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A Preliminary Study of Sherdukpen Phonology

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ABSTRACT

This paper is a preliminary description of the phonology of Sherdukpen language, which is spoken in Rupa, a valley town in the West Kameng district of Arunachal Pradesh. Sherdukpen is a highly endangered language with a population of around 4000 speakers in total (Eberhard et al. 2021). The language has not been adequately described and documented yet (cf. Jacquesson 2015). The analysis of the language is based on the data collected in my recent field visit to Rupa in December 2021.

This paper presents a description of the segmental inventories and the syllable structure of Sherdukpen. The consonant inventory consists of 23 consonants. Twelve of them are plosives, six fricatives, three approximants, three nasals and a trill. There are three series of stops: voiced, voiceless and voiceless aspirated. Sherdukpen has twenty two vowels among which five of them are nasal vowels five are secondary and one nasal secondary vowels.

KEYWORDS

Mey, Sherdukpen, Tibeto-Burman, Phonology

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A Preliminary Study of Sherdukpen Phonology

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1 Introduction

This paper is a preliminary study of the phonology of Sherdukpen, which is a Sino-Tibetan language spoken in the West Kameng district of Arunachal Pradesh which falls under the Western Kho-bwa language family. Sherdukpen is also known as Mey among the community members. There are mainly two varieties of the language, Shergaon variety and Rupa variety. This paper is a description of the variety spoken in Rupa. The word Sherdukpen is a result of blending of ‘Sher’ and ‘Tukpen’, where ‘Sher’ refers to Shergaon and ‘Tukpen’ is the traditional name of Rupa.

Sherdukpen belongs to a small yet distinct language family known as Kho-Bwa. The term Kho-Bwa was first used by van Driem(2001). The vocabulary of the language is divergent from a typical Tibeto-Burman language but it does have a number of apparent Tibeto-Burman cognates (Burling, 2003). It was suggested that Puroik, Bugun, Sherdukpen and Lishpa-Butpa fall into same coherent linguistic group which is known as Kho-Bwa (Burling, 2003).

Sherdukpen is an underdescribed language. Some important work on the language are Dondrup (1988), Jacquesson (2015), and Blench (2012). Dondrup (1988) is a sketch grammar based on the Shergaon variety. It briefly talks about the phonology, morphology, sentence structure and common vocabulary. It also includes a detailed wordlist. Jacquesson (2015) is a sketch grammar of the variety of Sherdukpen spoken in Rupa, which covers almost all the basic aspects of a grammar.

In this research the data is collected from Rupa town. The recording was carried out with the help of 13 consultants the table (Table 1) below has their information. The audio was recorded in the 16-bit WAVE format and the videos were recorded in 1080 60fps. The equipment used to record data were Zoom H1n PCM audio recorder and a DJI Osmo Pocket video camera. The data used in this study were collected in two field visits in 2021 and 2022. The data collected include the complete NILDA (North East Indian Languages Documentation Award) word list (1100 words) and narratives on different topics like traditional cuisine recipes, rituals, history of the place, etc. The first map (Figure 1) is showing the districts of Arunachal Pradesh and the second (Figure 2) is the map of West Kameng District.

Name	Age	Sex
Rinchin Norbu Musobi	75	Male
Chezang Khcrime	70	Male
Nima Tongchi	70	Male
Sangkhandu Musobi	67	Male
Tenzing Gombu Khcrime	65	Male
Pema Chhom Musobi	60	Female
Tenzing Wangmu Thongdok	52	Female
Sange Chhom Thongon	50	Female
Sange Norbu Musobi	44	Male
Tashi Dorjee Thongdok	43	Male
Nima Monoji	36	Female
Dorjee Wangchu Megeji	35	Male
Tsering Tansin Khcrime	34	Male
Rinchin Musabi	27	Male

Table 1 – Names of the informants

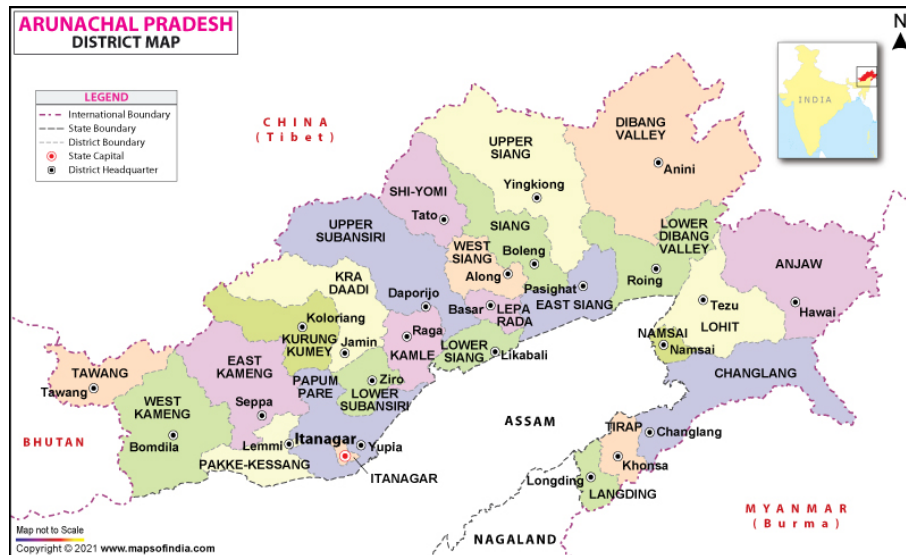


Figure 1 – Arunachal Pradesh District Map



Figure 2 – Rupa on map of West Kameng District

2 Consonants

There are 23 consonants in Sherdukpen which contrast at five point of articulations and five manners of articulation. Thirteen are plosives, three are nasals, three are fricatives, three are approximants and one is a trill.

The consonant inventory of Sherdukpen is given below in Table 1.

		Bilabial		Alveolar		Palatal		Velar		Glottal	
		VL	V	VL	V	VL	V	VL	V	VL	V
Plosive	unaspirated	p	b	t	d	c	ɟ	k	g	ʔ	
	aspirated	p ^h		t ^h		c ^h		k ^h			
Nasal		m		n				ŋ			
Trill				r							
Fricative				s	z					h	
Approximant		w		l		j					

Table 2 – Consonant Inventory

Except for the glottal stop and the velar nasal, all consonants can occur in word initial position. However, only about half of the consonants can occur in word-final position. Final consonants are shown in Table 3.

	Bilabial		Alveolar		Velar		Glottal	
	VL	V	VL	V	VL	V	VL	V
Plosive	p	b	t	d	k	g	ʔ	
Nasal	m		n		ŋ			
Trill			r					
Fricative							h	

Table 3 – Word-final consonants

Contrast among the consonants are shown below. Note that most contrasts are shown with near minimal pairs due to lack of true minimal pairs.

2.1. Stops

Stops contrast both in voicing and aspiration. Stops can be voiceless unaspirated, voiceless aspirated, and voiced aspirated. The following near minimal pairs show the relevant contrasts in the word-initial, word-medial and word final positions. The glottal stops are rare in the language and mostly occurs in the word-final positions.

The first table shows the voicing contrast and the second demonstrates the aspiration contrast.

word-initial	word-final
/p/ [pokpa] ‘betray’	/p/ [əc ^h ap] ‘thin’
/b/ [bok ^h o] ‘sand’	/b/ [marhab] ‘python’

Table 4 – Minimal pair: /p/ versus /b/

word-initial	word-final
/p/ [pardopa] ‘miss target’	-
/p ^h / [p ^h aduba] ‘firefly’	-

Table 5 – /p/ versus /p^h/

As discussed, the alveolar stops contrast in aspiration and voicing. The following tables illustrate voicing and aspiration contrasts respectively.

word-initial	word-final
/t/ [toŋsin] ‘beam’	/t/ [kat] ‘voice’
/d/ [doŋza] ‘manner’	/d/ [zad] ‘bronze’

Table 6 – /t/ versus /d/

word-initial	word-final
/t/ [tuŋ] ‘year’	-
/t ^h / [t ^h uŋ] ‘hammer’	-

Table 7 – /t/ versus /t^h/

The following near-minimal pairs show the contrast between palatal stops regarding aspiration and voicing.

word-initial	word-final
/c/ [co:ŋ] ‘onion’	-
/j/ [joŋ] ‘fortress’	-

Table 8 – /c/ versus /j/

word-initial	word-final
/c/ [ciŋ] ‘drum’	-
/c ^h / [c ^h i] ‘honey’	-

Table 9 – /c/ versus /c^h/

The following minimal pairs shows the contrast between the velar stops in terms of aspiration and voicing.

word-initial	word-final
/k/ [kor] ‘area’	/t/ [tʰik] ‘village’
/g/ [gor] ‘fence’	/g/ [mig] ‘arrow’

Table 10 – /k/ versus /g/

word-initial	word-final
/k/ [ki] ‘body’	-
/kʰ/ [kʰibi] ‘eye’	-

Table 11 – /k/ versus /kʰ/

The following near minimal pairs demonstrate the contrast between the glottal stop /ʔ/ and velar stops /k/. The glottal stop seem to occur only in syllable final.

word-initial	word-final
-	/ʔ/ [oʔoʔ] ‘dry’
-	/k/ [tʰok] ‘rope’

Table 12 – /ʔ/ versus /k/

2.2. Nasals

The following near minimal pairs demonstrate the contrasts between nasal consonants occurring in the word-initial and word-final positions at bilabial, alveolar and velar place of articulation.

The following minimal pairs demonstrate the contrasts between the bilabial, alveolar and velar nasal consonants.

word-initial	word-final
/m/ [ma] ‘bamboo’	/m/ [rim] ‘border’
/n/ [na] ‘you’	/n/ [sin] ‘gold’

Table 13 – /m/ versus /n/

word-initial	word-final
-	/n/ [nin] ‘silver’
-	/ŋ/ [niŋ] ‘milk’

Table 14 – /m/ versus /n/

2.3. Fricatives

The following pairs demonstrate the contrasts between fricatives occurring at word-initial and word-final positions at alveolar and post-alveolar place of articulations.

word-initial	word-final
/s/ [sin] ‘gold’	-
/z/ [ziŋ] ‘guest’	-

Table 15 – /s/ versus /z/

The minimal pairs show the contrasts between the voiced and voiceless alveolar and the glottal fricatives.

word-initial	word-final
/s/ [siŋin] ‘gums’	-
/h/ [hiŋ ^h iŋ] ‘tree’	-

Table 16 – /s/ versus /h/

The following minimal pairs demonstrate the contrasts between voiced alveolar fricative and the voiced palatal stop.

word-initial	word-final
/z/ [zoŋ] ‘spear’	-
/ʝ/ [ʝoŋ] ‘fortress’	-

Table 17 – /z/ versus /ʝ/

2.4. Approximants

The following near-minimal pairs demonstrate the contrasts between approximants occurring in the word-initial, word-medial and word-final positions at alveolar, palatal and velar place of articulations.

word-initial	word-final
/r/ [rim] ‘border’	-
/l/ [liŋ] ‘stone’	-

Table 18 – /r/ versus /l/

The following minimal pairs demonstrate the contrasts between the voiceless bilabial approximant and the voiceless palatal approximant.

word-initial	word-final
/j/ [ja] ‘stool’	-
/w/ [wa] ‘he she’	-

Table 19 – /j/ versus /w/

The following minimal pairs shows the contrasts between the voiceless alveolar approximant and the voiceless bilabial approximant.

word-initial	word-final
/l/ [lek ^h ego] ‘behind’	-
/w/ [wekmo] ‘divide’	-

Table 20 – /l/ versus /w/

3 Vowels

I have found seven primary oral vowels. Four of the primary oral vowels also have nasal counterparts, which are /ĩ/, /ẽ/, /ũ/, and /õ/. Sherdukpen also has five secondary oral vowels,

even though they are very low in frequency. Thus, total number of vowels are 16. these vowels have been identified with the help of minimal pairs and Praat. The vowel phonemes have been divided into six levels of height or aperture: close, close-mid, mid, open-mid and open, and three levels of backness: front, central and back.

3.1. Primary oral vowels

	Front	Central	Back
close	i		u
close-mid	e		o
mid		ə	
open-mid			ɔ
open		a	

Table 21 – Primary Oral Vowels

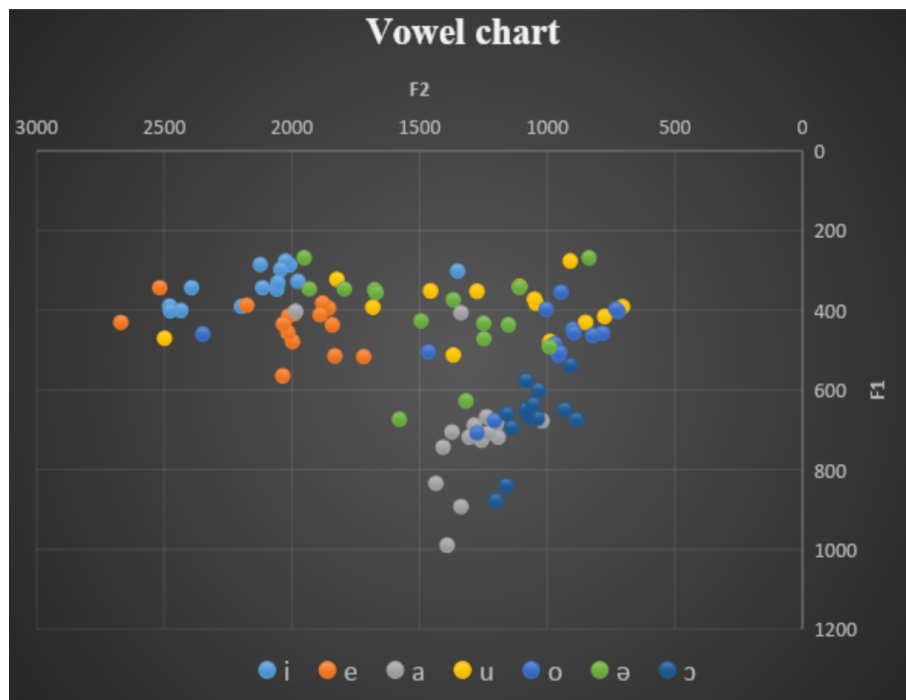


Figure 3 – Vowels F1 and F2

Figure 3 illustrates the eight different primary vowels in Sherdukpen. The individual vowels are illustrated below.

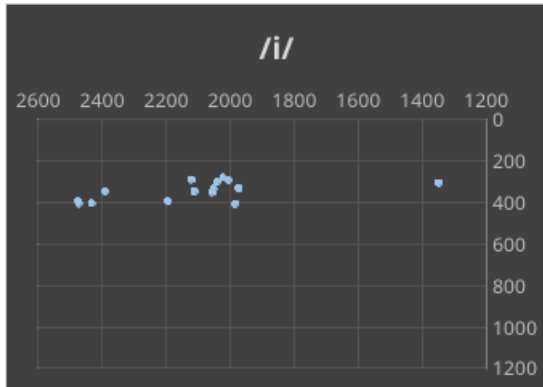


Figure 4 – Vowel /i/

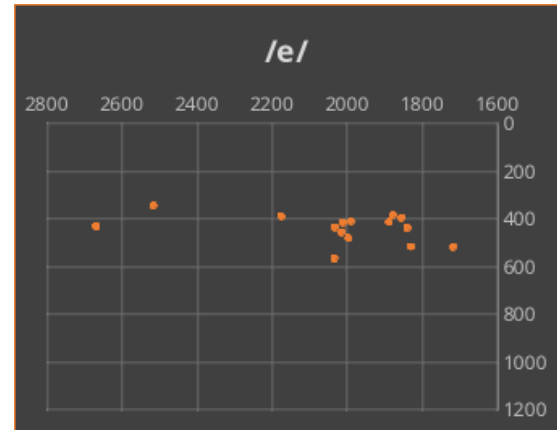


Figure 5 – Vowel /e/

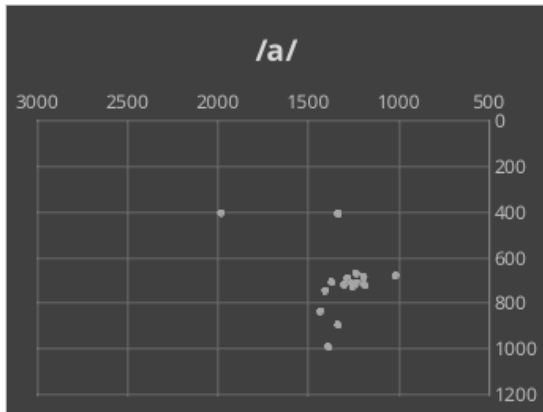


Figure 6 – Vowel /a/

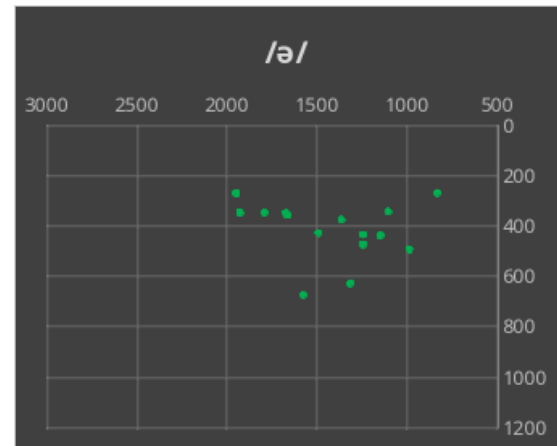


Figure 7 – Vowel /ə/

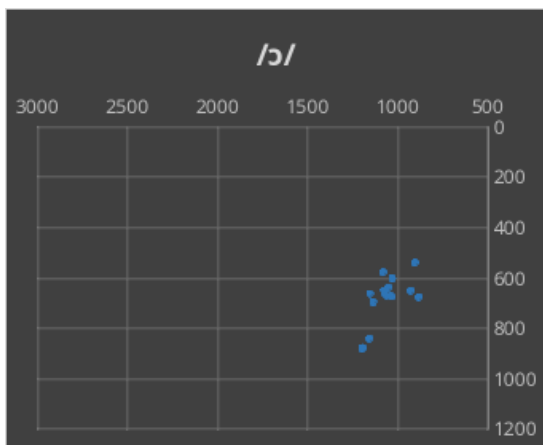


Figure 8 – Vowel /ɔ/

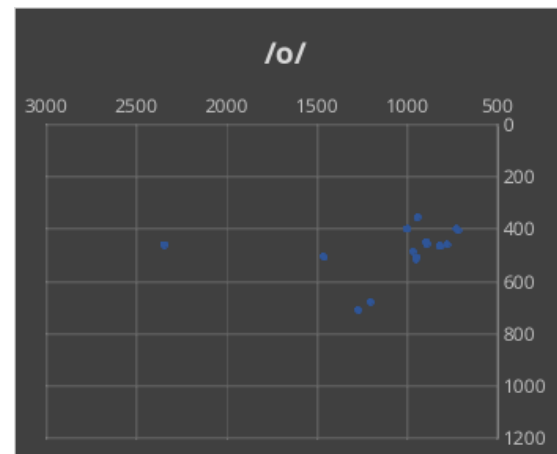


Figure 9 – Vowel /o/

The following tables demonstrates the minimal and near-minimal pair of the language.

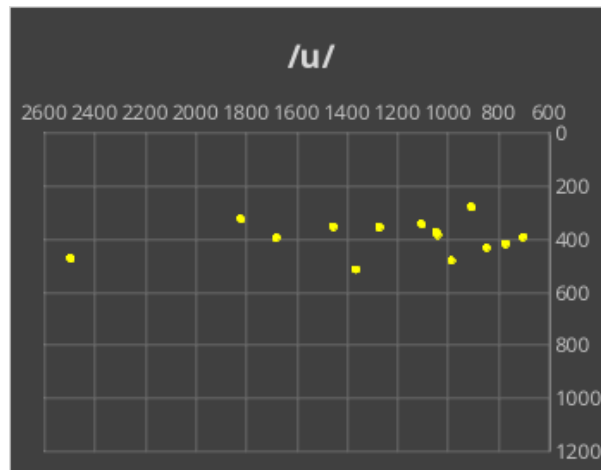


Figure 10 – Vowel /u/

Front Vowels

Front Close ‘i’	Front close-mid ‘e’
/i/ [bi] ‘no’	/e/ [beʔ] ‘turmeric’
/i/ [əmiŋ] ‘body hair’	/e/ [teŋteŋ] ‘straight’

Table 22 – Front vowels

Central Vowels

Central-mid ‘ə’	Central-open ‘a’
/ə/ [əŋju] ‘bad’	/a/ [anja] ‘tail’
/ə/ [əzeŋ] ‘name’	/a/ [azon] ‘father-in-law’
/ə/ [səliŋ] ‘heart’	/a/ [sali] ‘betel’
/ə/ [latekrə] ‘heel’	/a/ [məra] ‘why’

Table 23 – Central vowels

Back Vowels

Close ‘u’	Close-mid ‘o’	Open-mid ‘ɔ’
/u/ [huŋba] ‘scared’	/o/ [hoŋ] ‘thread’	/ɔ/ [suŋkrə] ‘facial hair’
/u/ [spu] ‘cow’	/o/ [bro] ‘song’	/ɔ/ [suŋkrə] ‘facial hair’
/u/ [gormu] ‘round’	/o/ [hotpo] ‘bright’	/ɔ/ [zormə] ‘join’
/u/ [rigutu] ‘frog’	/o/ [rewo] ‘hope’	/ɔ/ [hiŋgə] ‘stack’

Table 24 – Back vowels

3.2. Nasal vowels

There are 5 nasal vowels. These nasal vowels are one of the major features of the language and they are quite frequent. There are no central nasal vowels.

	Front	Central	Back
close	ĩ	-	ũ
close-mid	ẽ	-	õ
open-mid	-	-	ô

Table 25 – Primary nasal vowels

Front Vowels	
Front Close ‘ĩ’	Front close-mid ‘ẽ’
/ĩ/ [zĩba] ‘grind’	/ẽ/ [hẽba] ‘love’
/ĩ/ [zĩ] ‘urine’	/ẽ/ [sẽ] ‘iron’
/ĩ/ [k ^h aĩ] ‘twenty’	/ẽ/ [əc ^h ẽ] ‘liver’

Table 26 – Front Vowels

3.3. Secondary vowels

There are five secondary vowels in Sherdukpen and one secondary close-mid front nasal vowel. These vowels are quite rare vowels and so far I have found that they occur in limited number of words. The secondary vowels in the language can mostly be used by the elder generation of speakers, the younger generation of the speakers seems to have almost simplified it to primary vowels. For example : /y/ [my] ‘mushroom’ can often be heard as /i/ [mi] , /ø/ [zø] ‘goat’ as /e/ [ze]. Similarly for the rest of the secondary vowels.

	Front	Central	Back
close	y	-	u
near-close	Y	-	-
close-mid	ø õ	-	-
open	æ	-	-

Table 27 – Secondary vowels

Front Vowels				
Close	Near-close	Close-mid	\Close-mid (nasal)	Open
/y/ [my] ‘mushroom’	/Y/ [dY] ‘demon’	/ø/ [gø] ‘monitor lizard’	/õ/ [zõ] ‘goat’	/æ/ [gæ-c ^h ũ] ‘mud’
/y/ [k ^h yt] ‘six’	—	—	—	—
/y/]k ^h y] ‘garden’	—	—	—	—
/y/ [hy hy rapa] ‘whistle’	—	—	—	—

Table 28 – Secondary front vowels

I have adhered to Daniel Jones’ cardinal vowel system, wherein secondary vowels exhibit reversed lip postures compared to primary vowels, and supporting evidence is provided through

recorded video footage. The term "secondary" is employed due to the limited occurrence of these vowels. It's noteworthy that the present generation of speakers has largely forsaken these secondary vowels, favouring the usage of more straightforward oral vowels. Table 27 shows the secondary vowels.

3.4. Diphthongs

	Front	Back
Close	ei oi	au
Close-mid		ao

Table 29 – Diphthongs

Sherdukpen has four diphthongs: /oi/, /au/, /ao/ and /ei/. None of the diphthongs occur in the initial positions.

The diphthong /ei/ only occurs in the word-medial positions.

word-initial	word-medial	word-final
	/ei/ [jeiba] 'lullaby'	
-	/ei/ [jaheipa] 'dairrohea'	-
	/ei/ [c ^h eikhan] 'to wash'	

The diphthong /oi/ only occurs in the word-final positions. /oi/ in the initial position is very rare and cannot be called as a Sherdukpen lexeme as /oi/ in many instances can be used as a greeting word or agreeing to somebody.

word-initial	word-medial	word-final
		/oi/ [danboi] 'to know'
/oi/ [oi] 'yes'	-	/oi/ [jopoi] 'to hear'
		/oi/ [gaudo] 'to clear'

The diphthongs /ao/ occur in both word-medial and word-final positions.

word-initial	word-medial	word-final
	/ao/ [jaomo] 'rise'	/ao/ [drao] 'dead body'
-	/ao/ [gaoba] 'beleive'	/ao/ [bəkao] 'forehead'

The diphthongs /au/ only occurs word-final positions.

word-initial	word-medial	word-final
		/au/ [drau] 'goitre'
-	-	/au/ [sau] 'wild dog'

The diphthongs /au/ and /ao/ are very common in the language. Minimal and sub-minimal pairs are given below.

au [drau] ‘goitre’
 ao [drao] ‘dead body’

/au/ [sau] ‘wild dog’
 /ao/ [nəc^hao] ‘mouth’

/ao/ [bəkau] ‘forehead’
 /au/ [boŋkau] ‘pocket’

4 Tones

Three prominent tones have emerged from the analysis, each contributing unique characteristics to the language under examination. These tones, delineated through a systematic categorization process, offer insights into the subtle nuances that shape linguistic expression. They are H1, H2 and L. The H1 tone is the high tone having no constriction. The H2 is also a high tone but it has a glottal constriction. And the last tone L is clearly the low tone. Table 29 shows the tones in the language.

Tone 1 (High and short) (H1)	ha ‘food’	kho ‘cane stick’	li ‘bow’
Tone 2 (High and long) (H2)		kho ‘tax’	
Tone 3 (Low) (L)	ha ‘blood’	kho ‘water’	li ‘sacred stone’

Table 30 – Tones of Sherdukpen

4.1. Ha

‘Food’ is high tone and ha ‘blood’ is low tone.



Figure 11 – Line diagram of H1 and L

The high tone has a glottal constriction, whereas the low tone has no constriction.

As a result, the duration of the high tone vowel is relatively shorter than the length of the low tone vowel.

In case TTK (34 years old) we observed opposite pitch pattern that is food was produced as low and blood was produced as high. This may be due to lack of prominence of tone in the speech of younger generation. It is also observed that TTK produced the iterations with variation.

We have observed two tones high and low the high tone has a glottal constriction and it is shorter, the low tone has no constriction and has a longer vowel duration.

4.2. Kho

Kho ‘cane stick’ is high tone and kho ‘water’ is low tone. The high tone has a glottal constriction and it is shorter.

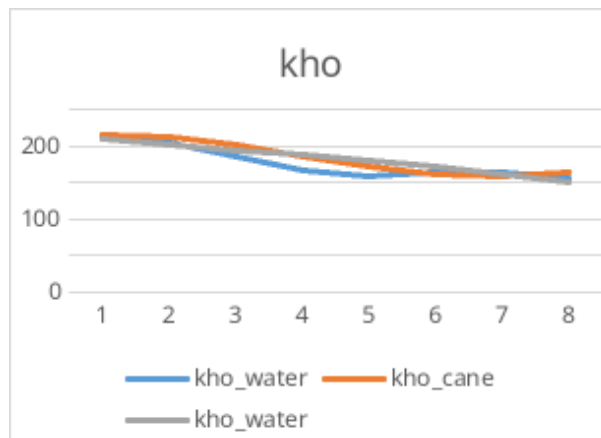


Figure 12 – Line diagram of H1,H2 and L

The tone on ‘cane stick’ is clearly high and short and sometimes it is accompanied by a glottal constriction. The tone on ‘tax’ is also high but it is longer than ‘cane stick’ and there is no clear glottal constriction. The tone on ‘water’ is clearly low and there is no glottal constriction and it is also longer than ‘cane stick’. The contrast is clearer in the speech of TWT.

4.3. Li

Li ‘bow’ is high tone li ‘body’ has a glottal constriction at the end and li ‘sacred stone’ is low tone. The tones in ‘body’ is H2, ‘bow’ is H1 and ‘sacred stone’ is clearly L.

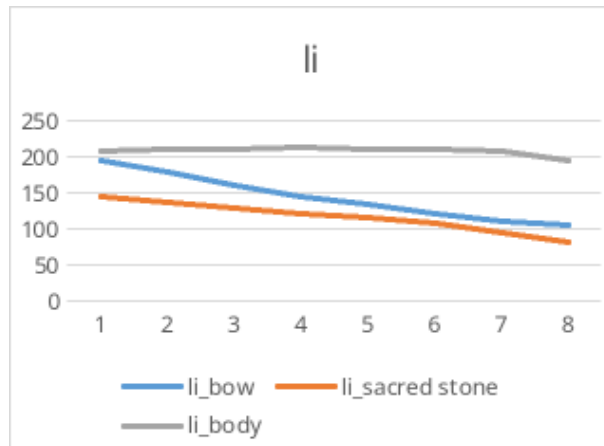


Figure 13 – Line diagram of H1, H2 and L

The duration of the high tone is shorter than that of the low tone. Also, the li ‘sacred stone’ has the secondary vowel in the older speakers but the younger speakers use it as primary vowel. However, even though the vowels have changed the tone is marked similar in both the cases.

4.4. Zepa

Since zepa is a disyllabic morpheme, in case of V1 is Zepa ‘tear’ is high (H2H1) tone and zepa ‘to broom’ is low high (LH1)tone.

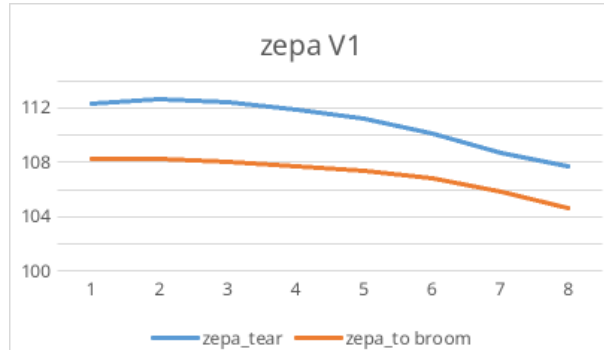


Figure 14 – Line diagram of V1: H2 and L

Whereas, in the V2 the tones seems to be inconsistent. The duration of the high tone is longer than the low tone.

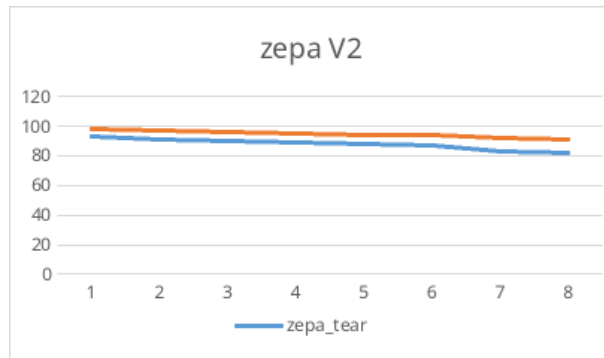


Figure 15 – Line diagram of V2: H2 and L

4.5. Iba

In case of iba ‘wipe’ the V1 is high tone (H2H1) and in iba ‘death’ V1 is low tone (LH1). The duration of the V1 iba ‘death’ is shorter than the iba ‘wipe’.

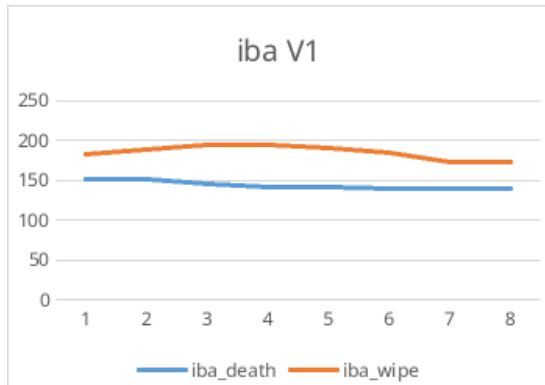


Figure 16 – Line diagram of V1: H2 and L

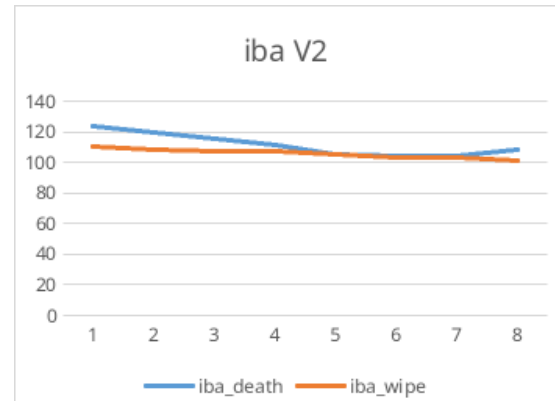


Figure 17 – Line diagram of V2: H2 and L

Iba ‘death’ the V2 is high. In case of V1 Iba ‘death’ shorter than iba ‘wipe’

4.6. Nini

Nini ‘baby’ – LH1. The first syllable is low tone and the second has high tone with glottal constriction, that is the tone 1.

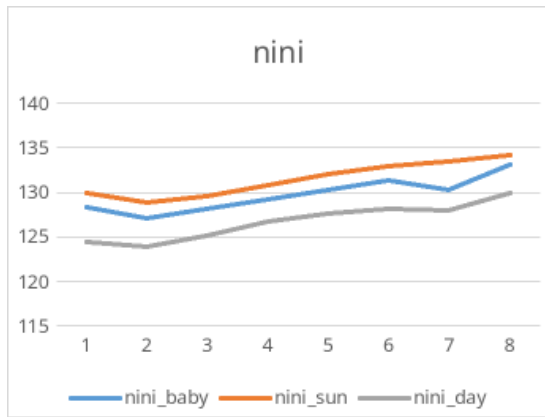


Figure 18 – Line Diagram of V1: L and L

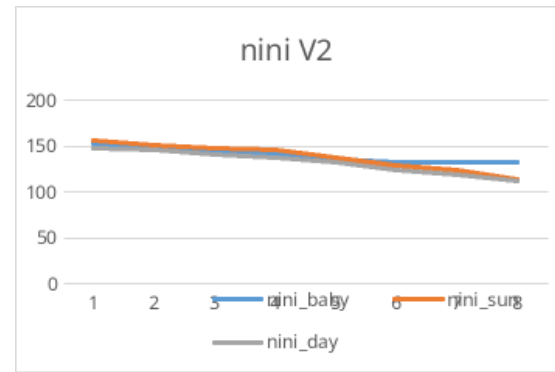


Figure 19 – Line diagram of V2: H1 and L

Nini ‘day’ – LL. Both the syllables have a low tone, that is tone 3.

5 Syllable structure

Sherdukpen has five syllable types given below.

CV	p ^{hi}	‘insects’	li	‘bow’
VC	ig	‘hand’		
CLV	p ^{hi} li	‘needle’	li	‘sacred stone’
CVC	p ^{hoŋ}	‘shelf’		
CCVC	p ^{hroŋ}	‘floor’		

In CLV syllable structure, ‘L’ stands for liquid consonants, the second consonant can be /l/, /r/, /w/ or /j/. For example, /p^{hi}li/ ‘needle’, /p^{hi}lu/ ‘axe’, /p^hwatdopa/ ‘hand up’, /p^hroŋ/ ‘floor’, /nja/ ‘who’.

The CCVC can also be written as CLVC, as the second consonant is also restricted to liquid consonants.

6 Conclusion

Sherdukpen is an endangered language that has around 5000 speakers in total with two varieties. It is mainly spoken in Shergaon and Rupa. The dialect that I am discussing here is the Rupa dialect. It is also an unwritten language which has very limited amount of written literature written down in Devnagari or Roman script. In this paper, I have described the language and its sound system: the consonants, vowels, diphthongs and the syllable structure. The Shergaon variety has tones, whereas, the Rupa variety has no tones. Sherdukpen has 23 consonants, 18 vowels of which 7 are primary vowels, 5 are nasal vowels, 6 are secondary vowels. Also I have found 4 diphthongs. Sherdukpen uses 5 syllable structure types: VC, CV, CVC, CLV and CCVC.

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