language by the researcher is shown in in:

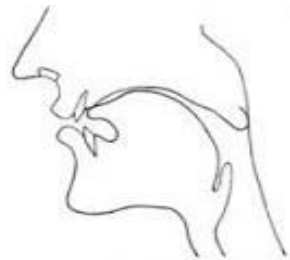


Diagram 2

Table 2

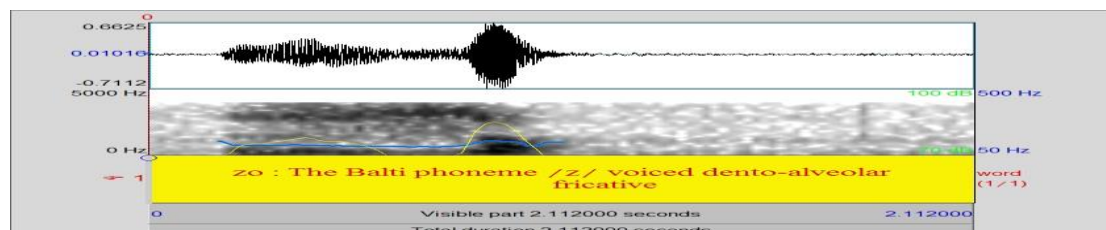
Description of phoneme /z/ in Balti language

IPA symbol	/z/
Place of articulation	Alveolar
Manner of articulation	Fricatives
Voicing	Voiced
As-un-aspirated	un-aspirated
Perso-Arabic letter	ض, ظ, ز

/z/ (Voiced alveolar fricatives)

Analysis

- The phoneme /z/ is a voiced alveolar fricative sound in Balti language. In the articulation of this sound, the tip of the tongue rises towards the alveolar ridge as shown in the diagram 2. The air comes outwards between the tip of tongue and alveolar ridge followed by very narrow release with a strong friction shown in spectrogram 2. A strong vibration has been observed during acoustic analysis of this sound through Praat shown in the spectrogram 2. Therefore, this is a voiced sound.



The spectrogram 2 The Balti phoneme /z /

Minimal pairs for /f / and /z / sounds

The existence of phonemes /ʃ/ and /ʒ/ in Balti language has been checked through the following minimal pairs.

Minimal pairs	Transcription	Meaning
shing	/ʃɪŋ/	meat
jeing	/ʒɪŋ/	filed
shu	/ʃu/	small water channel
Ju	/ʒu/	yes (respectfully)

Finding

The above pairs show that the phoneme /ʃ/ and /ʒ/ exist in Balti language.

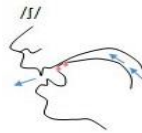


Diagram 3

Observation on phoneme /ʃ/ of the Balti language by the researcher is shown in

Table 3
Description of phoneme /ʃ/ in Balti language

IPA symbol	/ʃ/
Place of articulation	Palato-Alveolar
Manner of articulation	Fricatives
Voicing	Voiceless
As-un-aspirated	un-aspirated
Perso-Arabic letter	ش

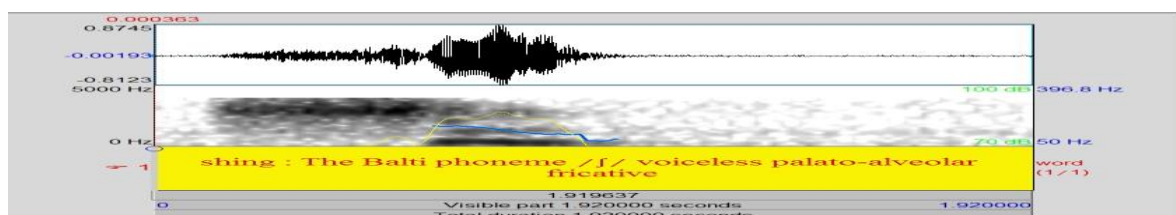
4 ش /ʃ/ (Palato-Alveolar)

Analysis

- The phoneme /ʃ/ is a voiceless palato-alveolar fricative in Balti language. For the production of this sound, the tongue raises the back of alveolar ridge as shown in the diagram 3. The air passes between the tip of tongue and the back of the alveolar ridge. When the air is pushed through narrow passage it causes a friction as shown in the spectrogram 3. No vibration has been observed during the acoustic analysis of this sound through Praat computer software (see in the spectrogram 3). Therefore, this is a voiceless sound.

The spectrogram 3: The Balti phoneme /ʃ/

Observation on phoneme /ʃ/ of the Balti language by the researcher is shown in



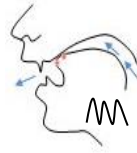


Diagram 4

Table 4

Description of phoneme /ʒ/ in Balti language

IPA symbol	/ʒ/
Place of articulation	Palato-Alveolar
Manner of articulation	Fricative
Voicing	Voiced
As-un-aspirated	un-aspirated
Perso-Arabic letter	ژ

5. ʒ/ʒ/ (Voiced Palato-Alveolar)

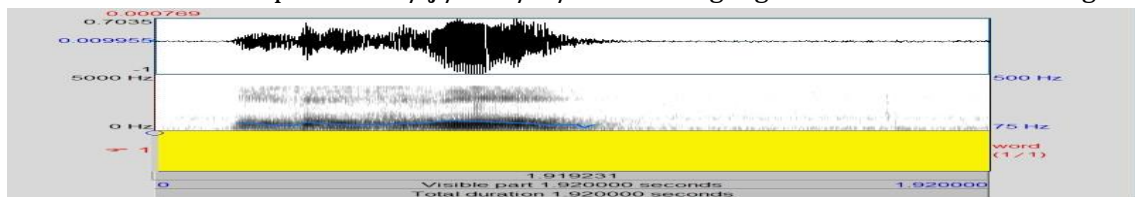
Analysis

The phoneme /ʒ/ is a voiced palato-alveolar fricative in Balti language. In the articulation of this sound the tongue rises towards the back of alveolar ridge as see in the diagram.4. The air passes between the tip of tongue and the back of the alveolar ridge. When the air is pushed through narrow passage, it causes a friction as shown in the spectrogram 4. A strong vibration has been observed during the acoustic analysis of this sound through Praat shown in the spectrogram 8. Therefore this is a voiced sound.

The spectrogram 4: The Balti phoneme /ʒ/

Minimal pairs for ʒ /y and x/ sounds

The existence of phonemes /y / and / x / in Balti language has been checked through



the following minimal pairs.

Minimal pairs	Transcription	Meaning
Kho	/xəu/	bitter
gho	/yəu/	Cray
Kha	/xə/	Anger
gha	/yə/	five

Finding

The above pairs show that the phoneme / x/ and /y / exist in Balti language.

Observation on phoneme /x/ of the Balti language by the researcher is shown in

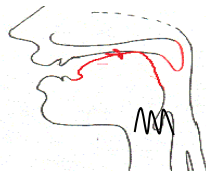


Diagram 5

Table 5

Description of phoneme /x/ in Balti language

IPA symbol	/x/
Place of articulation	Velar
Manner of articulation	Fricative
Voicing	Voiced
As-un-aspirated	un-aspirated
Perso-Arabic letter	خ

7. خ /x/ (Voiced Velar fricatives)

Analysis

4. The phoneme /x/ is a voiced velar fricative in Balti language. During the production of this sound the back of the tongue comes to the soft palate as shown in the diagram 5, which narrows the air passage due to which the air pressure is increased through diaphragm and when it is released, the sound comes through the narrow passage along with a friction noise as it touches the velar arch. During the production of this sound vibration has been observed in the vocal cords during acoustic analysis of this sound through Praat shown in the spectrogram 4.5. Therefore, it is a voiced sound.

The spectrogram 5: The Balti phoneme /x/

Observation on phoneme /y/ of the Balti language by the researcher is shown in:

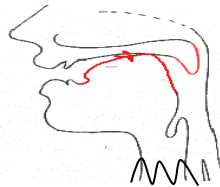
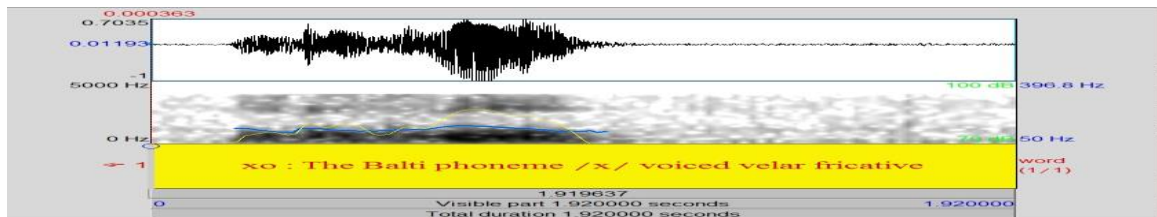


Diagram 6

Table 6

Description of phoneme /y/ in Balti language

IPA symbol	/y/
Place of articulation	Velar
Manner of articulation	Fricative
Voicing	Voiced
As-un-aspirated	un-aspirated

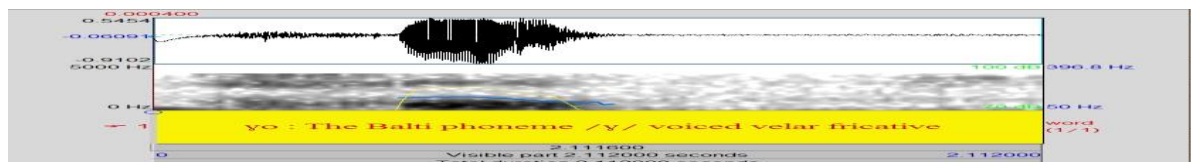
ع /ɣ/ (Voiced Velar fricatives)**Analysis**

5. The phoneme /ɣ/ is a voiced velar fricative in Balti language. During the production of this sound, the back of the tongue touches the back of soft palate as shown in the diagram 6. Meanwhile, the air pressure increases through diaphragm. When the air is released, the sound comes through the narrow passage with a friction noise. While producing this sound, vibration has been observed during acoustic analysis with the help of Praat computer software shown in the spectrogram 4.6. Therefore, it is a voiced sound. However, this sound is not found in other Tibetan languages (Old Tibet, Proto Western Tibet, and Modern Tibet) because this is again not an original Tibetan sound, (see in second section of chapter 2). It has been used for accommodating the Balti sound which remained un-accommodated.

The spectrogram 6: The Balti phoneme / ɣ /

9 Minimal pairs of /h^l/ and /h^r/ /h/ sounds

The existence of /h^l/ and /h^r/ /h/ sounds in Balti language has been checked through



the following minimal pairs.

Minimal pairs	Transcription	Meaning
Haq	/haq/	right
h ^l aq	/h ^l aq/	clear
h ^r naq	/h ^r naq/	Pip
hol	/hol/	Lazy
h ^l ta	/h ^l ta/	look

Finding

The above minimal pairs show that the phonemes /h/, /h^l/ and /h^r/ exist in Balti language.

Observation on phoneme /h/ of the Balti language by the researcher is shown in:



Diagram 7

Table 7

Description of phoneme /h/ in Balti language

IPA symbol	/h/
Place of articulation	Glottal
Manner of articulation	Fricative

Voicing	Un-voiced
As-un-aspirated	un-aspirated
Perso-Arabic letter	ح

ح (Voiceless glottal fricative)

Analysis

6. The phoneme /h/ is a voiceless glottal fricative sound in Balti language. In the production of this sound the air comes outwards without any obstruction. Friction has been observed but no vibration during acoustic analysis of this sound through Praat as shown in the spectrogram 4. 7.

The spectrogram 7: The Balti phoneme /h/



Observation on phoneme /h^r/ of the Balti language by the researcher is shown in

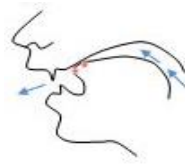


Diagram 8

Table 8

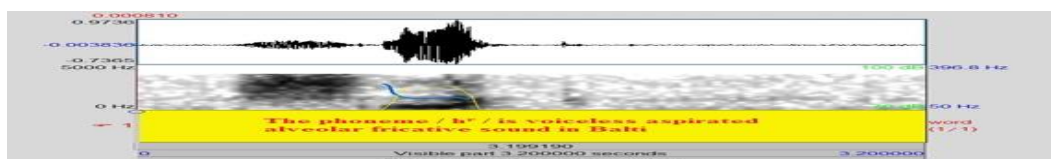
Description of phoneme /h^r/ in Balti language

IPA symbol	/h ^r /
Place of articulation	Alveolar
Manner of articulation	Fricative
Voicing	Voiceless
As-un-aspirated	Aspirated

(Voiceless alveolar fricative)

Analysis

The phoneme /h^r/ is voiceless aspirated alveolar fricative sound in Balti language. While producing this sound the tip of the tongue rises towards the alveolar ridge as shown in the diagram 4. 8. The air passes between the tip of tongue and the alveolar ridge creating a strong friction. Moreover, no vibration has been observed by the researcher during acoustic analysis of this sound through Praat computer software shown in the spectrogram 8. Therefore, this is a voiceless sound.



The spectrogram 8: The Balti phoneme /h^r/

Observation on phoneme /h¹/ of the Balti language by the researcher is shown in

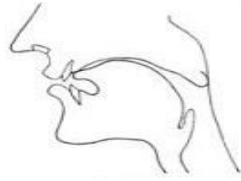


Diagram 9

Table 9: Description of phoneme /h¹/ in Balti language

IPA symbol	/h ¹ /
Place of articulation	Alveolar
Manner of articulation	Fricative
Voicing	Voiceless
As-un-aspirated	Aspirated

/h¹/ (Voiceless alveolar fricative)

Analysis

--The phoneme /h¹/ is voiceless aspirated alveolar fricative sound in Balti language. While producing this sound the tip of the tongue rises towards the alveolar ridge as shown in the diagram 4. 9. The air passes from the right side rim of the tongue with a strong friction (spectrogram 4. 9) . Moreover, no vibration has been observed by the researcher during acoustic analysis of this sound through Praat computer software shown in the spectrogram 9. That's way this is a voiceless sound.



The spectrogram 9: The Balti phoneme /h¹/

Observation on phoneme /r/ of the Balti language by the researcher is shown in

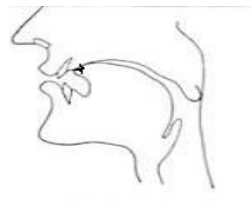


Diagram 10

**Table 10
Description of phoneme /r/ in Balti language**

IPA symbol	/r/
Place of articulation	Alveolar
Manner of articulation	Fricative
Voicing	Voiced
As-un-aspirated	un-aspirated
Perso-Arabic letter	ر

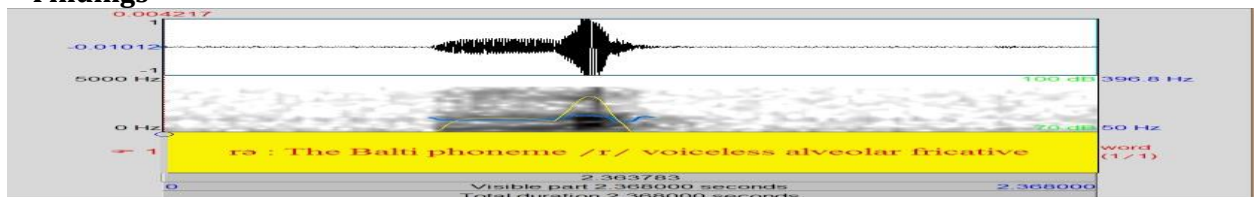
ɹ/r/ (Voiced Alveolar)

Analysis

- The phoneme /r / is a voiced alveolar fricative sound in Balti language. To produce this sound, the Balti speakers raise the tip of the tongue towards the alveolar ridge as shown in the diagram 10. The air passes between the alveolar ridge and the tip of the tongue with very narrow opening. Friction and vibration have been observed during acoustic analysis of this sound shown in the spectrogram 4.10. Therefore, this is voiced fricative sound.

The spectrogram 10: The Balti phoneme /r/

Findings



10 Fricative phonemes, i.e., /s/, /z/, /r/, /h^l/, /ʃ/, /ʒ/, /x/, /ɣ/, /h^r/ and /h/ have been found in the Balti language. During the production of these phonemes, a strong friction has been observed on Praat. Therefore, these are fricative sounds. Moreover, the phoneme /s/, /h^l/, /ʃ/, /h^r/ and /h/ are voiceless fricatives because no vibration has been observed during acoustic analysis of these phonemes on Praat software. On the other hand, the phoneme /z/, /r/, /ʒ/, /x/ and /ɣ / are the voiced fricative sounds because a strong vibration has been observed during the production of these sounds on Praat.

Limitation of the study

The study delimits to the description and classification of only fricative (consonant) sounds of Balti language and suggests investigating other consonants and vowel sounds, phonological reconstruction and syllable structure of Balti language for the future researcher.

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