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Himalayan Linguistics

Sound system of Monsang

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ABSTRACT

This paper is an overview on the sound system of Monsang, an endangered Trans-Himalayan language of Northeast India. This study shows that Monsang has 24 consonant phonemes, 11 vowel phonemes (including the rare diphthong /au/ and the three long vowels) and two lexical tones. Maximally a syllable in Monsang is CVC, and minimally a syllable is V or a syllabic nasal. The motivation of this work is the desire of the community to develop a standard orthography.

KEYWORDS

Phonology; Tibeto-Burman; Kuki- chin; Monsang, acoustic, phonemes

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*Sound system of Monsang*¹

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1 Introduction

This paper presents an overview on phonetics and phonology of Monsang (ISO 6393, ethnologue), an endangered Trans-Himalayan language spoken by the Monsang in Manipur, Northeast India. The population of Monsang is reported as 2,372 only, according to the 2011 census of India². Except Konnerth (2018), no linguistic work has been done on Monsang to date. In Konnerth (2018), a diachronic explanation of Monsang phonology is given, with a section on phonology of *Liwachangning* variety. However, in her study the phonetic detail and phonemic status of the sound system are not given due attention. So, the aim of this paper is to provide a descriptive account on the phonetics and phonology of Monsang in sequel to Konnerth (2018), as spoken in *Monsang Pantha* village. The motivation of this work is the desire of the community to develop a standard orthography. This study on Monsang shows that syllables can be of CVC structure maximally or only V structure minimally, with 24 consonant phonemes, 11 vowel phonemes (including one diphthong and long vowels) and two lexical tones.

The paper begins with a brief introduction about the language in section 2. In section 3, the methodology of the study is given. Under section 4, the vowel system is discussed. The analysis of the consonant sounds is given in section 5. Section 6 includes the discussion on the syllable structure. The analysis of tone is provided in section 7. The paper concludes with a summary of the main points of the paper, in section 8.

2 About the language

Monsang belongs to a linguistic group that has traditionally always been referred to as ‘Kuki-chin’ or ‘Northwestern Kuki-Chin’ (Post and Burling 2017), although the people self-identify

¹ This paper is a revision of the paper presented in SEALS26, 2016 at Manila. We are grateful to the three anonymous reviewers for their constructive comments and suggestions. We thank Linda Konnerth for her valuable suggestions and comments on this paper. In addition, we also would like to thank the elders who have encouraged us to work on this.

² <http://censusindia.gov.in/>

ethnically as Naga. Recently, Konnerth (2018) suggests that the subgroup name ‘Northwestern Kuki-Chin’ of the branch of Trans-Himalayan to be reduced to ‘Northwestern’, by omitting the term ‘Kuki-Chin’; the term ‘Kuki-Chin’ is not accepted by most of the communities in Manipur.

In Monsang, the community members call themselves as *sirti*, which means southerners, and the language as *sirti ton* ‘Monsang language’ (literally, southerner’s language)³. The people of Monsang Naga dwell in six villages within Chandel district of Manipur, a northeast state of India (figure 1): Liwachangning, Changnhe, Liwa Khullen (Meeleen), Liwa Sarei, Japhou and Monsang Pantha (Pentha Khuwpuw).



Figure 1. Map of northeast India showing Monsang Pantha within Manipur state, bordering to Myanmar; this map is taken from google map.

3 Methodology

The data are elicited from the first author—who is a native speaker of the Monsang Pantha variety, and the data are later crosschecked with two other native speakers. Similarly, the first author’s speech is recorded for the acoustic analysis. For the vowels analysis, examples (1) to (12) are recorded in isolation for three iterations. And for the analysis of consonant sounds, examples (68) to (86) are recorded in isolation for three iterations. For tone data the target words in the minimal sets given in

³ According to the elders in Monsang Pantha village, the word ‘Monsang’ is derived from the name of one of their leaders—Mr. Mosang. While the people of *Sirti* (native name) were in *Rungputung* (one of the oldest villages of Monsang) in the past, the neighbouring villages, particularly the Meiteis (Manipuris), began to call this *Rungputung* village as ‘Mosang’s village’. Eventually, the Meiteis and other neighbouring people labelled the people of *Sirti* as ‘Mosang’. Later, the spelling ‘Mosang’ was written as ‘Monsang’ which is officially recorded by the government of India.

table (5) are recorded using a carrier phrase (a) for 3 iterations. In our limited data, we observed that there is no significant variation of the pitch in the first 'X' as isolation (before the carrier phrase) and the second 'x' (inside the carrier phrase); so, in this study, we only used the token of the first X.

For the recording, Samson 01 USB, unidirectional microphone is used which is directly connected to the laptop that has Praat (v.4.5.04) software installed. While recording the sampling frequency is set at 44100 Hz. The recording is conducted in a quiet room. After the recording, the sound files are saved in .Wav format.

a) *X*, kəŋ x kété 'x, I said x' (where *X* and *x* are the same target word)

4 Vowels⁴

Monsang has 11 vowel phonemes: six short vowels (/i/ /u/ /e/ /o/, /a/, and /ə/), three long vowels (/i:/ /u:/ and /a:/), one diphthong (/au/) and the pre-closure vowel (/wɨ/). Figure 2 represents the approximate location of each vowel phoneme. In this section we shall look into the phonemic status of these phonemes. After that, the phonetic details of these phonemes are discussed in the following subsections.

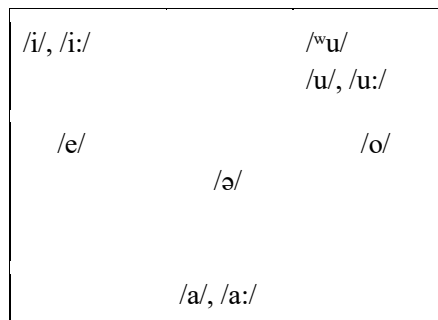


Figure 2. Vowel phonemes

The following minimal pairs demonstrate the phonemic status for all the vowels phonemes.

- (1) /i/ vs. /e/ *bí* 'beans', *bé* 'mouth'; *sí* 'go', *se* 'keep'
- (2) /e/ vs. /a/ *étá* 'ours', *átà* 'his or her's'; *emoŋ* 'short', *amoŋ* 'for a while'
- (3) /o/ vs. /u/ *to* 'hew', *tu* 'do'; *hoŋ* 'heap', *huŋ* 'come'
- (4) /u/ vs. /ə/ *t^hu* 'ride', *t^hə* 'blood'; *t^hur* 'hide', *t^hər* 'iron'
- (5) /ə/ vs. /a/ *thə* 'blood', *t^há* 'moon'; *sə* 'ask', *sà* 'eat'

⁴ In the open syllables, the glottal stop is evident in high tones, though not very prominent; we shall look into the feature of glottal stop in our future work.

- (6) /ə/ vs. /o/ *tə* ‘mix’, *to* ‘cut’; *tʰər* ‘iron’, *tʰor* ‘chase’
 (7) /^wu/ vs. /i/ *b^wu* ‘rice’, *bí* ‘beans’; *m^wu* ‘2PL (incl) marker’, *mi* ‘people’
 (8) /a/ vs. /^wu/ *la* ‘cotton’, *l^wù* ‘head’; *ha* ‘teeth’, *h^wu* ‘sound’
 (9) /u/ vs. /^wu/ *ru* ‘burn’, *r^wù* ‘bamboo’; *kúm* ‘year’, *k^wum* ‘bend’
 (10) /i/ vs. /i:/ *in* ‘curry’, *í:n* ‘house’; *ki* ‘pull’, *ki:* ‘hand’
 (11) /a/ vs. /a:/ *baŋ* ‘wall’, *ba:ŋ* ‘hang up’; *aŋ* ‘fourth brother’, *á:ŋ* ‘shoulder’
 (12) /u/ vs. /u:/ *bum* ‘help’, *bu:m* ‘put in’; *kum* ‘year’, *ku:m* ‘harvest’

4.1 *Phonetic realisation*

In the following sections the phonetic realisation of all the vowel phonemes and their place of occurrences are discussed.

4.1.1 *Short vowels*

The phoneme /i/ is a short, front, unrounded, close vowel [i], and is always realised as [i] both in open and close syllables. The phoneme /i/ may occur in word initial, medial and final positions, as given below.

- | | | | |
|------|-------------|--------|---------|
| (13) | <i>in</i> | [in] | ‘curry’ |
| (14) | <i>amin</i> | [amin] | ‘price’ |
| (15) | <i>bí</i> | [bíʔ] | ‘beans’ |

The phoneme /e/ is a short, front, unrounded, mid-close vowel [e]. The phoneme /e/ is mostly realised as [e], and if preceded by the consonant /l/, the phoneme /e/ is realised as [ɛ]. The vowel length of this vowel in close syllable is slightly longer than in open syllable when followed by a sonorant consonant; for instance, *te* [te] ‘say’ and *ten* [te:n] ‘run’. This phoneme can occur in word initial, medial and final positions, as exemplified below.

- | | | | |
|------|------------|--------|---------|
| (16) | <i>ér</i> | [é:ɪ] | ‘green’ |
| (17) | <i>per</i> | [pe.ɪ] | ‘mud’ |
| (18) | <i>le</i> | [lɛ] | ‘and’ |

The phoneme /ə/ is a short, central, unrounded vowel [ə]. In close syllable, where the coda is sonorant, the vowel length is longer than in open syllable; for instance, *rə* [ɪə] ‘flower’ and *rər* [ɪə:ɪ] ‘inward, inside’. This phoneme /ə/ may occur in word initial, medial and final positions, as exemplified below.

- | | | | |
|------|------------|--------|---------|
| (19) | <i>á</i> | [əʔ] | ‘chew’ |
| (20) | <i>dər</i> | [də:ɪ] | ‘pant’ |
| (21) | <i>tʰə</i> | [tʰəʔ] | ‘blood’ |

The phoneme /a/ is short, central, unrounded, open vowel [a], and is always realised as [a]. As given in examples below, this phoneme /a/ can occur in word initial, medial and final positions.

- | | | | |
|------|-------------|--------|----------|
| (22) | <i>àpá</i> | [àpáʔ] | ‘father’ |
| (23) | <i>kám</i> | [kám] | ‘close’ |
| (24) | <i>sápà</i> | [sápà] | ‘son’ |

The phoneme /o/ is a short, back, rounded, close-mid vowel [o]. However, in close syllable, where the code is /ŋ/ or /ɾ/, the phoneme /o/ is realised as [ɔ or ɔ:]. Similar to other vowels that show no length distinction, this phoneme /o/ also has longer vowel length in close syllable followed by sonorant consonants than the length when occurred in open syllable; for instance, *to* [to] ‘cut’ and *toŋ* [to:ŋ] ‘narrate’. As given in the following examples, the phoneme /o/ may occur in word initial, medial and final positions.

- | | | | |
|------|--------------------------|------------------------|-----------------------------------------|
| (25) | <i>oŋ</i> | [oŋ] | ‘sit’ |
| (26) | <i>sék^hór</i> | [sék ^h ó:ɾ] | ‘pond (in which buffalo usually bathe)’ |
| (27) | <i>to</i> | [to] | ‘hew’ |

Phoneme /u/ is a short, back, rounded, close vowel [u], and is always realised as [u]. In word initial, medial and final positions, this phoneme /u/ may occur as demonstrated in the examples below.

- | | | | |
|------|------------|-------|--------|
| (28) | <i>uti</i> | [uti] | ‘dog’ |
| (29) | <i>bum</i> | [bum] | ‘help’ |
| (30) | <i>tu</i> | [tu] | ‘do’ |

4.1.2 Long vowels

The phoneme /i:/ is a long, front, unrounded, close vowel [i:]. There is no allophonic variation for this phoneme. The phoneme /i:/ occurs in word initial, medial and final positions, as exemplified below.

- | | | | |
|------|------------------------|---------------------|---------|
| (31) | <i>i:n</i> | [i:n] | ‘house’ |
| (32) | <i>ti:m</i> | [ti:m] | ‘count’ |
| (33) | <i>k^hi:</i> | [k ^h i:] | ‘peel’ |

The phoneme /a:/ is a long, central, unrounded, open vowel [a:]. Similarly, this phoneme /a:/ has no allophony, and it may occur in word initial, medial and final positions as given below.

- | | | | |
|------|-------------------------|----------------------|---------|
| (34) | <i>á:p^wù</i> | [á:p ^w ù] | ‘owner’ |
| (35) | <i>za:r</i> | [za:ɾ] | ‘sleep’ |
| (36) | <i>ṅdà:</i> | [ṅdà:] | ‘far’ |

The phoneme /u:/ is a long, back, rounded, close vowel [u:], and has no allophony. Unlike other vowels, /u:/ restricts to occur in the final position, but occurs in word initial and medial position.

- | | | | |
|------|-------------|--------|---------------------|
| (37) | <i>u:ŋ</i> | [u:ŋ] | ‘shout’ |
| (38) | <i>zu:ŋ</i> | [zu:ŋ] | ‘monkey’ |
| (39) | <i>tu:r</i> | [tu:i] | ‘to take on credit’ |

4.1.3 *The pre-closure vowel /^wu/*

The phoneme /^wu/ is a short pre-closure vowel. Unlike other vowels, this phoneme is unique in its nature. The only feature that distinguishes the phoneme /^wu/ from the phoneme /u/ is the pre-closure movement of the lips, which looks like labialisation with slight frication between the lips. The term ‘labialisation’ is used to refer to the addition of a lip rounding gesture to a segment with the accompanying elevation of the back of the tongue (Ladefoged and Maddieson 1996). Taking this into account, Konnerth (2018) describes this phoneme /^wu/ as slightly centralised vowel [ʊ] that occurs in conjunction with labialisation of the preceding consonant. However, the pre-closure movement of the lips can only occur before the vowel /u/, and is seen occurring with most of the consonants (40 to 60). There are two reasons why we do not call this unique articulation as labialisation: this “like labialisation” articulation occurs only with the high back rounded /u/ and the “like labialisation” demonstrates slight frication between the lips with all the consonants. In addition, Ladefoged and Maddieson (1996: 356) report that when the consonants are labialised, the second formant of the adjacent vowels is lowered which is not so in Monsang (see figure 4). Hence, we have called this articulation, for now, as a pre-closure vowel.

- | | | | | |
|------|-----------------------------------------------------------------------|---------------------|-------------------------------------------------------------------------|---------------------|
| (40) | /ápù/ [ápù] | ‘grandfather’ | /ap ^w u/ [ap ^w u] | ‘mother of animals’ |
| (41) | /bu/ [bu] | ‘add’ | /b ^w u/ [b ^w u] | ‘cooked rice’ |
| (42) | /tur/ [tuɪ] | ‘to take on credit’ | /t ^w ur/ [t ^w uɪ] | ‘push’ |
| (43) | /édúr/ [eduɪ] | ‘support’ | /ed ^w ur/ [ed ^w uɪ] | ‘low noise’ |
| (44) | /t ^h ur/ [t ^h uɪ] | ‘hide’ | /t ^h w ^w ur/ [t ^h w ^w uɪ] | ‘sour’ |
| (45) | /t ^u m/ [t ^u m] | ‘get down’ | /t ^u w ^w um/ [t ^u w ^w um] | ‘destruction’ |
| (46) | /be ^t h ^u m/ [be ^t h ^u m] | ‘put down’ | /be ^t w ^w um/ [be ^t w ^w um] | ‘wild yam’ |
| (47) | /kum/ [kum] | ‘year’ | /k ^w um/ [k ^w um] | ‘bend’ |
| (48) | /k ^h u/ [k ^h u] | ‘gossip’ | /k ^h w ^u / [k ^h w ^u] | ‘rain’ |
| (49) | /a ^m ur/ [a ^m h ^u ɪ] | ‘end part’ | /a ^m w ^w ur/ [a ^m w ^w uɪ] | ‘body hair’ |
| (50) | /nu/ [nu] | ‘repeat’ | /n ^w u/ [n ^w u] | ‘female’ |
| (51) | /ŋu/ [ŋ ^h u] | ‘push’ | /ŋ ^w u/ [ŋ ^h w ^u] | ‘to apply’ |
| (52) | /éǰú/ [éǰúʔ] | ‘pillar’ | /eǰ ^w u/ [eǰ ^w u] | ‘to put off fire’ |
| (53) | /avur/ [avuɪ] | ‘he/she heaps’ | /av ^w ur/ [av ^w uɪ] | ‘container’ |
| (54) | /su/ [su] | ‘do work’ | /s ^w u/ [s ^w u:] | ‘go out’ |

(55)	/zu/ [zu]	‘to rear’	/z ^w u/ [z ^w u]	‘wine’
(56)	/hum/ [hum]	‘body’	/h ^w um/ [h ^w um]	‘to gather’
(57)	/ru/ [ɾu]	‘burn’	/r ^w u/ [ɾ ^w u]	‘bamboo’
(58)	/ɾu/ [ɾ ^h u]	‘agree’	/ɾ ^w u/ [ɾ ^h wu]	‘rope’
(59)	/elum/ [elum]	‘warm’	/el ^w um/ [el ^w um]	‘flood’
(60)	/ɭu/ [ɭ ^h u]	‘bossom friend’	/ɭ ^w u/ [ɭ ^h wu]	‘to get in’

Unlike the movement of the lips in bilabial articulation, the lower lip—in pre-closure articulations—is raised higher, pushing slightly up the upper lip with some degree of frication. There is a clear articulatory distinction between pre-closure and non pre-closure consonants in Monsang, the position of the pre-closure lips position is given in figure (3). However, this phenomenon occurs only with vowel [u], so this becomes suspicious or unclear whether the pre-closure is triggered just by the vowel [u] which is a back rounded vowel or if this is labialisation with some frication only. Phonetically, this pre-closure phoneme is part of both the onset and the nucleus, and for now it is best to be treated as another vowel phoneme. Following Konnerth (2018), the pre-closure vowel phoneme is represented as /^wu/.



Figure 3. Lips captured while articulating the word [ap^wu] ‘mother of animals or birds’.

4.1.4 The diphthong /au/

There is one diphthong, /au/, in Monsang that occurs only in few words; until now, we could only find four words, which are shown below (61 to 64). The diphthong /au/ is phonetically realised as [əu]. The diphthong /au/ can also occur with other phonemes or morphemes as given below. The vowel /au/ can occur in initial, medial and final positions of the word.

(61)	<i>au</i>	[əu]	‘in-law’
(62)	<i>saupa</i>	[səu.pa]	‘wolf’
(63)	<i>t^hau</i>	[t ^h əu]	‘oil’
(64)	<i>zau</i>	[zəu]	‘sheep’

If syllable boundary is not marked, sequences of vowel hiatus could be confused with the diphthong /au/; see the word /a.u:r/ in example (67). Unlike diphthongs, vowel hiatus can be defined as sequences of vowels in which each vowel forms the nucleus of its own syllable, with no consonant in between.

The possible vowel sequences of hiatus are /e^s-/ or /i-/ + /o/, /i/ + /u/ and /a-/ + /u:/, which are given in (65) to (67).

- | | | | |
|------|--------------|---------|-------------------|
| (65) | <i>i.oŋ</i> | [i.ɔŋ] | ‘to sit’ |
| (66) | <i>i.u</i> | [i.u] | ‘trapped’ |
| (67) | <i>a.u:r</i> | [a.u:ɹ] | ‘he/she measures’ |

4.2 Acoustic analysis of vowels

4.2.1 Monophthongs

As mentioned in section 3, examples (1) to (12) are recorded to understand the acoustic property of the vowel, and the recorded sounds are annotated at phoneme level using Praat (Boersma and Weenink 2016). After annotation, the first three formants (f1, f2 and f3) at the vowel midpoint and the duration of the vowel are extracted using a Praat script. The vowel formants are then normalised using the Lobanov method and plotted using NORM (Thomas and Kendall 2007). In figure (4), the ellipses inside the plot indicate the standard deviation.

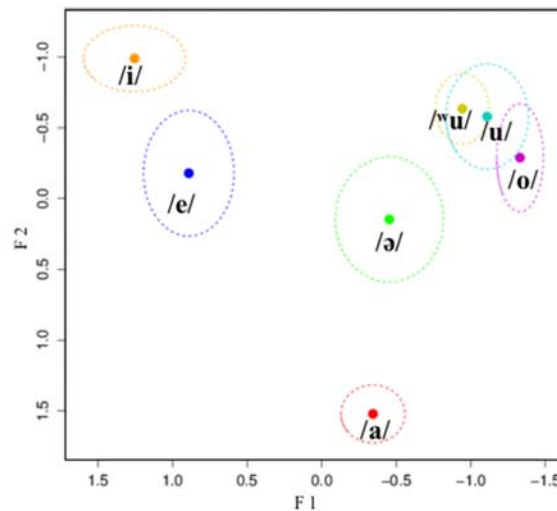


Figure 4. Lobanov normalised acoustic vowel space of one male speaker.

The acoustic result in figure (4) shows that the phoneme /ʷu/ is a close back protruded vowel that is closely located with the vowel /u/. As expected, the cue to differentiate the vowel /ʷu/ from the vowel /u/ as distinct phonemes is not the height (f1) and blackness of the tongue (f2). So, the better cue to show contrast between these two vowels is the pre-closure movement of the lips, as discussed in subsection (4.1.3). Considering the formant values, it is possible to say that the pre-closure vowel /ʷu/ is basically the high back rounded vowel /u/ if produced without the pre-closure movement of the lips. However, we see that the vowel /u/, unlike the pre-closure vowel /ʷu/, shows the largest vowel space among all the vowels, looking at the figure (4) and the standard deviation provided in table (1);

⁵ The nominaliser prefix /e-/ or /i-/ is in free variation in some of their initial occurrences.

we suspect that it is due to the pre-closure movement of the lips which has made the vowel space of the vowel /^wu/ smaller, unlike the vowel /u/ space. In regards to the other vowels, the position of the phonemes /ə/ and /a/ is seen more back comparatively, see figure (4). The unnormalised f1, f2 and f3 values of all the vowels are tabulated in table (1) with standard deviation (in parenthesis).

Vowel	F1 (Mel)	F2 (Mel)	F3 (Mel)
/i/	213(24)	887(53)	1022(57)
/u/	293(128)	618(159)	985(71)
/ ^w u/	249(25)	547(27)	1005(41)
/e/	307 (50)	805(63)	953(49)
/ə/	330(46)	629(56)	975(48)
/o/	285(39)	488(24)	1020(47)
/a/	471(57)	640(33)	963(59)

Table 1. Average vowel formants values

In addition, the phoneme /a:/, /i:/ and /u:/ are the three long vowels and occur in closed syllable as discussed in subsection (4.1.2). An example of the vowel /a/ and /a:/ for the word /baŋ/ ‘wall’ and /ba:ŋ/ ‘hang up’ is given in figure (5).

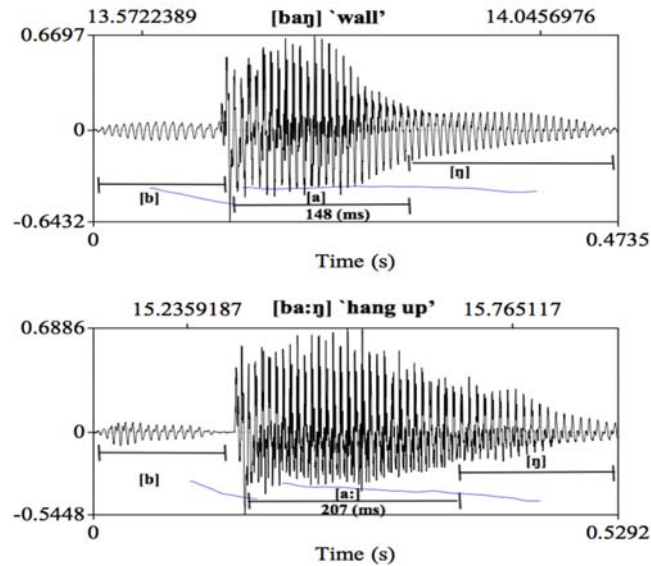


Figure 5. Acoustic waves illustrating the vowel length distinction for the vowel /a/ and /a:/ in the word [baŋ] ‘wall’ and [ba:ŋ] ‘hang up’ (values in ms).

4.2.2 Diphthongs

Diphthongs can be defined as having two vowel targets in the same syllable. A putative illustration for diphthong is as vowel glide; that is, the tongue first takes the position required for the articulation of a certain vowel and then glides towards the position required for the articulation of another vowel. To see the acoustic property of the phoneme /au/, the recorded data of (61) to (64) are selected. Using a Praat script, the first and the second formants (f1 and f2) are calculated, but the values were taken at 30% and 70% to know the trajectory of this vowel /au/ [əu]. Like in monophthongs, the vowel formants are then normalised using the Lobanov method and plotted using NORM (Thomas and Kendall 2007). Figure (6) represents the acoustic result of the vowel [əu]. The result shows that the glide starts near the vowel /ə/ and ends near the vowel /u/.

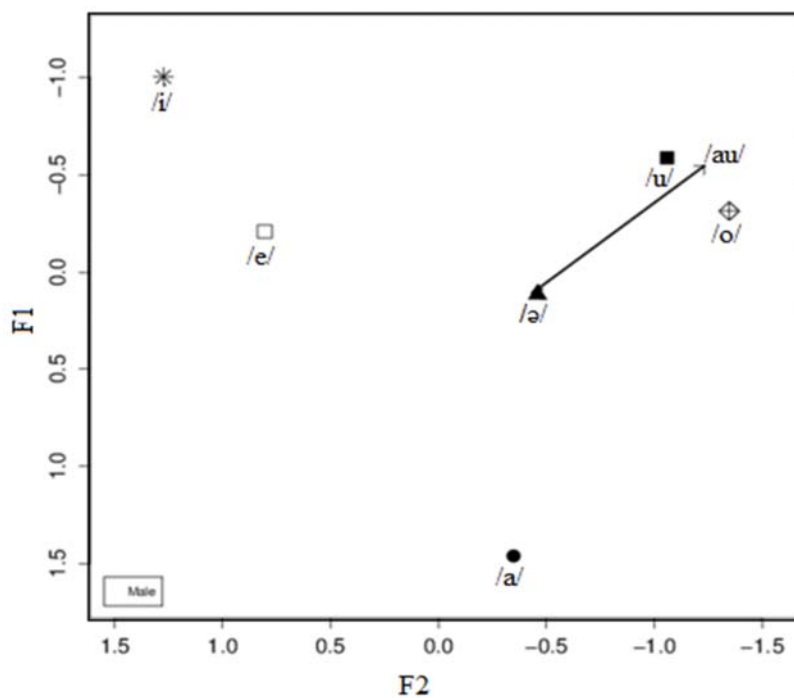


Figure 6. Diphthong /au/ [əu] vowel trajectory.

5 Consonants

Monsang has 24 phonemic consonants. These consonants are presented below, according to the place and manner of articulation in table (2).

	Bilabial	Labiodental	Alveolar	Retroflex	Velar	Glottal
Occlusives	p b		t d	ʈ	k	
	p ^h		t ^h	ʈ ^h	k ^h	
Nasals	m̩ m		ŋ n			ŋ
Fricative			s~ʃ	z~dʒ		h
Affricate			tʃ~tɕ			
Approximant		v~ʋ	ɹ~ɻ	r~ɻ		
Lateral			l̥	l		

Table 2. Consonant phonemes

The following minimal pairs demonstrate the phonemic status for all the consonant phonemes.

- (68) /p/ vs. /b/ *pé* ‘give’, *bé* ‘mouth’; *pá:r* ‘bloom’, *bá:r* ‘yam’
- (69) /t/ vs. /d/ *tè* ‘tame’, *dé* ‘tease’; *mìntìn* ‘taste’, *mìndìn* ‘think’
- (70) /p/ vs. /p^h/ *pé* ‘give’, *p^he* ‘valley’; *àpùm* ‘all’, *ap^hum* ‘blocked’
- (71) /t/ vs. /t^h/ *tá:ŋ* ‘out’, *t^ha:ŋ* ‘donate’; *tìn* ‘cut’, *t^hin* ‘put in’
- (72) /k/ vs. /k^h/ *kàr* ‘climb’, *k^hár* ‘think’; *ki:* ‘hand’, *k^hi:* ‘peel’
- (73) /t/ vs. /t̥/ *keta* ‘mine’, *kétà* ‘brother in relation with sister’; *éta:* ‘oven’,
eta: ‘crying’
- (74) /t^h/ vs. /t̥^h/ *t^hé* ‘food’, *t̥^he* ‘divide’; *t^há* ‘moon’, *t̥^ha* ‘beautiful’
- (75) /m/ vs. /n/ *amɔŋ* ‘short’, *anɔŋ* ‘his duty’; *émór* ‘unconscious’,
enor ‘wipe’
- (76) /n/ vs. /ŋ/ *nam* ‘press’, *ŋam* ‘stable’; *t^hin* ‘put in’, *t^hiŋ* ‘tree’,
- (77) /m/ vs. /m̩/ *mi* ‘people’, *m̩i* ‘fire’; *mi:* ‘banana’, *m̩i:* ‘eyes’
- (78) /n/ vs. /ŋ̩/ *ne* ‘younger sibling’, *ŋe* ‘ask’; *en^wur* ‘to wipe’, *eŋ^wur*
‘foolish’
- (79) /ʃ/ vs. /z/ *ʃár* ‘male’, *zar* ‘scatter’; *ʃǎ* ‘water’, *zǎ* ‘follow’
- (80) /ʃ/ vs. /s/ *ʃǎ* ‘water’, *sǎ* ‘ask’; *ʃi* ‘carry’; *si* ‘go’
- (81) /s/ vs. /z/ *sé* ‘keep’, *zè* ‘pluck’; *so* ‘punch’, *zo* ‘go downward’
- (82) /l/ vs. /r/ *lá* ‘take’, *rà* ‘flower’; *lam-* ‘comparative marker’, *ram* ‘land’
- (83) /v/ vs. /s/ *và* ‘come/go’, *sà* ‘eat’; *ve* ‘borrow’, *sé* ‘keep’
- (84) /s/ vs. /h/ *sà* ‘eat’, *ha* ‘teeth’; *sim* ‘distribute’, *him* ‘to nail’
- (85) /r/ vs. /ɹ/ *rər* ‘inner’, *ɹər* ‘say’; *rǎ* ‘line’, *ɹǎ* ‘axe’
- (86) /l/ vs. /l̥/ *la* ‘cotton’, *l̥a* ‘song’; *lá* ‘take’, *l̥ǎ* ‘field’

5.1 *Phonetic realization*

5.1.1 *Obstruents*

The phoneme /k/ in Monsang is a voiceless, unaspirated dorso-velar occlusive [k]. It can occur in word initial and medial positions.

- | | | | |
|------|------------|--------|------------|
| (87) | <i>ká</i> | [kʰáʔ] | ‘I’ |
| (88) | <i>ḡke</i> | [ḡke] | ‘leave/go’ |

The phoneme /kʰ/ is a voiceless, aspirated dorso-velar occlusive [kʰ], which can occur in word initial and medial positions as exemplified below.

- | | | | |
|------|-----------------|-------------|-----------|
| (89) | <i>kʰoḡə</i> | [kʰoḡə] | ‘evening’ |
| (90) | <i>mekʰonʷu</i> | [mʰekʰonʷu] | ‘widow’ |

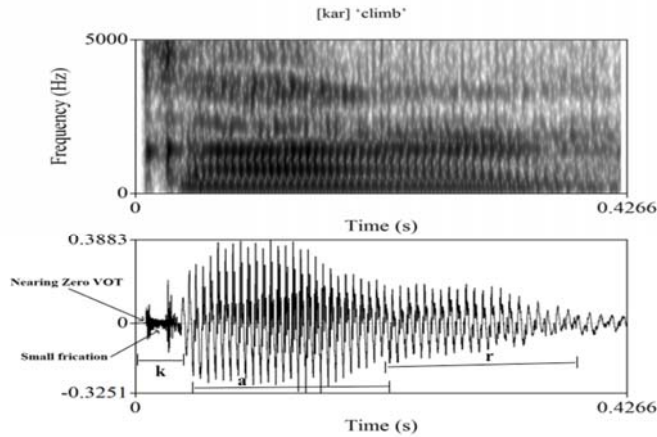


Figure 7. Spectrogram and acoustic waveform of the word [kai] ‘climb’, showing near zero voice onset time (VOT) for the sound [k].

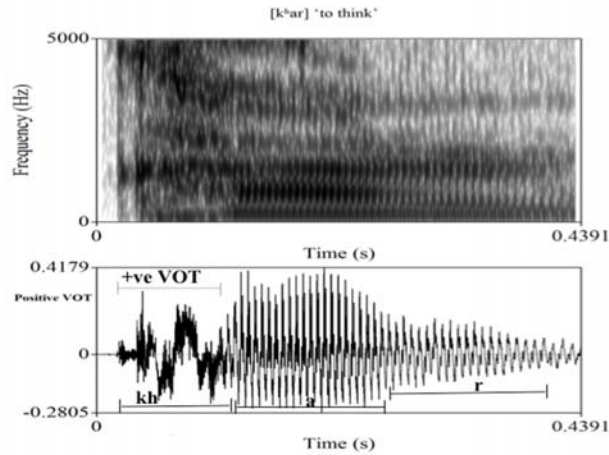


Figure 8. Spectrogram and acoustic waveform of the word [kʰar] ‘think’, showing positive voice onset time (VOT) for the sound [kʰ].

The phoneme /t/ is a voiceless, unaspirated apico-post-alveolar or retroflex occlusive [t]. The phoneme /t/ can occur in word initial and medial positions.

- (91) *ta* [ta] ‘brother in relation with sister’
 (92) *ŋtam* [ŋtam] ‘mustard leave’

The phoneme /tʰ/ is a voiceless, aspirated apico-post-alveolar or retroflex occlusive [tʰ]. It can occur in word initial and medial positions, not in the final position.

- (93) *tʰa:ŋtʰen* [tʰa:ŋtʰen] ‘mosquito’
 (94) *etʰa* [etʰa] ‘good’

Retroflexion is traditionally described as an articulation involving the bending backwards of the tongue tip; see, for instance, the definition by Trask (1996: 308). However, the tongue tip often fails to bend backwards in a retroflex in most of the languages that are described as retroflex sounds (Hamann 2003:39). In Monsang, the bending backwards of the tongue tip and the flapping is not observed, but retraction of the tongue. In figure (9) and (10), slight lowering of the third formant for the sounds [ta] and [tʰa] is evident due to retroflexion⁶.

⁶ Retroflexion is said to affect mainly higher formants, which are generally lowered (Ladefoged and Maddieson 1996: 27).

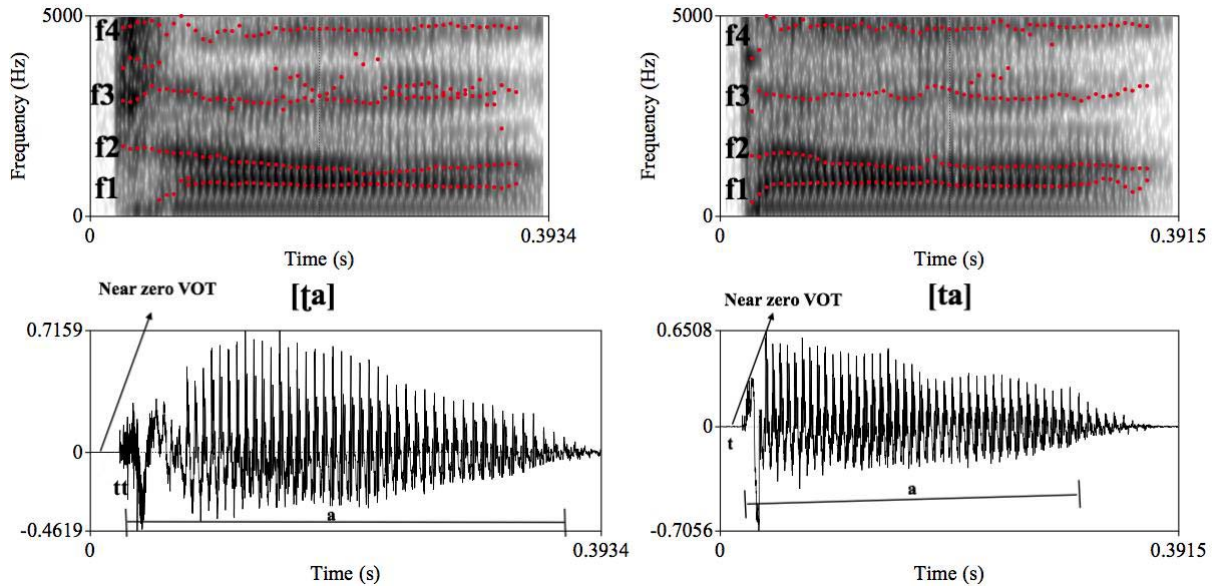


Figure 9. Spectrogram and acoustic waveform of the word *ta* 'brother' and *é-tá:* 'oven', showing near zero voice onset time of the sound [t] and [t]; lowering of the third formant is observed for the word *ta* 'brother'.

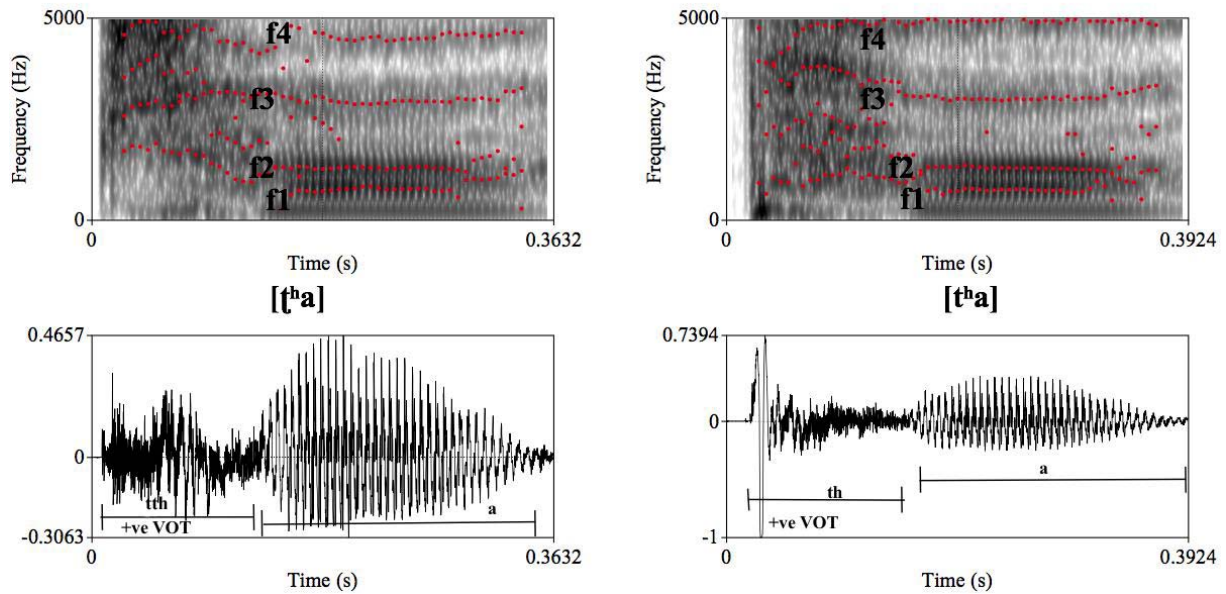


Figure 10. Spectrogram and acoustic waveform of the word *tʰa* 'beautiful' and *tha* 'moon', showing positive voice onset time of the sound [tʰ] and [tʰ]; lowering of the third formant is observed for the word *tʰa* 'beautiful'.

The phoneme /t/ is a voiceless, unaspirated alveolar occlusive [t], which is in free variation with the unaspirated dental occlusive. It can be attested in word initial and word medial positions.

- | | | | |
|------|--------------|---------|---------------|
| (95) | <i>ta:ŋ</i> | [ta:ŋ] | 'out/outside' |
| (96) | <i>àtèlè</i> | [àtèlè] | 'now' |

The phoneme /tʰ/ is a voiceless, aspirated alveolar occlusive [tʰ], and this phoneme occurs in word initial and medial positions.

- | | | | |
|------|--------------|---------|--------|
| (97) | <i>tʰàm</i> | [tʰàm] | ‘pray’ |
| (98) | <i>ŋtʰəŋ</i> | [ŋtʰəŋ] | ‘holy’ |

The phoneme /d/ is a voiced, unaspirated alveolar occlusive [d]. The phoneme /d/ occurs in word initial and medial positions.

- | | | | |
|-------|--------------|---------|------------------|
| (99) | <i>da</i> | [da] | ‘refuse’ |
| (100) | <i>bedor</i> | [bedoɾ] | ‘devour/swallow’ |

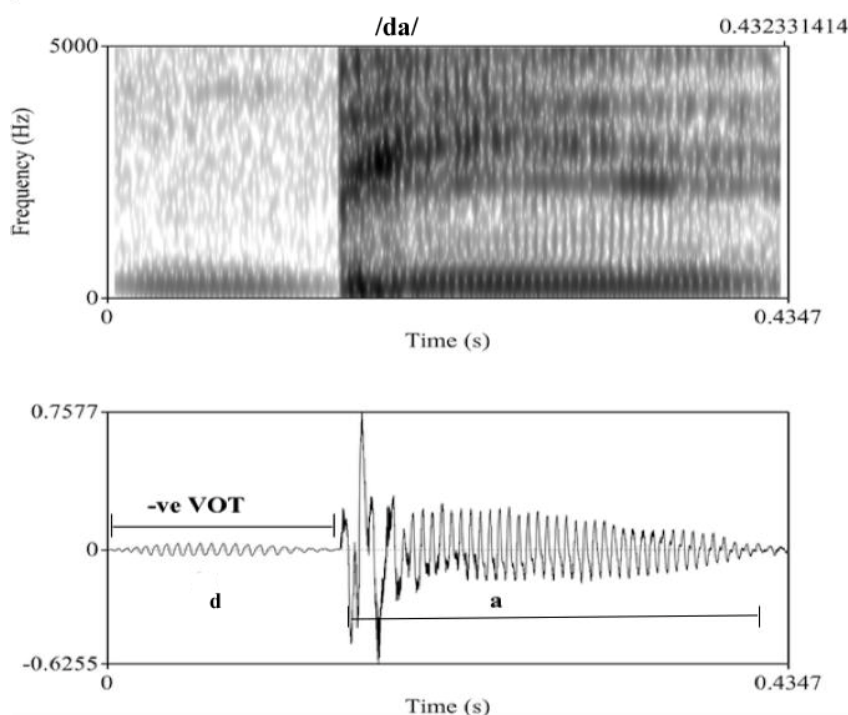


Figure 11. Spectrogram and acoustic waveform of the /da/ ‘refuse’, showing negative voice onset time (VOT) for the sound [d].

The phoneme /p/ is a voiceless, unaspirated, bilabial occlusive [p]. It occurs in word initial and medial positions.

- | | | | |
|-------|---------------|----------|-----------------|
| (101) | <i>pola:ŋ</i> | [pola:ŋ] | ‘bamboo basket’ |
| (102) | <i>àpáʔ</i> | [àpáʔ] | ‘father’ |

The phoneme /p^h/ is a voiceless, aspirated bilabial occlusive [p^h]. The phoneme /p^h/ can occur in word initial and medial positions.

- | | | | |
|-------|------------------------|----------------------|------------|
| (103) | <i>p^ham</i> | [p ^h am] | ‘position’ |
| (104) | <i>àp^há</i> | [àp ^h áʔ] | ‘time’ |

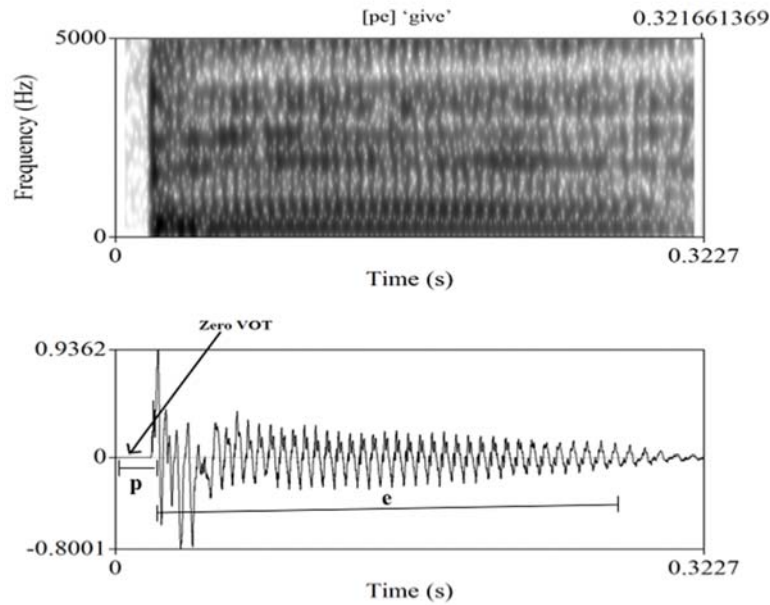


Figure 12. Spectrogram and acoustic waveform of the word /pe/ ‘give’ illustrating near zero voice onset time (VOT) for the sound [p].

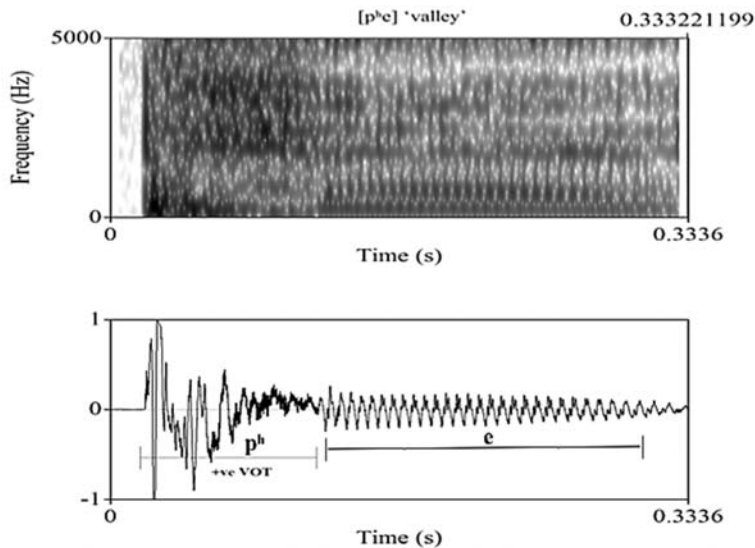


Figure 13. Spectrogram and acoustic waveform of the word /p^he/ ‘valley’, illustrating positive voice onset time (VOT) for the sound [p^h].

The phoneme /b/ is a voiced, unaspirated bilabial occlusive [b]. The phoneme /b/ can occur in word initial and medial positions.

- | | | | |
|-------|-------------|--------|------------------|
| (105) | <i>buŋ</i> | [buŋ] | ‘mountain’ |
| (106) | <i>abor</i> | [aboɿ] | ‘beginning/stem’ |

5.1.2 Nasals

The phoneme /m/ is a voiced, bilabial nasal [m], which can occur in word initial, medial and final positions.

- | | | | |
|-------|------------|--------|-------------------|
| (107) | <i>mi</i> | [mi] | ‘people’ |
| (108) | <i>ámá</i> | [ámáʔ] | ‘he/she, him/her’ |
| (109) | <i>hum</i> | [hum] | ‘body’ |

Phoneme /ᵐ/ is a voiceless, aspirated bilabial nasal [ᵐ^h], and /ᵐ/ occurs in word initial and medial positions. Based on the data recorded, the voiceless nasals appear to be slightly longer than the voiced nasals phonetically, see figure (14) and (15).

- | | | | |
|-------|-------------------------|------------------------------------|--------|
| (110) | <i>ᵐes^{wu}</i> | [ᵐ ^h es ^{wu}] | ‘face’ |
| (111) | <i>roᵐiŋ</i> | [roᵐ ^h iŋ] | ‘name’ |

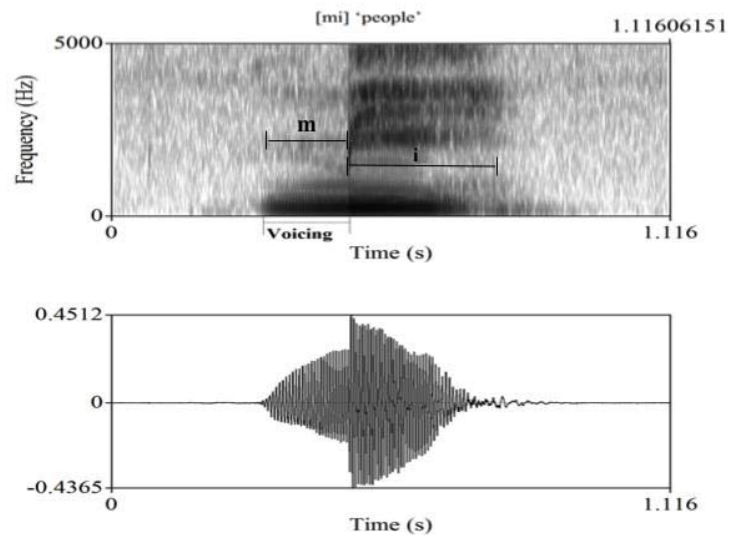


Figure 14. Spectrogram and acoustic waveform of the word /mi/ ‘people’ illustrating fully voiced [m] sound.

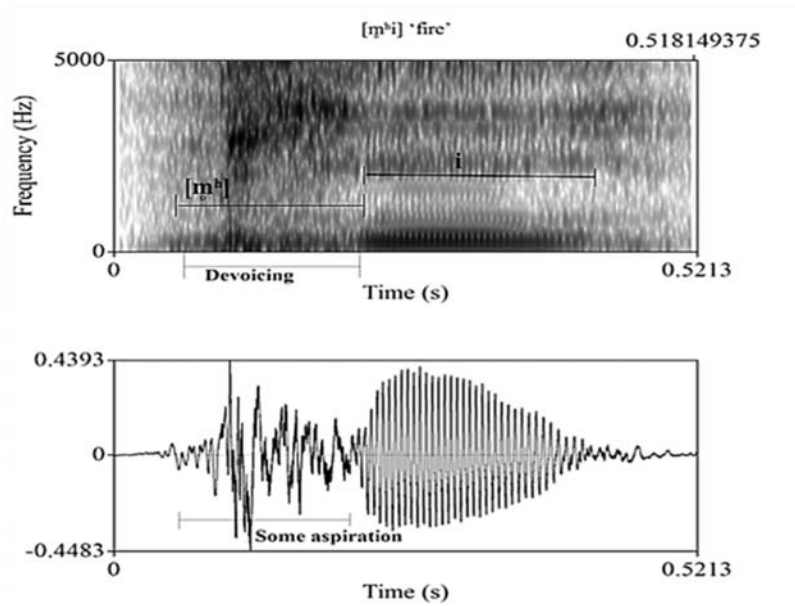


Figure 15. Spectrogram and acoustic waveform of the word /m̥i/ 'fire' illustrating devoiced [m̥] sound with a little property of aspiration.

The phoneme /n/ is a voiced, alveolar nasal [n]. The phoneme /n/ occurs in word initial, medial and final positions.

- | | | | |
|-------|------------|--------|-----------|
| (112) | <i>nər</i> | [nəɪ] | 'stand' |
| (113) | <i>inə</i> | [inə] | 'sun/day' |
| (114) | <i>ten</i> | [te:n] | 'run' |

The phoneme /ŋ/ is a voiceless, aspirated alveolar nasal [ŋ^h]. The phoneme /ŋ/ occurs in word initial and medial positions.

- | | | | |
|-------|-------------|----------------------|--------|
| (115) | <i>ŋa:r</i> | [ŋ ^h a:i] | 'nose' |
| (116) | <i>eŋum</i> | [eŋ ^h um] | 'wet' |

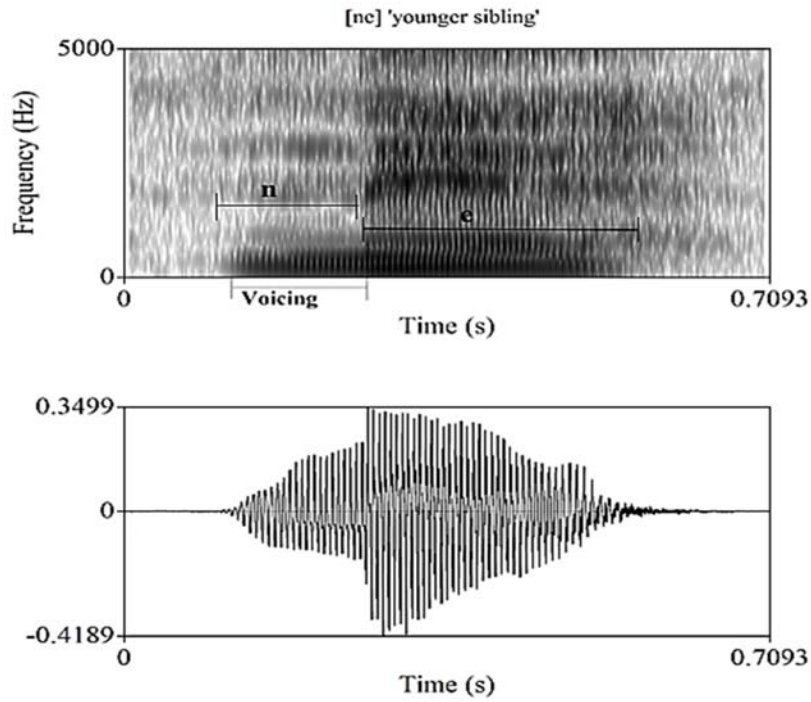


Figure 16. Spectrogram and acoustic waveform of the word /ne/ 'younger sibling' illustrating fully voiced, alveolar nasal continuant [n].

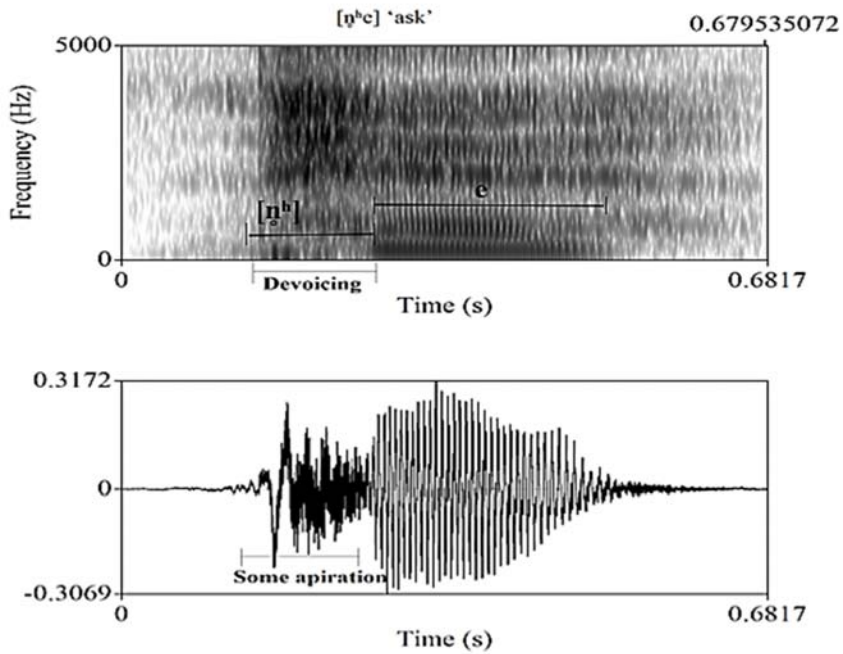


Figure 17. Spectrogram and acoustic waveform of the word /n̥e/ 'ask' illustrating devoiced [n̥^h] sound with some aspiration.

The phoneme /ŋ/ is a voiced, velar nasal [ŋ], which can occur in word initial, medial and final positions.

(117)	<i>ŋa</i>	[ŋa]	‘fish’
(118)	<i>eŋam</i>	[eŋam]	‘perpetual’
(119)	<i>besaŋ</i>	[besaŋ]	‘respond’

5.1.3 *Sibilants*

The phoneme /s/ is a voiceless, lamino-alveolar fricative, which may occur in word initial and medial positions; the phoneme /s/ is in free variation with the sound [ɕ] and [ʃ].

(120)	<i>sà</i>	[sà]	‘eat’
(121)	<i>pesar</i>	[pesaɾ]	‘boy’

The phoneme /z/ is a voiced, alveolar fricative [z] and the phoneme /z/ occurs in word initial and medial positions; the phoneme /z/ is in free variation with the sound [z~ʒ~dʒ~ʒ].

(122)	<i>zəŋ</i>	[zəŋ]	‘morning’
(123)	<i>azu</i>	[azu]	‘he/she rearing’

The phoneme /tʃ/ is a voiceless, alveolar affricate [tʃ], and occurs in word initial and medial positions. The phoneme /tʃ/ is in free variation with the sound [tɕ].

(124)	<i>tʃar</i>	[tʃaɾ]	‘male animal’
(125)	<i>etʃum</i>	[etʃum]	‘correct’

5.1.4 *Approximants and laterals*

The phoneme /l/ is a voiced, apico-alveolar, lateral approximant [l], and occurs in word initial and medial.

(126)	<i>la</i>	[la]	‘thread’
(127)	<i>alə</i>	[aləʔ]	‘middle’

The phoneme /lʰ/ is a voiceless, aspirated apico-alveolar lateral [lʰ], and occurs in word initial and medial positions.

(128)	<i>lʰam</i>	[lʰam]	‘road/way’
(129)	<i>loʰə</i>	[loʰə]	‘ground’

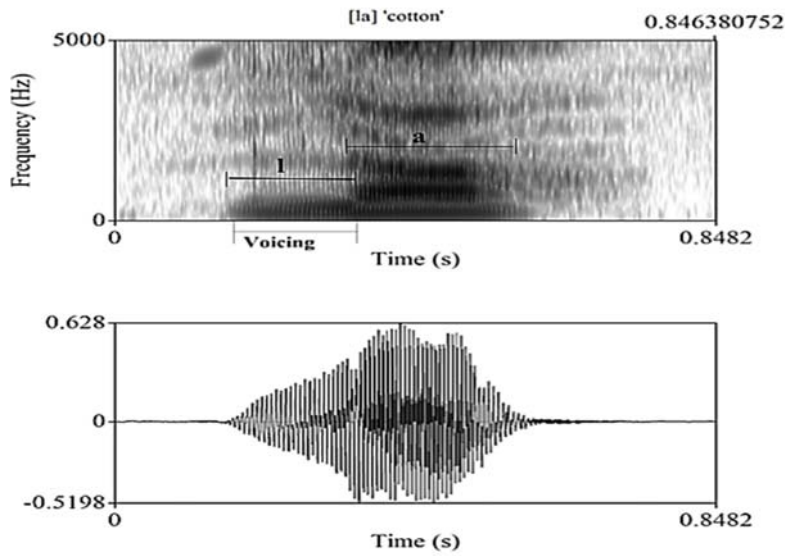


Figure 18. Spectrogram and acoustic waveform of the word /la/ 'cotton' illustrating the voicing of voiced, apico-alveolar, lateral approximant [l].

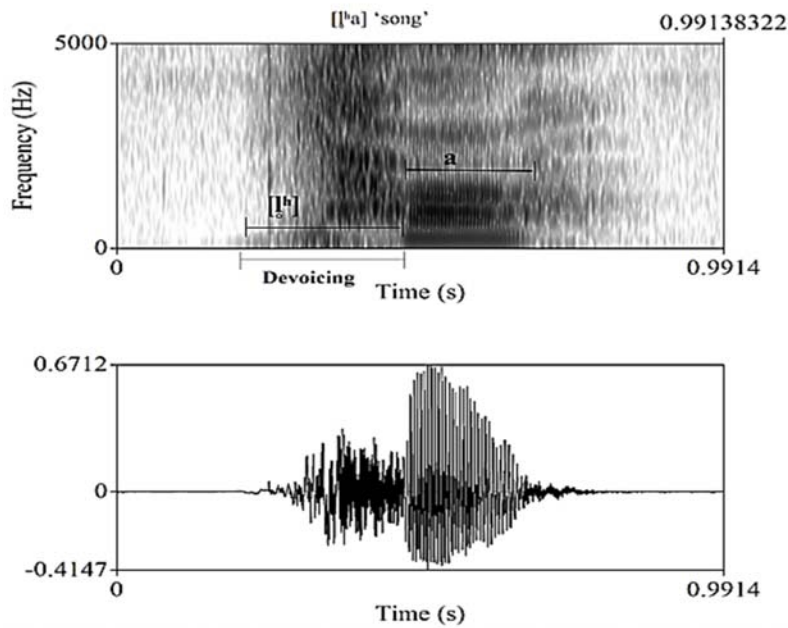


Figure 19. Spectrogram and acoustic waveform of the word /ʰa/ 'song' illustrating devoiced [ʰ] sound with a little property of aspiration.

The phoneme /r/ is a voiced, alveolar approximant [ɹ]. It can occur in word initial, medial and final positions.

- | | | | |
|-------|--------------------------|------------------------|----------|
| (130) | <i>rə</i> | [ɹə] | ‘flower’ |
| (131) | <i>érám</i> | [é.ɹám] | ‘feast’ |
| (132) | <i>ber^wur</i> | [be.ɹ ^w ur] | ‘snake’ |

The phoneme /ɹ/ is a voiceless, aspirated alveolar approximant [ɹ^h], and occurs in both word initial and medial positions.

- | | | | |
|-------|-------------|----------------------|---------|
| (133) | <i>ɹər</i> | [ɹ ^h əɹ] | ‘say’ |
| (134) | <i>aɹin</i> | [aɹ ^h in] | ‘chaff’ |

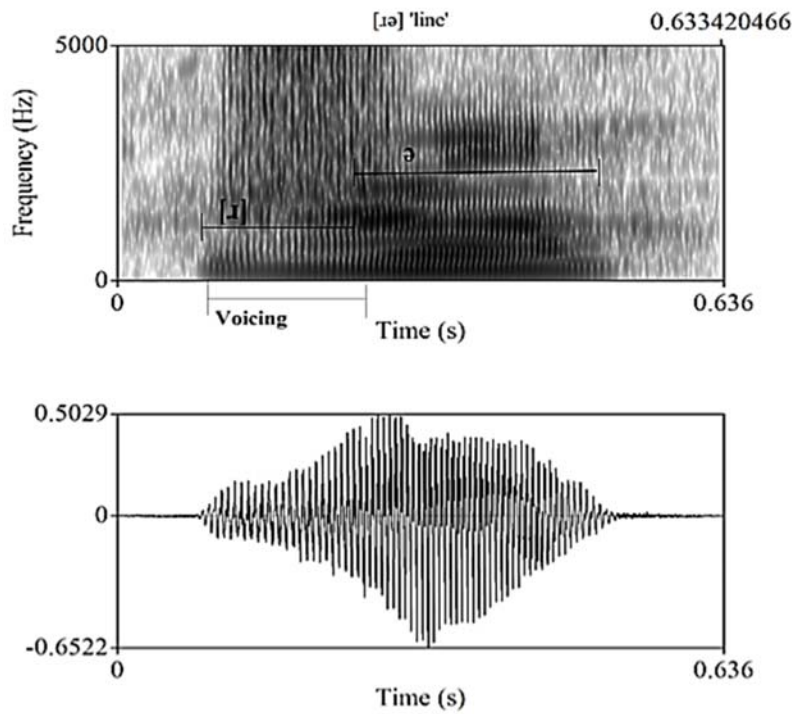


Figure 20. Spectrogram and acoustic waveform of the word /rə/ ‘line, demarcation’ illustrating the voicing of voiced, alveolar approximant [ɹ].

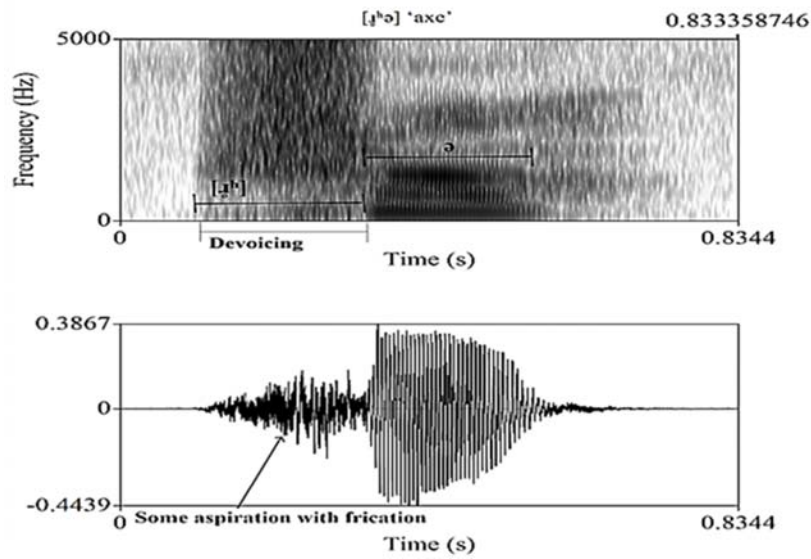


Figure 21. Spectrogram and acoustic waveform of the word /ɬə/ 'axe' illustrating the devoicing and aspiration of the sound [ɬʰ].

The phoneme /v/ is a voiced, labiodental approximant [v], which can occur in word initial and medial positions.

- (135) *và* [và] 'come/go'
 (136) *mímvé* [mímvéʔ] 'leech'

The phoneme /h/ is a voiceless, glottal approximant [h]. Phoneme /h/ can occur in word initial and medial positions.

- (137) *huŋ* [huŋ] 'come'
 (138) *rohɔɾ* [ɾohɔɾ] 'charcoal'

6 Syllable structure

A phonetic analysis of the constituents of the monosyllables is made before the syllables are determined (see table 3). In most cases, the phonetic constituents of a syllable in Monsang can maximally consist of three places⁷. The constituents of a maximal syllable in Monsang are:

- (i) One of the consonant initials: Onset (see table 3)
- (ii) One of the six vowels: Nucleus
- (iii) One of the five consonants finals: Coda

⁷ About 'place' in syllable see Firth and Roger (1937)

No syllable has more than three places. Minimally, a syllable can be just one nucleus (see table 4). Vowel length can occur both in open and close syllable. The phonotactic distribution of the syllable constituents is given in table (3). In addition, we should also note the diphthong /au/, which is a rare phoneme, that occurs only in four words in the corpus: *au* (VV) ‘in-law’, *sau₁pa* (CVV.CV) ‘wolf’ *t^hau* (CVV) ‘oil’ and *zau* (CVV) ‘sheep’. Examples of all the possible monosyllabic structures are provided in table (4). In addition, we have included all the possible syllable structures in Appendix (A).

Onset (C1)	Nucleus	Coda (C2)	Tone
p p ^h b d t t ^h t̪ t̪ ^h k k ^h m̥ m̥ n̥ n̥ s z t̪ v h l̪ l̪ r̪ r̪	i i: u u: e ə w u o a a:	m n ŋ r	High Low

Table 3. Phonotactic distribution of syllable constituents

Structure	Word	Gloss
V	<i>è</i>	‘cut’
V:	<i>i:</i>	‘excrement’
VV	<i>au</i>	‘in-law’
CV	<i>sá</i>	‘meat’
CV:	<i>ŋi:</i>	‘eye’
CVV	<i>zau</i>	‘sheep’
VC	<i>èr</i>	‘green’
CVC	<i>bin</i>	beat
CV:C	<i>bá:r</i>	‘yam’
CCVC	<i>bleŋ</i>	‘to lit’

Table 4. Examples of monosyllables

In Monsang, there are three syllabic nasals: *m̩*, *n̩* and *ŋ̩*. These syllabic nasals represent a full syllable, and they are restricted to occur only in word initial position. A few examples are given below in (139) to (146).

(139)	<i>n̩sà</i>	[n̩sà]	‘hot’
(140)	<i>n̩tà</i>	[n̩tà]	‘spill’
(141)	<i>n̩tà:r</i>	[n̩tà:r]	‘tight’
(142)	<i>m̩pà</i>	[m̩pà]	‘thin’
(143)	<i>m̩pì:</i>	[m̩pì:]	‘wide’
(144)	<i>m̩mò</i>	[m̩mò]	‘loss’
(145)	<i>ŋ̩ka:ŋ̩</i>	[ŋ̩ka:ŋ̩]	‘tall’
(146)	<i>ŋ̩hà:</i>	[ŋ̩hà:]	‘similar’

In addition, the phoneme /l/ and /r/ are found occurring in cluster (in three words in the corpus) where the first member is either /k/ or /b/. However, these occurrences are in free variation with the insertion of the vowel /e/ after the first consonant, as exemplified in (147) to (149).

(147)	<i>bleŋ</i>	[bleŋ ~ beŋ]	‘to lit’
(148)	<i>ti:ŋkleŋ</i>	[ti:ŋkleŋ ~ ti:ŋkeŋ]	‘ampit’
(149)	<i>abraŋ</i>	[abraŋ ~ abaŋ]	‘maternal uncle’

7 Tone

Like most of the Trans-Himalayan languages, Monsang is a tone language. From the data collected, we discovered two tones, which we called them as high tone and low tone; similarly, Konnerth (2018) has also mentioned about the presence of two tones in Monsang. While the presence of vowel quantity (or length) in Monsang has made even more challenging, in addition to limited data, to get correct minimal pairs. Initially, the long vowels were mistaken as high tone, and the short vowels as mid or low tone. For instance, initially the word *in* (toneless) ‘curry’ is understood as ‘low tone’ when compared with the word *í:n* (high tone) ‘house’. However, the word *in* (toneless) ‘curry’ is a toneless word, and the word *í:n* (high tone) ‘house’ is a ‘high tone’ word because the word *í:n* (high tone) ‘house’ contrasts with the word *ì:n* (low tone) ‘drink’, as they both have long vowels; according to Remijnsen (2014), such a system represents a greater challenge, because both the production and the perception of tone patterns depend on duration.

As mentioned in section (3), the minimal sets in table (5) are considered to show the acoustic property of the two tones. The tone-bearing unit (henceforth TBU) in Monsang is considered as the syllable. In the analysis, the tonal duration was measured from the tonal onset at the onset of TBU or the beginning of the vowel to the tonal offset at the end of the TBU. Figure (24) represents the average values of the tones in table (5) which are produced by one male speaker for three iterations using the carrier phrase (a); however, as mentioned earlier, the tokens spoken in isolations ‘X’ are only

considered to show the pitch tract of the two tones. In addition, figure (22) and (23) are provided to show the pitch track in single utterance, for the words *sá* ‘meat’ vs *sà* ‘eat’ and *bé* ‘mouth’ vs *bè* ‘marry’, respectively.

Word (High tone)	Gloss	Word (Low tone)	Gloss
/i:n/	‘house’	/i:n/	‘drink’
/rǎ/	‘line’	/rǎ/	‘flower’
/há/	‘abstain from’	/hǎ/	‘soup’
/tʰǎ/	‘blood’	/tʰǎ/	‘wind’
/rá:r/	‘beyond’	/rà:r/	‘war’
/sú:m/	‘ten’	/sù:m/	‘squeeze’
/tʰǎr/	‘iron’	/tʰǎr/	‘look around’
/bé/	‘mouth’	/bè/	‘marry’
/tʰé/	‘food, eatable’	/tʰè/	‘sticky’
/tʃǎ/	‘water’	/tʃǎ/	‘dig’
/sá/	‘meat’	/sà/	‘eat’

Table 5. Examples of tones

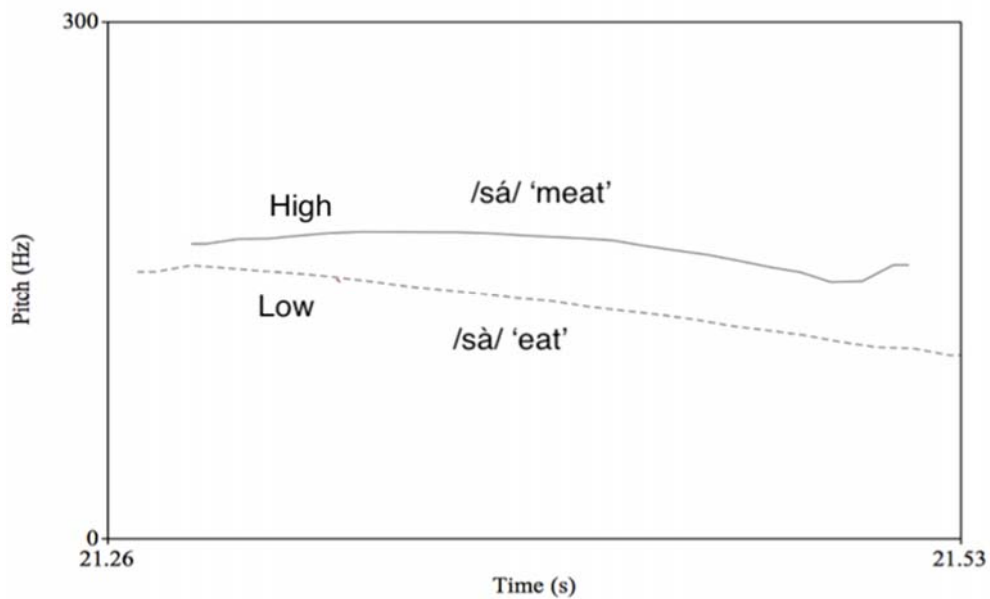


Figure 22. f0 value for the token /sa/ spoken by one male speaker in isolation

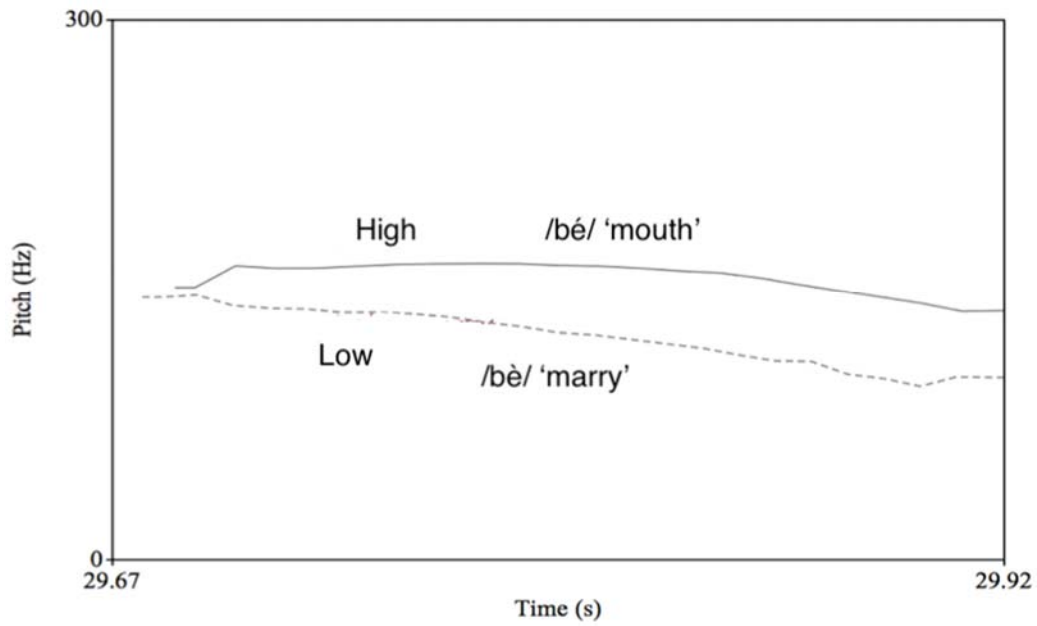


Figure 23. f0 value for the token /be/ spoken by one male speaker in isolation

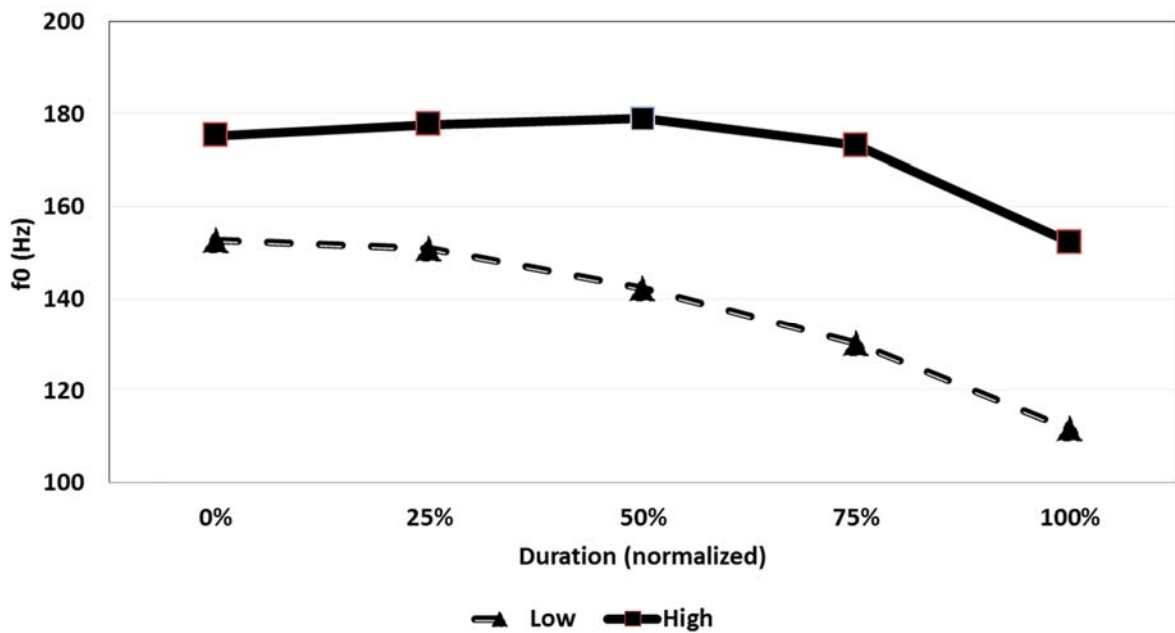


Figure 24. Average f0 values of the two tones in Monsang

The acoustic results show that there are two distinct tones in Monsang: High and Low. Phonetically, the two tones fall slightly at the end of the f0 duration (see figure 24). The average

duration values were taken at every 25% of the whole duration. This preliminary analysis shows that there are pitch contrasts only in limited words. Our next research work on tone will be, ‘How do the ‘toneless’ words surface in prosodic terms and the tone pattern in multi-syllabus or phrases?’

8 Summary

This paper presents a preliminary analysis of Monsang sound system, an understudied endangered language of northeast India. The study shows that Monsang has 24 consonant phonemes, 11 vowel phonemes (including the diphthong /au/ and the three long vowels) and two lexical tones. The canonical syllable structure observed for Monsang lexical items is (C1) V (C2) (Tone).

The consonant inventory of Monsang tends to be fairly typical, but we note that the presence of the retroflex stops is not reported in other Trans-Himalayan languages of the vicinity, except in Mizo (Fanai 1992:2) and Hmar (Veikho and Infimate 2016, Baruah and Bapui 1996). Similarly, the presence of the phoneme /^wu/ is unusual, if we are to consider that the six vowel system, /i e a o u ə/ in Tibeto-Burman languages in Northeast India is typical (Burling 2013; Teo 2014:111); another atypical vowel system is the presence of the vowel /y/ and the absence of the vowel /u/ in Poula (or Poumai Naga) (Veikho and Sarmah 2018), an Angami-Pochuri language of the Trans-Himalayan language subgroup spoken in Manipur. Burling (2003) notes that all the languages that he has encountered from the ‘eastern border’ region between India and Burma have at least three contrastive tones. However, Monsang has two tones only, which is unlike the other Kuki-chin language⁸.

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⁸ Works done in Kuki-Chin languages report more than two tones; Mizo has four tones (Weidert 1975, Chhangte 1993, Sarmah and Wiltshire 2010), Kuki-Thaadow has three underlying tones (Hyman 2007) and Hmar has three tones (Veikho and Infimate 2016, Baruah and Bapui 1996).

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APPENDICES

(A) Examples of syllable structures

V	<i>è</i>	‘cut’
V:	<i>i:</i>	‘excrement’
VV	<i>au</i>	‘in-law’
CV	<i>sá</i>	‘meat’
CV:	<i>ṃi:</i>	‘eye’
CVV	<i>zau</i>	‘sheep’
VC	<i>èr</i>	‘green’
CVC	<i>bin</i>	beat
CV:C	<i>bá:r</i>	‘yam’

Table 6. Examples of mono-syllables

V.CV	<i>u.ti</i>	‘dog’
V.CV:	<i>ṃ.pì:</i>	‘wide’
VC.CV	<i>oŋ.na</i>	‘sitting place’
V:C.CV	<i>a:r.n^wu</i>	‘duck’
CV.CV	<i>be.k^ha</i>	‘chin’
CVC.CVC	<i>haŋ.kar</i>	‘climb’
V.CVC	<i>e.t^har</i>	‘new’

V.CV:C	<i>e.da:ŋ</i>	‘yellow’
CVC.CV	<i>tʰim.pʰə</i>	‘needle’
CV:C.CV	<i>tʰa:ŋ.ki</i>	‘sickle’
CV.CVC	<i>ro.tʰin</i>	‘sweat’

Table 7. Examples disyllabic words

V.CV.CV	<i>ŋ̣.mè.nə</i>	‘they’
V.CV:.CV	<i>à.ti:.lè</i>	‘when’
V.CVC.CV	<i>à.dèr.nà</i>	‘under’
V.CV:C.CV	<i>è.zà:r.nà</i>	‘bed’
CV.CV.CV	<i>ro.tʰa.ŋ̣wu</i>	‘nerve’
CV:CV.CV	<i>ki:.be.za</i>	‘palm’
V.CV.CV:C	<i>i.ja.ʃa:m</i>	‘tribulation’
VC.CV.CVC	<i>in.be.kam</i>	‘curry cooking pot’
CV.CV.CVC/	<i>sa.rə.tʰə</i>	‘pimple’
CVC.CV.CVC	<i>ha.be.kam</i>	‘molar’ (tooth)

Table 8. Examples of trisyllabic words

V.CV.CV.CV	<i>a.zə.tu.na</i>	‘why’
V.CV.CVC.CV	<i>a.be.tʰəm.na</i>	‘beginning’
V.CVC.CV.CV:	<i>e.rwuŋ.le.pa:</i>	‘palace’
V.CV.CV.CVC	<i>i.na.be.swu</i>	‘lobule’

V.CVC.CV.CV *a.sem.be.sa* ‘creation’

Table 9. Examples of tetra syllabic words

(B) Additional wordlist⁹

	Orthography	Transcription	Gloss
1.	aba	/aba/ [aba]	branch
2.	abor	/abor/ [abo.ɪ]	beginning, stem
3.	abuwr	/ab ^w ur/ [ab ^w uɪ]	container
4.	ajenii	/azenə/ [azenə]	yesterday
5.	aleh	/alé/ [aléʔ]	upside down
6.	ale	/alè/ [alè]	he/she divert the way
7.	aliih	/aló/ [alóʔ]	middle
8.	ama	/ámá/ [ámáʔ]	he, she/ him,her
9.	among	/amon/ [amon]	short
10.	ang	/aŋ/ [aŋ]	fourth brother
11.	apa	/ápá/ [ápáʔ]	father
12.	apa	/ápà/ [ápà]	he/she reads
13.	apha	/áp ^h á/ [áp ^h áʔ]	time, hour
14.	apha	/áp ^h à/ [áp ^h à]	he/she reach
15.	aphum	/ap ^h um/ [ap ^h um]	blocked
16.	apu	/apu/ [apu]	grandfather
17.	apum	/apum/ [apum]	all, whole
18.	apuw	/ap ^w u/ [ap ^w u]	mother animal or bird
19.	arhin	/aɾin/ [aɾ ^h in]	chaff
20.	arhuwh	/aɾ ^w ù/ [aɾ ^w ùʔ]	empty
21.	atele	/àtèlè/ [àtèlè]	now
22.	atele	/á-té-lè/ [á-té-lè]	while he/she said ...
23.	ateele	/àti:lè/ [àti:lè]	when
24.	atenii	/atenə/ [atenə]	today
25.	atunii	/atunə/ [atunə]	tomorrow
26.	aar	/a:ɾ/ [a:ɾ]	chicken
27.	aang	/á:ŋ/ [á:ŋ]	shoulder
28.	aang	/à:ŋ/ [à:ŋ]	open mouth wide
29.	aasii	/a:sə/ [a:sə]	star

⁹ Tone is marked where tonemic distinction are known, but only few words are found to show tonemic contrast.

30.	aanhuw	/a:ŋ ^w u/	[a:ŋ ^{hw} u]	after
31.	baang	/ba:ŋ/	[ba:ŋ]	hang
32.	baar	/bá:r/	[bá:r]	yam
33.	baar	/bà:r/	[bà:r]	eat mouthful
34.	bang	/baŋ/	[baŋ]	wall
35.	be	/bé/	[bé]	mouth
36.	be	/bè/	[bè]	to speak to someone
37.	beh	/bé/	[béʔ]	third brother
38.	bechar	/beʃar/	[beʃaɪ]	forehead
39.	bedor	/bedor/	[bedoɪ]	swallow
40.	bejer	/bezer/	[bezeɪ]	split
41.	bejo	/bezo/	[bezo]	untie
42.	bekha	/bek ^h a/	[bek ^h a]	chin
43.	belang	/belan/	[belan]	open
44.	belii	/belə/	[belə]	tongue
45.	belungbesuwr	/beluŋbes ^w ur/	[beluŋbes ^w uɪ]	chest
46.	belungriir	/beluŋrɪr/	[beluŋɪɪ]	heart
47.	beresii	/beresə/	[beresə]	chili
48.	beruwr	/ber ^w ur/	[beɪ ^w uɪ]	snake
49.	besang	/besan/	[besan]	respond
50.	bettee	/beti:/	[beti:]	thunder ball
51.	betthum	/bet ^h um/	[bet ^h um]	put down
52.	betthuwm	/bet ^h wum/	[bet ^h wum]	wild yam
53.	bejuw	/bez ^w u/	[bez ^w u]	rat
54.	bi	/bí/	[bíʔ]	beans
55.	bi	/bi/	[bi]	short distance
56.	bin	/bin/	[bin]	beat
57.	bu	/bú/	[búʔ]	add
58.	buh	/bù/	[bù]	to put/pour on top
59.	bum	/bum/	[bum]	help
60.	bung	/buŋ/	[buŋ]	mountain
61.	buum	/bu:m/	[bu:m]	put in
62.	buw	/b ^w u/	[b ^w u]	cooked rice
63.	char	/ʃar/	[ʃaɪ]	male
64.	cheh	/ʃe/	[ʃéʔ]	can
65.	chi	/ʃi/	[ʃi]	carry
66.	chii	/ʃə/	[ʃə]	water
67.	chiih	/ʃǎ/	[ʃǎʔ]	chisel
68.	chiim	/ʃəm/	[ʃə:m]	fasten

69.	chung	/tʃuŋ/	[tʃuŋ]	above
70.	chuum	/tʃu:m/	[tʃu:m]	pour
71.	chuwr	/tʃ ^w ur/	[tʃ ^w uɪ]	fade
72.	da	/da/	[da]	refuse
73.	daa	/da:/	[da:]	to stay a bit far
74.	daar	/dɑ:r/	[dɑ:r]	thigh
75.	daar	/dɑ:r/	[dɑ:r]	metal gong
76.	de	/dè/	[dè]	tease
77.	de	/dé/	[déʔ]	cold
78..	dee	/di:/	[di:]	hip
79.	deen	/di:n/	[di:n]	have
80.	deeng	/di:ŋ/	[di:ŋ]	throw
81.	der	/der/	[deɪ]	below
82.	dim	/dim/	[dim]	bury
83.	doh	/do/	[do]	buttock
84.	dumdi	/dumdi/	[dumdi]	glow worm
85.	diirrhin	/dæɾrən/	[dæɪr ^h ən]	hip, waist
86.	dur	/dur/	[duɪ]	forbid
87.	duwh	/d ^w u/	[d ^w u]	bamboo mat
88.	echu	/etʃu/	[etʃu]	pillar
89.	echum	/etʃum/	[etʃum]	correct
90.	echuwr	/etʃ ^w u/	[etʃ ^w u]	extinguish
91.	edur	/edur/	[eduɪ]	support
92.	eduwr	/ed ^w ur/	[ed ^w uɪ]	low noise
93.	elaa	/ela:/	[ela:]	loose
94.	een	/i:n/	[i:n]	house
95.	een	/i:n/	[i:n]	drink
96.	elhuung	/eɭu:ŋ/	[eɭ ^h u:ŋ]	big
97.	elum	/elum/	[elum]	warm
98.	eluwum	/el ^w um/	[el ^w um]	flood
99.	emhong	/emɔŋ/	[em ^h ɔŋ]	open
100.	emong	/emɔŋ/	[emɔŋ]	short
101.	emor	/emor/	[emoɪ]	unconscious
102.	enhum	/eŋum/	[eŋ ^h um]	wet
103.	enhuwr	/eŋ ^w ur/	[eŋ ^h wuɪ]	foolish
104.	enor	/enor/	[enoɪ]	wipe
105.	enuw	/en ^w u/	[en ^w u]	we (inclusive)
106.	enuwr	/en ^w ur/	[en ^w uɪ]	wipe
107.	eriim	/erəm/	[e.rəm]	feast

108.	eriir	/erər/	[e.ɪəɪ]	hailstone
109.	eruw	/er ^w u/	[e.ɪ ^w u]	fish trap
110.	esii	/èsə/	[èsə]	long
111.	esiih	/ésá/	[ésáʔ]	spear
112.	esiih	/ésá/	[ésáʔ]	full
113.	esiih	/èsə/	[èsə]	cold
114.	esiing	/esəŋ/	[esəŋ]	small
115.	eta	/étá/	[étáʔ]	ours
116.	eta	/ètà/	[ètà]	dripping
117.	etaa	/étá:/	[étá:ʔ]	oven
118.	etaa	/ètà:/	[ètà:]	(we (incl)) ourselves
119.	ethuwr	/e ^h ur/	[e ^h uɪ]	fruit
120.	ettaa	/e ^t a:/	[e ^t a:]	crying
121.	ettha	/e ^t h ^a /	[e ^t h ^a]	good
122.	ettong	/è ^t òŋ/	[è ^t òŋ]	dry
123.	ettong	/é ^t óŋ/	[é ^t óŋ]	speaking
124.	ettum	/e ^t um/	[e ^t um]	getting down
125.	ettuwm	/e ^t wum/	[e ^t wum]	destruction
126.	ettuwr	/e ^t wur/	[e ^t wuɪ]	grass
127.	ha	/ha/	[ha]	teeth, tooth
128.	haa	/ha:/	[ha:]	wait
129.	him	/him/	[him]	to nail
130.	hong	/hoŋ/	[hoŋ]	heap
131.	hum	/hum/	[hum]	body
132.	hung	/huŋ/	[huŋ]	come
133.	huw	/h ^w u/	[h ^w u]	sound
134.	huwm	/h ^w um/	[h ^w um]	gather
135.	in	/in/	[in]	curry
136.	ina	/inà/	[inà]	ear
137.	ina	/inà/	[inà]	sick
138.	inii	/inó/	[inóʔ]	day, sun
139.	inii	/inè/	[inè]	we (incl)
140.	irur	/irur/	[i.ɪuɪ]	throat
141.	jar	/zar/	[zaɪ]	spread
142.	jè	/zé/	[zéʔ]	also
143.	jè	/zè/	[zè]	pluck
144.	jen	/zen/	[zen]	night
145.	jiing	/zəŋ/	[zəŋ]	morning
146.	juh	/zù/	[zu]	rear

147.	juung	/zu:ŋ/	[zu:ŋ]	monkey
148.	juw	/z ^w u/	[z ^w u]	wine
149.	ka	/ká/	[ká]	room
150.	kah	/ká/	[ká:ʔ]	shoot
151.	kam	/kám/	[kám]	bowl
152.	kam	/kàm/	[kàm]	close
153.	kar	/kar/	[kaɪ]	climb
155.	kee	/ki:/	[ki:]	hand
156.	keebeza	/ki:beza/	[ki:beza]	palm
157.	keechar	/ki:ʃar/	[ki:ʃaɪ]	forefinger
158.	keepuw	/ki:p ^w u/	[ki:p ^w u]	thumb
159.	kekuwng	/kek ^w uŋ/	[kek ^w uŋ]	shrimp
160.	keta	/keta/	[keta]	mine
161.	ketta	/keʈa/	[keʈa]	brother in relation with sister
162.	khar	/k ^h ár/	[k ^h áɪ]	think, choose
163.	khar	/k ^h àr/	[k ^h àɪ]	to spread something in order to block view
164.	khee	/k ^h i:/	[k ^h i:]	peel
165.	khi	/k ^h i/	[k ^h i]	leg
166.	khibekhong	/k ^h ibek ^h oŋ/	[k ^h ibek ^h oŋ]	heel
167.	khipuw	/khip ^w u/	[khip ^w u]	toe
168.	kholhii	/k ^h o _l ə/	[k ^h o _l ə ^h ə]	evening
169.	khu	/k ^h u/	[k ^h u]	gossip
170.	khuling	/k ^h uliŋ/	[k ^h uliŋ]	elbow
171.	khuw	/k ^h wù/	[k ^h wù]	rain
172.	ki	/ki/	[ki]	pull
173.	kii	/kə/	[kəʔ]	I, me
174.	kii	/kə/	[kə]	crack
175.	kinnuw	/kinn ^w u/	[kinn ^w u]	we (exclusive)
176.	kum	/kum/	[kum]	year
177.	kuum	/ku:m/	[ku:m]	harvest
178.	kuwm	/k ^w um/	[k ^w um]	bend
179.	la	/la/	[la]	thread
180.	lha	/l ^h a/	[l ^h a]	song
181.	lham	/l ^h am/	[l ^h am]	road, way
182.	lhii	/l ^h ə/	[l ^h əʔ]	field
183.	lhii	/l ^h ə/	[l ^h əʔ]	pour out
184.	lhu	/l ^h u/	[l ^h u]	bosom friend
185.	lhuwh	/l ^h wu/	[l ^h wu]	enter

186.	lii	/lɔ́/	[lɔ́ʔ]	take
187.	lii	/lɔ̀/	[lɔ̀]	deep water
188.	lolhii	/loɔ̃/	[loɔ̃ ^h ə]	ground
189.	luw	/l ^w ú/	[l ^w ú]	difficult
190.	luw	/l ^w ù/	[l ^w ù]	head
191.	luwh	/l ^w u/	[l ^w u:]	gather (clothes)
192.	mee	/mí:/	[mí:ʔ]	banana
193.	mee	/mì:/	[mì:]	peel
194.	mhee	/m̩í:/	[m̩í:ʔ]	eyes
195.	mhee	/m̩ì:/	[m̩ì:]	eat with
196.	mheemhuwr	/m̩i:m̩ ^w ur/	[m̩ ^h i:m̩ ^h w ^u r]	eyelash
197.	mhekxonuw	/m̩ek ^h on ^w u/	[m̩ ^h ek ^h on ^w u]	widow
198.	mhe	/m̩e/	[m̩ ^h e]	face
199.	mhi	/m̩i/	[m̩ ^h i]	fire
200.	mhuw	/m̩ ^w ú/	[m̩ ^h w ^u ʔ]	see
201.	mhuw	/m̩ ^w ù/	[m̩ ^h w ^u]	seed
202.	mi	/mi/	[mi]	people
203.	mimmhuw	/mím̩m̩ ^w í/	[mím̩m̩ ^h w ^u ʔ]	kite (bird)
204.	mimmhuw	/mím̩m̩ ^w ù/	[mím̩m̩ ^h w ^u]	know
205.	mimveh	/mím̩vè/	[mím̩vèʔ]	leech
206.	mimveh	/mím̩vè/	[mím̩vè]	cause to make less
207.	mindin	/míndín/	[míndín]	cause to make someone think
208.	mindin	/míndìn/	[míndìn]	think
209.	mintin	/míntín/	[míntín]	cause to make someone split something
210.	mintin	/míntìn/	[míntìn]	taste
211.	mmenii	/m̩méné/	[m̩ménéʔ]	they laughed at (somebody)
212.	mmenii	/m̩mènè/	[m̩mènè]	they
213.	mmenuw	/m̩men ^w u/	[m̩men ^w u]	they
214.	nam	/nam/	[nam]	press
215.	nang	/naŋ/	[naŋ]	you
216.	nepenuw	/nepen ^w u/	[nepen ^w u]	girl
217.	nga	/ŋa/	[ŋa]	fish
218.	ngke	/ŋke/	[ŋke]	leave, go
219.	ngnguh	/ŋŋu/	[ŋŋu]	perspire
220.	ngnguw	/ŋŋ ^w u/	[ŋŋ ^w u]	dossing
221.	nhaar	/ŋa:r/	[ŋ ^h a:r]	nose
222.	nhe	/ŋe/	[ŋ ^h e]	ask
223.	nhengbeeng	/ŋeŋbi:ŋ/	[ŋ ^h eŋbi:ŋ]	cheek

224.	nhengkhuung	/ŋeŋku:ŋ/	[ŋ ^h eŋku:ŋ]	lip
225.	nhu	/ŋu/	[ŋ ^h u]	push
226.	nhuw	/ŋ ^w u/	[ŋ ^h wu]	apply
227.	niir	/nər/	[nəɪ]	stand
228.	ninnuw	/ninn ^w u/	[ninn ^w u]	you (pl)
229.	nong	/noŋ/	[nɔŋ]	duty
230.	nsuwr	/ŋs ^w úr/	[ŋs ^w úɪ]	they caught
231.	nsuwr	/ŋs ^w ùr/	[ŋs ^w ùɪ]	long
232.	nthiing	/ŋt ^h əŋ/	[ŋt ^h əŋ]	holy
233.	nttam	/ŋtam/	[ŋtam]	mustard leave
234.	ntuwh	/ŋt ^w ú/	[ŋt ^w úʔ]	they found
235.	ntuwh	/ŋt ^w ù/	[ŋt ^w ù]	meet
236.	nuh	/nú/	[nu]	repeat
237.	nuw	/n ^w u/	[n ^w u]	female
238.	ong	/oŋ/	[ɔŋ]	sit
239.	paar	/pa:r/	[pa:ɪ]	live, bloom
240.	pe	/pe/	[pe]	give
241.	-pe	/-pè/	[-pè]	completive marker
242.	pesar	/pesar/	[pesaɪ]	boy
243.	pham	/p ^h am/	[p ^h am]	position
244.	phe	/p ^h e/	[p ^h e]	valley
245.	phuh	/p ^h u/	[p ^h u]	dig
246.	phuw	/p ^h wu/	[p ^h wu]	noise
247.	phuwr	/p ^h wúr/	[p ^h wúɪ]	grass
248.	polaang	/pola:ŋ/	[pola:ŋ]	bamboo basket
249.	puwh	/p ^w ú/	[p ^w úʔ]	borrow
250.	puwh	/p ^w ù/	[p ^w ù]	blast
251.	ram	/ram/	[ɹam]	land
252.	rhii	/r ^h é/	[r ^h éʔ]	axe
253.	rhii	/r ^h è/	[r ^h è]	to take someone along
255.	rhiih	/r ^h é/	[r ^h éʔ]	lice
256.	rhiir	/r ^h əɾ/	[r ^h əɪ]	say
257.	rhipuw	/r ^h imp ^w u /	[r ^h imp ^w u]	tiger
258.	rhu	/r ^h u/	[r ^h u]	agree, allow
259.	rhuw	/r ^h wu/	[r ^h wu]	rope
260.	rii	/rè/	[ɹè]	line, demarcation
261.	rii	/rə/	[ɹə]	flower
262.	riing	/rəŋ/	[ɹəŋ]	neck
263.	riir	/rəɾ/	[ɹəɪ]	inner, under

264.	rohor	/rohor/	[ɬoɦoɪ]	charcoal
265.	ruwthuwh	/r ^w ut ^{hw} u/	[r ^w ut ^{hw} u]	brain
266.	ru	/ru/	[ɹu]	burn
267.	ruw	/r ^w u/	[r ^w u]	bamboo
268.	ruwrpuw	/r ^w urp ^w u/	[r ^w u.rp ^w u]	python
269.	sa	/sá/	[sáʔ]	meat
270.	sa	/sa/	[sa]	eat
271.	sa	/sà/	[sà]	to imitate somebody
272.	sam	/sám/	[sám]	hair
273.	sam	/sàm/	[sàm]	missed (the bus)
274.	savuw	/sav ^w u/	[sav ^w u]	straw
275.	se	/se/	[se]	keep
276.	-se	/-sè/	[-sè]	perfective marker
277.	si	/si/	[si]	go
278.	sii	/sə/	[sə]	ask
279.	siih	/sá/	[sáʔ]	sand
280.	siih	/sà/	[sà]	remove clothe
281.	sim	/sim/	[sim]	distribute
282.	so	/so/	[so]	punch
283.	soh	/so/	[so]	vomit
284.	su	/su/	[su]	to work
285.	suh	/sú/	[súʔ]	dash against something
286.	sungruwkuwng	/sunɹ ^w uk ^w uŋ/	[sunɹ ^w uk ^w uŋ]	tortoise
287.	suwh	/s ^w u/	[s ^w u]	go out
288.	taang	/tá:ŋ/	[tá:ŋ]	out, outside
289.	taang	/tà:ŋ/	[tà:ŋ]	costly
290.	te	/té/	[téʔ]	say
291.	-te	/-tè/	[-tè]	allative marker
292.	ten	/ten/	[ten]	run
293.	tha	/t ^h á/	[t ^h áʔ]	moon
294.	tha	/t ^h à/	[t ^h à]	spread
295.	thaang	/t ^h a:ŋ/	[t ^h a:ŋ]	donate
296.	tham	/t ^h ám/	[t ^h ám]	to split something
297.	tham	/t ^h àm/	[t ^h àm]	pray
298.	the	/t ^h é/	[t ^h éʔ]	eatables, food
299.	the	/t ^h è/	[t ^h è]	kill
300.	thii	/t ^h ó/	[t ^h óʔ]	blood
301.	thii	/t ^h ə/	[t ^h ə]	wind
302.	thiir	/t ^h óɹ/	[t ^h óɪ]	iron

303.	thiir	/tʰər/	[tʰəɪ]	look around
304.	thin	/tʰin/	[tʰin]	put
305.	thing	/tʰiŋ/	[tʰiŋ]	tree, wood
306.	thing	/tʰiŋ/	[tʰiŋ]	to block something
307.	thingnha	/tʰiŋŋa/	[tʰiŋŋʰa]	leaf
308.	thu	/tʰu/	[tʰu]	drive
309.	thur	/tʰur/	[tʰuɪ]	hide
310.	thuw	/tʰwu/	[tʰwu]	rotten
311.	thuwr	/tʰwur/	[tʰwuɪ]	sour
312.	tin	/tin/	[tin]	cut
313.	to	/to/	[to]	cut
314.	toh	/tó/	[tóʔ]	third sister
315.	tta	/tʰa/	[tʰa]	brother in relation with sister
316.	ttha	/tʰa/	[tʰa]	good, beautiful
317.	tthaangtthen	/tʰa:ŋtʰen/	[tʰa:ŋtʰen]	mosquito
318.	tthe	/tʰe/	[tʰe]	divide
319.	tthuw	/tʰwum/	[tʰwum]	back of the body
320.	ttuwng	/tʰwŋ/	[tʰwŋ]	plank
321.	tur	/tur/	[tuɪ]	credit
322.	tuwr	/tʰur/	[tʰuɪ]	push
323.	upa	/upa/	[upa]	elder
324.	unen	/unen/	[unen]	sibling
325.	ung	/uŋ/	[uŋ]	yes
326.	uti	/uti/	[uti]	dog
327.	uung	/u:ŋ/	[u:ŋ]	shout
328.	uur	/u:r/	[u:ɪ]	measure
329.	va	/va/	[va]	come, go
330.	vattthuw	/vatʰwu/	[vatʰwu]	dove
331.	ve	/ve/	[ve]	borrow
332.	veh	/vé/	[véʔ]	to cultivate
333.	vin	/vin/	[vin]	belly
334.	vuw	/vʷú/	[vʷúʔ]	fart
335.	vuw	/vʷù/	[vʷù]	dress up