

PHONOLOGICAL SKETCH OF THE SIDA LANGUAGE OF LUANG NAMTHA, LAOS¹

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Abstract

This paper describes the phonology of the Sida language, a Tibeto-Burman language spoken by approximately 3,900 people in Laos and Vietnam. The data presented here are the variety spoken in Luang Namtha province of northwestern Laos, and focuses on a synchronic description of the fundamentals of the Sida phonological systems. Several issues of diachronic interest are also discussed in the context of the diversity of the Southern Loloish group of languages, many of which are spoken in Laos and have not yet been described in detail.

Keywords: Sida, Loloish, phonology, Laos

ISO 639-3 codes: slt

1 Introduction

This paper provides a first overview of the phonology of the Sida language [ISO: slt], a Tibeto-Burman language spoken in Northern Laos and Northern Vietnam. The data presented here are representative of one dialect spoken in Luang Namtha province of Laos.

1.1 The Sida language and its speakers



Figure 1 Sida migrations (Image from Google Earth)

According to the 2015 census of Laos, there are 3,151 ethnic Sida people in Laos, and it is believed that all speak the Sida language. There are Sida speakers in Vietnam as well, and the total of speakers in both countries has been estimated at around 3,900 (Lewis 2014). Sida is an officially recognized ethnic group in both countries.

In Laos, the group known by the exonym Sida or Sila, uses the autonym /wa³¹ɲ³¹/ or /wa³¹ɲ³⁵ a³¹mǎ³¹/. In traditional narrative, they refer to themselves as /ko⁵⁵yū⁵⁵ a³¹ja³¹/ ‘the children of Go Gue’, /ko⁵⁵yū⁵⁵/ being the maternal ancestor of all Sida people². The Sida language is known as /wa³¹ɲ³⁵ a³¹k^hjo³¹/ ‘Sida-mouth’ or /wa³¹ɲ³⁵ su³¹to³¹/ ‘Sida-language’.

¹ This paper is a revised version of a presentation given at SEALS 24 in Yangon in May 2014.

² The Akeu people in Kyaingtong (Myanmar), speaking a closely related language, also refer to themselves as /gɔ⁵⁵k^hu⁵⁵ nɛ⁵⁵dzu³⁵/ providing supplementary evidence that may be useful when making a broader study of the historical relationships between languages of this group.

The Sida in Namtha prefer to use ‘Sida’ as their ethnonym when speaking Lao. Figure 1 shows the general patterns of migration of the Sida since the 19th century, based on oral history collected in Luang Namtha and Phongsaly. The move from Phongsaly west to Luang Namtha was part of a large-scale movement of people fleeing unrest in the mountainous areas of the Lao-Vietnam border area (Badenoch and Tomita 2013). Edmondson (2002) confirms this, reporting that the Sila in Vietnam tell of leaving the Muang U and Muang La area of Phongsaly province in Laos about 175 years ago because of ‘harsh conditions and exploitation’.

The Sida of Luang Namtha now live in two adjacent villages. Ban Sida is the larger of the two, located at approximately two hours walk into the mountains from the main road. Their agricultural livelihoods are supported by rice and maize cultivation, and supplemented with sale of non-timber forest products. More recently, they have begun planting rubber.

The Sida in this area have had close relations with the Kim Mun and Mien, in addition to Yunnanese traders that frequented the area. In previous generations, it was common for Sida men to be fluent in Southwestern Mandarin and Mien, and have some competence in Lue or Nyuan, the Tai languages spoken in the Namtha valley. They have also been in contact with speakers of Pana, another small Tibeto-Burman language spoken near the Sino-Lao border in Luang Namtha. Currently, most Sida speak Lao or Lue, although fluency in Mandarin is limited to a few elderly men. Mien is no longer commonly spoken. Children born in Ban Nam Dii grow up trilingual, speaking Kim Mun and Lao in addition to Sida. Lao literacy is limited among the Sida. Recently there has been an influx of Sida migrants from Phongsaly province, where the majority of Lao Sida speakers live. All Sida children learn Sida as their first language, and it is used as the language of the household.

Interviews conducted during our fieldwork suggest that there are three main dialects spoken in Laos. In addition to the Sida spoken in Luang Namtha, there seem to be two varieties spoken in Phongsaly province, which could be thought of as Lower Phongsaly (Muang Samphanh and Muang Bun Nuea) and Upper Phongsaly (Muang Nyot Ou). The wordlists given in Kingsada and Shintani (1999), Shintani et al (2001) and Kato (2008) seem to support this, but more detailed fieldwork is required. In Luang Namtha, the Samphanh variety is considered to be a prestige dialect.

The data presented in this paper were collected in Ban Nam Dii, from four speakers in three age-groups: a 69-year old male, a 46-year old male, and his children, a 28-year old male and 23-year old female. The contact languages used in the fieldwork were Lao, Sida and Southwestern Mandarin Chinese.

1.2 Position within Tibeto-Burman

Although this is the first systematic look at the phonology of Sida, the existence of the language has been known for some time from short wordlists collected in Laos and Vietnam. Sida is a Tibeto-Burman language belonging to the Loloish branch of Lolo-Burmese. According to Bradley’s classification of Southern Ngwi (Loloish) languages, Sida falls into the Bi-Ka sub-group (Table 1).

Table 1: Bradley’s Southern Ngwi classification (2002)

Southern Ngwi		
<i>Akoid</i>	<i>Bi-Ka</i>	<i>Bisoid</i>
Akha	Kaduo/Katu	Bisu
Hani	Biyue/Piyo	Laomian
Haoni/Baihong	Muda	Sangkong
Akeu	Sila/Sida	Phunoi
Chepya	Phana	

The diversity of Tibeto-Burman languages in northern Laos is high (Shintani and Kato 2009), but we have only just begun to understand the breadth or depth of this linguistic complexity. In addition to Sida, related languages Paza (Phousang), Pana, Khir, and Muji spoken in Phongsaly, Oudomxay and Luang Namtha provinces will further expand Bradley’s Bi-Ka sub-group. A plethora of Akoid and Bisoid languages and dialects are also found, and these are spoken in relative geographic proximity.

2 Syllable structure

The canonical syllable structure in Sida is:

$$C_1(C_2)V(C_3)/T$$

C_2 is an optional medial (with limited phonemic distribution) and C_3 is an optional coda, and T is a tone. The cognate words in principle have open syllables. The details of the phonological system this structure governs are given below.

3 Consonants

Sida has 20 distinct consonant phonemes, differentiating four points of articulation and four manners of articulation. Table 3 gives the consonant inventory of Sida.

Table 3: Sida consonant inventory

	labial	alveolar-dental	palatal	velar
plosive	p	t	te	k
	p ^h	t ^h	te ^h	k ^h
fricative	f	s		x γ
nasal	m	n	ɲ	ŋ
approximate	w	l̥ l	j	

Contrastive pairs for consonant phonemes are given below:

/p/ vs. /p^h/: /pa³³la³³/ ‘moon’ vs. /e³¹p^ha³¹/ ‘leaf’
 /t/ vs. /t^h/: /ta³¹/ ‘to look at’ vs. /t^ha³³/ ‘PROHIBITIVE’
 /te/ vs. /te^h/: /te³¹/ ‘to have, to exist’ vs. /te^he³¹/ ‘to speak’
 /k/ vs. /k^h/: /ki⁵⁵lu⁵⁵/ ‘green’ vs. /a³¹k^hi⁵⁵/ ‘foot’
 /f/ vs. /s/: /fɔ³¹/ ‘to protect’ vs. /sɔ³¹/ ‘to study’
 /x/ vs. /γ/: /xu⁵⁵/ ‘gold’ vs. /γu⁵⁵/ ‘good’

/m/ vs. /n/: /m̩³¹/ ‘person’ vs. /n̩³¹/ ‘deep’
 /ɲ/ vs. /ŋ/: /ɲa⁵⁵/ ‘frost’ vs. /ŋa⁵⁵/ ‘salty’

/w/ vs. /j/: /wa³³/ ‘careless’ vs. /ja³¹/ ‘child’
 /l/ vs. /l̥/: /le³³wa³³/ ‘palm of hand’ vs. /l̥a³³/ ‘to fall down’

Unaspirated plosives /p/, /t/, /te/ and /k/ contrast with aspirated /p^h/, /t^h/, /te^h/ and /k^h/. In principle, unaspirated plosives are phonetically realized as voiced stops, although there is significant phonetic variability in the degree of voicing. Thus /p/ represents a phoneme that varies freely between [p] ~ [b]; the same holds true for the others as well. In his brief description of Sila spoken in Vietnam, Edmondson (2002) reported voicing contrasts /p/-/b/ and /k/-/g/, but remarked that there was no /d/ in the data to contrast with /t/. In addition to the observed voicing variability among speakers, we have found no minimal pairs to justify voicing as a contrastive feature in Sida plosives. Our own preliminary investigations of the closely related languages Paza, Pana and Muji further suggest that voicing is not phonemic for the Bi-Ka languages spoken in Laos.

There are two exceptions to this non-contrastive voicing generalization, as there is a voicing contrast in the velar fricative /x/-/γ/ and the alveolar lateral /l̥/-/l/. Phonetically, /l̥/ is realized as [l̥]. The historical sources of these phonemic pairs explain the contrast within the otherwise non-contrastive system, discussed further below (section 6.2).

The palatal nasal is noted as /ɲ/ although the phonetic realization is closer to [ɲ̟], with the blade of the tongue remaining at a short distance from the palate.

Examples of Sida consonant phonemes are provided in Appendix 1.

3.1 Onset/initial

All consonants can occur in initial position. Allophones of consonants are shown in Table 4. The labial nasal /m/ also occurs syllabically as [m̩], for example, /m̩⁵⁵/ ‘to do’, /m̩³¹/ ‘to say’.

Table 4: Consonant allophones³

phoneme	allophones
/tɛ/	[tɛ], [ts]
/tɛ ^h /	[tɛ ^h], [ts ^h]
/s/	[s], [ɕ], [ʃ]
/x/	[x], [h]
/w/	[w], [v]

3.2 Medial

Two approximates, /l/ and /j/, can occur in medial position in Sida words. Table 5 provides the medial combinations found in Sida.

Table 5: Medials

medial	combinations
/-j-/	/pj-/, /p ^h j-/, /kj-/, /k ^h j-/, /mj-/
/-l-/	/pl-/, /p ^h l-/, /ml-/

Medial /-j-/ follows only bilabial and velar stops, and the bilabial nasal. Medial /-l-/ is phonemically more limited, occurring only with the bilabials stops and the bilabial nasal. However, in the speech of young people, medial /-l-/ has merged with medial /-j-/, and in the next generation will disappear completely. For example, ‘silver, white’ is pronounced /p^hlu⁵⁵/ by people over 50 years of age, and /p^hju⁵⁵/ by the rest of the community. The same is true for /mla³¹/ ~ /mja³¹/ ‘arrow’, another etymon with a well-attested original medial /-l-/.

The presence of /-l-/ in Akoid languages was noted with surprise and interest by Hansson (1988) in the Akeu language of northern Thailand. The occurrence of /-l-/ in the Loloish languages of northern Laos is relatively widespread (Badenoch 2009) and interesting historically. Medials are discussed further in comparative and diachronic perspectives in section 6.

3.3 Coda

Coda in Sida words include /-p, -t, -k, -m, -n, -ŋ/, but are found only in words borrowed recently from Lao.

<i>sɛm⁵⁵lɛp⁵⁵</i>	‘for [person]’
<i>p^hɛ³¹sɛ³¹ɛŋ³¹kit⁵⁵</i>	‘the English language’
<i>ɛ⁵⁵tɛn³³</i>	‘teacher’
<i>nɛk⁵⁵xɔŋ³¹</i>	‘singer’
<i>tɛŋ⁵⁵tɛŋ⁵⁵</i>	‘only’

In speech of the older generations, coda are often neutralized to a creak on the preceding vowel.

³ Allophones of the phonemes /tɛ/, /tɛ^h/, /x/ and /w/ are in free variation, but realization of /s/ follows the phonetic rule: /s/ → [ɕ~ʃ]/_i.

4 Vowels

4.1 Monophthongs

Twelve simple vowels comprise the Sida vocalic space, making it more complex than many other Lolo-Burmese languages. The Sida vowel phoneme inventory is presented in Table 6, and examples are given in Appendix 2.

Table 6: *Sida vowel inventory*

i	y	ɯ	u
e	ø	ɤ	o
ɛ			ɔ
a		ɐ	

Front and back vowels have both unrounded and rounded opposition at close /i, y, ɯ, u/ and mid-close height /e, ø, ɤ, o/. There are no true central vowels. High vowels are often fricated, enhancing contrast with mid vowels. Allophones of the Sida vowels are summarized in Table 7.

Table 7: *Sida vowel allophones*

vowel phoneme	variation
/ɤ/	[ɤ]~[ə]
/ɐ/	[ɐ]~[a]
/a/	[a]~[æ]

The presence of two [a]-colored vowels is notable. In Akoid languages we do not find this contrast in the vowel inventory. In the Lolo-Burmese context, however, this contrast is found in Lianghe Achang (Burmish, spoken in Dehong, Yunnan; Shi 2009⁴), and Lolopho (Loloish, spoken in Muang Sing of Luang Namtha, Laos; Hayashi 2015). This is discussed in more detail below (section 6.4).

There is a two-way contrast, plain versus creaky, on all Sida vowels. The plain-creaky contrast is shown in /wa³¹/ ‘bamboo’ and /wə³¹/ ‘pig’. Other examples of well-known Lolo-Burmese etyma with a creaky vowel in Sida are /mjɛ³³/ ‘eye’, /p^hɤ³¹/ ‘to become’ and /nɛ³³/ ‘black’. In principle, creaky vowels are from Proto-Loloish final-stop coda. This phonation contrast is common in Southern Loloish languages. In intergenerational comparison, this vowel feature appears to be somewhat unstable, although younger speakers do distinguish plain-creaky in normal speech.

Vowel phonemes are contrasted as follows:

- /i/ vs. /e/ vs. /ɛ/: /pi³³/ ‘to win’ vs. /pe³³/ ‘to divide up’ vs. /pɛ³³jo³¹/ ‘dragon’
- /y/ vs. /ø/: /t^hy³¹/ ‘to spit out’ vs. /t^hø³¹/ ‘to wrap up’
- /ɯ/ vs. /ɤ/: /tu³¹/ ‘to hit’ vs. /tɤ³¹/ ‘to soak’
- /u/ vs. /o/ vs. /ɔ/: /t^hu⁵⁵/ ‘thick’ vs. /t^ho⁵⁵/ ‘to open a hole’ vs. /t^hɔ⁵⁵/ ‘number of times’
- /a/ vs. /ɐ/: /tɛa³¹/ ‘to eat’ vs. /tɛɐ³¹/ ‘to have, to exist’

Nasalized vowels exist as well, although their distribution is limited to Chinese borrowings and a very small number of Sida words of solid TB etymology, such as /a³¹ mũ³³/ ‘hair’.

⁴ This type of contrast in Lianghe Achang was also examined in Hayashi’s fieldwork carried out in 2005-2006.

4.2 Diphthongs

There are four diphthongs in Sida, but all have their sources in Tai or Chinese borrowings (Table 8).

Table 8: Sida Diphthongs

diphthong	variation
/ɿi/	mja ³¹ ɿi ⁵⁵ ‘eggplant’ < Lao
/ai/	te ^h ai ³¹ wɔ̃ ³³ ‘porcelain bowl’ < Chinese
/ao/	pjao ³³ ‘twelfth year of the calendar’ < Chinese
/oa/	soa ³¹ ‘classifier for pairs’ < Chinese

5 Tones

The tone bearing unit in Sida is the syllable, not the word. Sida has three lexical tonemes: /55/ high, /33/ mid and /31/ low falling. Examples of tone contrast include:

/i ³¹ te ^h o ³¹ /	‘hat; mountain’
/i ⁵⁵ te ^h o ³¹ /	‘water’
/i ³¹ ɲi ³³ /	‘yesterday’
/i ⁵⁵ ɲi ⁵⁵ /	‘this’
/ŋɔ ⁵⁵ /	‘1SG’
/ŋɔ ³¹ /	‘five’
/a ⁵⁵ p ^h i ³¹ /	‘grandmother’
/a ³¹ p ^h i ⁵⁵ /	‘chili-hot’

Additionally, there are two grammatical tones: /35/ mid-rising and /53/ high-falling. Grammatical tones can be considered tonal alternations caused by certain grammatical constructions. At this point we have identified three alternation patterns, although we believe more will emerge.

- a) possessive tonal alternation: 31 → 35

The first example of possessive tonal alternation is when a noun modifies another noun. For example, /wa³¹ɲɿ³¹/ ‘Sida’ undergoes a tone shift from 31 to 35 on the second element when combined with other words such as /a³¹k^hjo³¹/ ‘mouth’, /suɿ³¹to³¹/ ‘language; logic’ or /a³¹mɿ³¹/ ‘person’.

wa ³¹ ɲɿ ³⁵ suɿ ³¹ to ³¹	‘Sida language’
wa ³¹ ɲɿ ³⁵ a ³¹ k ^h jo ³¹	‘Sida language’
wa ³¹ ɲɿ ³⁵ a ³¹ mɿ ³¹	‘Sida person’

- b) possessive tonal alternation: 31 → 33

The second example of possessive tonal alternation is triggered using the possessive particle /kɔ³³/, which causes the previous 31 tone to assimilate to 33. For example, /a³¹ɲo³¹/ ‘3SG.NOM’ is realized as /a³¹ɲo³³/ in /a³¹ɲo³³ kɔ³³ a³¹pjo³³puɿ³¹/ ‘his book’.

- c) particle-induced tonal alternation: 55 → 53, 31 → 53

Post-verbal particles can also trigger tone alternations. For example, the stative verb /e³¹p^{hi}⁵⁵/ ‘to be spicy’ undergoes a tone alternation when the interrogative particle is changed from /a³¹/ to /wa³¹/.

e ³¹ p ^{hi} ⁵⁵ p ^{hi} ⁵⁵	a ³¹
spicy	Q
‘Is it spicy?’	

e ³¹ p ^{hi} ⁵⁵ p ^{hi} ⁵³	wa ³¹
spicy	Q
‘Is it spicy?’	

e ³¹ p ^{hi} ⁵⁵	ma ³¹	p ^{hi} ⁵⁵	wa ³¹
spicy	NEG	spicy	Q
‘It’s not spicy?’			

The same interrogative particle /-wa³¹/ produces a 53 tone on a preceding 31 tone as well, for example a question about degree.

k ^h e ⁵⁵ lo ³¹	ma ³¹	nɔ ³¹	a ³¹ ?
how much	NEG	hurt	Q
‘It doesn’t hurt very much?’			

k ^h e ⁵⁵ lo ³¹	ma ³¹	nɔ ⁵³	wa ³¹
how much	NEG	hurt	Q
‘It doesn’t hurt very much?’			

At this moment, it seems safe to say that the two tones /35/ and /53/ are not lexical, but rather grammatically induced tones. Hence, the functional load of these tones is relatively low in Sida phonology. It is interesting to note that Colloquial Burmese (CB) is also well known as a language with grammatically induced tone (creaky tone), though it is different in that CB creaky tone also functions as lexical tone (Okell 1969).

6 Discussion in diachrony

The discussion section addresses three areas of interest in the phoneme inventory, focusing on internal typological inconsistencies of the Sida system.

6.1 Medials

The history of medials in the Sino-Tibetan languages has been an issue of interest for some time.⁵ In Lolo-Burmese, the preservation of /-r-/ and /-l-/ in Old Burmese as /-j-/ has provided a useful point of comparison with the greatly reduced picture of medials in other well-known languages such as Akha and Hani. Hayashi’s (2010) description of medials in Youle Jino opened the door for a relook at the history of this part of the phonology of Loloish languages. Like Jino, Sida has a richer inventory of medials than Akha, with the Namtha variety preserving /-j-/ and /-l-/ as introduced above. Table 9 provides examples of medials in Namtha, with two other dialects provided for a comparative perspective.

⁵ The history of medials in Burmese provides some clues for investigation of this phenomenon in Lolo-Burmese languages, though the medials of each language will have developed independently. Regarding Burmese medials, see Nishi (1976).

Table 9: Sida medials

gloss	Luang Namtha	Nyot-Ou (Kato 2008)	Bun Nuea (Kingsada and Shintani 1999)
eye	<i>mjɛ</i> ³³	<i>mja</i> ³³	<i>mja</i> ⁵⁵
face	<i>mjɛ</i> ³³ <i>p^hjo</i> ³¹ <i>mjɛ</i> ³³ <i>p^hlo</i> ³¹	<i>mja</i> ³³ <i>phlu</i> ²¹	<i>mja</i> ⁵⁵ <i>phro</i> ²¹
thigh	<i>a</i> ³¹ <i>p^hja</i> ³¹ <i>a</i> ³¹ <i>p^hla</i> ³¹	(<i>p^hɔ</i> ³³)	
delicious	<i>mja</i> ⁵⁵	<i>mra</i> ⁵⁵	<i>mlɔ</i> ⁵⁵
money/silver	<i>p^hju</i> ⁵⁵ <i>p^hlu</i> ⁵⁵	<i>phlu</i> ⁵⁵	<i>phlu</i> ⁵⁵

The data show that there are two sources of /-j-/ in Namtha Sida. The first is a historical /-j-/ as in /mjɛ³³/ ‘eye’. The second is a merger of /-l-/ or /-r-/ with /-j-/ as in /p^hju⁵⁵/ ‘money/silver’. The Phongsaly dialects of Sida (Nyot-Ou and Bun Nuea) appear to be even more conservative, although at the same time it seems that the liquid medial is quite unstable. Other related languages spoken in Phongsaly, such as Paza and Khir, share this conservative feature, possibly retained as part of a regional dynamic where these languages have had close contact with each other and conservative Bisoid languages, and less contact with Lao or Lue.

This picture can be cleaned up and expanded with a broader comparison with Jino and Written Burmese, cross-checked with Matisoff’s (2003) PLB reconstructions. Table 10 gives examples of Sida /-j-/, illustrating an old merger of */-y-/ and */-r-/.

Table 10: Historical sources of Sida /-j-/

Matisoff (2003) PLB	gloss	Sida	Jino (Hayashi 2010)	Written Burmese	Old Burmese
*bya	bee	<i>bja</i> ³¹	<i>pjə</i> ⁵⁵ ~	<i>pyā</i>	<i>pyā</i>
*myak	eye	<i>mjɛ</i> ³³	<i>mja</i> ³³ ~	<i>myak ci</i>	<i>myak</i>
*byam	to fly	<i>pɛ</i> ⁵⁵	<i>prɛ</i> ⁴²	<i>pyam̄</i>	<i>pyam̄</i>
*brwak	to speak	<i>pu</i> ³¹	<i>pja</i> ⁴²	<i>pro</i>	
*mraŋ	high	<i>mjo</i> ⁵⁵	~ <i>mjo</i> ⁵⁵	<i>mrañ’</i>	<i>mrañ’</i>
*mraŋ	horse	<i>mjo</i> ³¹	<i>mjo</i> ⁵⁵	<i>mrañḥ</i>	
*kruk	six	<i>khjɔ</i> ³¹	<i>khjo</i> ⁵⁵	<i>khrok</i>	<i>khrok</i>

Reflexes of PLB */-l-/ indicate a newer merger, originally derived from /-r-/ as supported by evidence from WB and Jino (Table 11).

Table 11: Sources of Sida /-l-/

Matisoff (2003) PLB	gloss	Sida	Jino (Hayashi 2010)	Written Burmese	Old Burmese
*plu	white	<i>phlu</i> ⁵⁵ / <i>phju</i> ⁵⁵	~ <i>phru</i> ⁵⁵	<i>phrū</i>	<i>phlū</i>
*blen	pus	<i>plu</i> ⁵⁵ / <i>pju</i> ⁵⁵	<i>pru</i> ⁵⁵	<i>prañ</i>	
*bliŋ	full	<i>plu</i> ³³ / <i>pju</i> ³³	~ <i>pru</i> ⁴⁴	<i>prañ’</i>	<i>plañ’</i>
*lyak	to lick	<i>mjɛ</i> ³¹	<i>mrə</i> ⁵⁵	<i>lyak</i>	
*klyoŋ	river	<i>lɛ</i> ³¹ / <i>lɛ</i> ³¹	~ <i>khri</i> ⁵⁵	<i>khyoñḥ</i>	<i>khloñ</i>
*kləy	feces	<i>lɛ</i> ⁵⁵	~ <i>khri</i> ⁵⁵	<i>khyeḥ</i>	<i>khliy</i>
*kla	to fall	<i>la</i> ³³	<i>krɔ</i> ⁴⁴	<i>kya</i>	<i>kla</i>
*gla/*kla	to hear	<i>kja</i> ³¹	<i>kjɔ</i> ⁵⁵	<i>krāḥ</i>	<i>krā</i>

These data show that Written Burmese and Jino attest an /-r-/ at the PLB stage, at least following bilabial initials, itself a shift from PLB */-l-/ if we accept Matisoff’s reconstruction. In Sida, this medial has now begun to shift to a glide medial. Another historical development from PLB is a process *velar + /-l-/ >

velar + /-r-/ rhotacization in Jino, not attested in WB, and suggesting that this happened after the split of Burmese and Loloish (Hayashi 2010). This ultimately resulted in a voiceless lateral in contemporary Sida.

6.2 Voiceless lateral

The presence of a voiceless lateral in the consonant inventory of Sida, contrasting with the voiced /l/, creates an asymmetry in what is otherwise a relatively straightforward system. The distribution of the Sida voiced lateral is interesting for the consideration of medials at the Proto-Loloish stage. In addition to the correspondences discussed above, PLB */kl-/ and */gl-/ > Sida /l-/ for many, but not all instances.⁶ For instance, in Sida /tɛ^hq³¹/ ‘cold’ we see the development */gl-/ > /tɛ^h-/ in a process of palatalization. The full set of tokens from our data set is presented with Proto-Loloish reconstructions from Bradley (1979) where available⁷, in Table 12.

Table 12: Examples of voiceless lateral in Sida

Sida	Bradley (1979) Proto-Loloish	Gloss	Notes
l ^o ³¹ tɛ ^q ³¹		bridge	
i ⁵⁵ l ^o ⁵⁵		clan leader	
l ^u ³³		main house beam	
l ^o ³¹		classifier for long cylindrical objects	
a ³¹ l ^o ⁵⁵ p ^h e ³¹	*klo ‘inside’	inside	Jino khjo ⁵⁵ ~
a ³¹ l ^o ⁵⁵ l ^o ⁵⁵		to bore a hole (bird)	Jino ~khru ⁵⁵ ‘hole’
l ^o ³¹	*ko ‘steal’	to steal, to do something secretly	Jino khju ⁵⁵
l ^o ³¹ p ^j o ³¹	*ʔ-kroŋ ‘throat’	throat	Jino khju ⁵⁵ ~
l ^a ³³	*gla ‘fall’	to fall down, to go down (non- volitional)	Jino kro ⁴⁴
l ^a ³¹		to get cut	
l ^a ³¹		clay	
a ³¹ l ⁱ ⁵⁵	*ʔk(l)e ‘excrement’	animal feces	Jino ~khri ⁵⁵
tɛ ^h a ³³ l ⁱ ³¹	*ʔ-krwe ‘sweat’	sweat	Jino khi ⁵⁵
a ³¹ l ^ɛ ³³		cell of beehive	

The full history of Sida medials remains to be elaborated. There seem to be several trajectories of medial development, but at this point we suggest that the four paths of medial change presented by Hayashi (2010) for Jino – rhotacization/yodization, emerging, dropping/affrication and palatalization – seem to be at work in Sida as well⁸.

6.3 Vanishing *r

Another phonemic differentiation in the voicing of consonants is between /x/ and /ɣ/, the other asymmetry in the Sida consonant inventory. The occurrence of /ɣ/ is limited, coming only before /tu/, and traced to Proto-Loloish */r-/. For example, Sida /ɣu⁵⁵/ ‘to laugh’ < *ray, /ɣu³¹/ ‘big’ < *əri, and /ɣu³¹/ ‘bone’ < *ʃə-ro. In all of these examples, the younger generation has /Ø/ as an allophone of /ɣ/. This means that this last trace of *r is following the normal development of this historical phoneme, which is *r > Ø; for example /ɔ⁵⁵/ ‘fontanelle’ < *ra, /i⁵⁵/ ‘water’ < *re, /ɣ³³/ ‘to obtain’ < *ra, /ɣ³³/ ‘chicken’ < *k-rak, and /k^hu⁵⁵/ ‘to arrive’ < *k-rok. In a few other instances, we see the development *r > j, such as /jɔ⁵⁵/ ‘strength’ < *ra and /jɔ⁵⁵/ ‘hundred’ < *C-ra, as can be seen in the development of Colloquial Burmese. Sida /j/ is normally derived from Proto-Loloish *y.

⁶ Some exceptions can be found, such as: ‘to hear’ PLB. gla/kla > Sida kja³¹.

⁷ Bradley (1979)’s reconstructed PL forms are used here because there are more cognate forms available.

⁸ This will be explored in more detail in a forthcoming paper by the authors.

6.4 /a/ and /ɐ/

As mentioned in Section 4.1 the presence of contrasting /a/ and /ɐ/ vowels can be considered atypical of an Akoid language, although the phenomenon is not without evidence in Lolo-Burmese. At this point, there is no obvious internal conditioning factor at work, although our data suggest that /ɐ/ occurs more frequently with glottalization, while /a/ occurs more frequently with clear voice. However, this is just a general trend in the data, with a significant degree of variation. In searching for an answer, we looked at the possibility of an historical explanation, for example the potential for influence from a final *-k, which could be related to the creakiness. The data did not hold up convincingly. We also looked to data on Sida dialects in Phongsaly, and found that in those there are three vowels, /a/, /ɐ/, and /ə/, which loosely correspond to Namtha /a/ and /ɐ/. For example, Namtha /a/ corresponds with Phongsaly /ə/ (or /ɐ/, /a/), Namtha /a/ corresponds to Phongsaly /a/, Namtha /ɐ/ corresponds to Phongsaly /ɐ/, Namtha /ɐ/ corresponds with Phongsaly /ɐ/.

A more thorough comparative analysis is required to clarify the vowel correspondences, but in the context of this synchronic description of Namtha Sida, it seems reasonable to say that there is a merger under way, where /ɐ/ is merging with /a/. It is interesting that the merger is on the more fronted /a/, which is arguably less common typologically. While /ɐ/ is merging with /a/ in native Sida words, /ɐ/ is retained in the phonemic space of Sida through Chinese and Lao loanwords, which are not subject to this putative vowel merger. The language contact situation in Luang Namtha is much more complex than in Phongsaly, and this needs to be taken into future consideration of the changes under way in the Sida dialect spoken in our research site. There is no obvious source of an influence that would favor /a/ over /ɐ/ in the surrounding languages, which suggests that more subtle forces are at work.

6.5 Historical source of Sida tones

The historical source of the three lexical Sida tones is relatively transparent, traceable back to Proto-Loloish (Bradley 1979). Sida 55 tone is the reflex of PL high tone *1, 31 is from PL low tone *2 and 33 is from PL mid tone *3. Bradley explains the PL mid tone as a secondary development from a two-tone system. The Sida 33 tone is much less common than 55 and 31 tones, indicating support for this development.

- 55 < *1 /te^hi⁵⁵/ ‘barking deer’ < *kye¹
 31 < *2 /o³¹k^ha³¹/ ‘head’ < *u²
 33 < *3 /a³¹mu³³/ ‘feather, body hair’ < *ʔ-mwe³

Creaky vowels seem to contrast on high/mid and low tones only, and for the most part can be traced back to a high/low (H/L) contrast on consonant-final Proto-Loloish syllables.

- creaky vowel 31 /a³¹teu³¹/ ‘wrist, elbow’ < *C-dzik^L
 /wa³¹/ ‘pig’ < *wak^L
 creaky vowel 33 /ɛ³³/ ‘chicken’ < *k-rak^H
 /ŋɛ³³su³¹/ ‘banana’ < *ŋak^H

7 Summary

This paper has provided an introductory sketch of the foundations of Sida phonology, based on our fieldwork with speakers of the Sida as spoken in Luang Namtha. We have provided examples from synchronic, comparative and diachronic perspectives to highlight some of the interesting aspects of the language. The loss of voicing as a distinctive contrast in the plosives of Lao Sida seems to be indicative of a larger trend in the Bi-Ka languages. At the same time a voicing contrast in the velar fricative and alveolar lateral has appeared, although the voiced velar fricative is in the process of disappearing. Sida also provides insights on the historical question of medials in Tibeto-Burman. This work will provide the foundation for more in depth studies of the Sida lexicon, syntax, and comparative-historical analysis of the lesser-known Tibeto-Burman languages of the Laos-Yunnan border area.

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Abbreviations

PL: Proto-Loloish, PLB: Proto-Lolo-Burmese, SG: singular

References

- Badenoch, Nathan. 2009. Preliminary Phonological Observations on the Paza Language of Northern Laos, paper presented at 42nd International Conference on Sino-Tibetan Languages and Linguistics, Payap University, Chiang Mai, 2-4 2009.
- Badenoch, Nathan and Tomita Shinsuke. 2013. Mountain People in the Muang: Creation and Governance of a Tai Polity in Northern Laos, *Southeast Asian Studies*, 2(1):29-67. https://englishkyoto-seas.org/wp-content/uploads/SEAS_0201_Badenoch_and_Tomita.pdf.
- Bradley, David. 1979. *Proto-Loloish*. Scandinavian Institute of Asian Studies Monograph Series, London: Curzon.
- Bradley, David. 2002. The subgrouping of Tibeto-Burman, in Beckwith (ed) *Medieval Tibeto-Burman Languages: PIATS 2000: Tibetan studies; proceedings of the ninth seminar of the International Association for Tibetan Studies*, Leiden 2000, EJ Brill.
- Edmondson, Jerold A. 2002. The Central and Southern Loloish Languages of Vietnam, *Proceedings of the Twenty-Eighth Annual Meeting of the Berkeley Linguistics Society: Special Session on Tibeto-Burman and Southeast Asian Linguistics*, p. 1-13.
- Government of Lao P.D.R. 2005. Results of the 2005 Population Census. Vientiane: Department of Statistics.
- Hansson, Inga-Lill. 1988. Akhə Akha and Pahi Akha – two little known Burmese Yipho languages, paper presented at the 21st International Conference on Sino-Tibetan Languages and Linguistics, 5-9 October 1988, University of Lund.
- Hayashi, Norihiko. 2010. Medials in Youle Jino and Proto-Tibeto-Burman, paper presented at 17th Linguistic Circle for the Study of East Eurasian Languages, Aoyama Gakuin University, 4 July 2010.
- Hayashi, Norihiko [林範彦]. 2015. Lolopho-go Onron no Yobi-teki Kenkyuu. 「口口・ポ語音論の予備的研究」 In Masayuki Ohnishi, Tida Syuntaro and Yuma Ito (eds.), *Chikyuken Gengo Kijutsu Ronshu 7*: 171-205. Kyoto: Research Institute for Humanity and Nature. (Preliminary research on the phonology of Lolopho, in *RIHN Descriptive Linguistics*). http://lg.let.kumamoto-u.ac.jp/kijutsuken/ronsyu/7/10_hayashi_all.pdf.
- Kato, Takashi. 2008. *Linguistic Survey of Tibeto-Burman Languages in Lao P.D.R.* Tokyo: Research Institute for Languages and Cultures of Asia and Africa.
- Kingsada, Thongphet and Shintani Tadahiko. 1999. *Basic Vocabularies of the Languages spoken in Phongxaly, Lao P.D.R.* Tokyo: Research Institute for Languages and Cultures of Asia and Africa.
- Lewis, M. Paul, Gary F. Simons, and Charles D. Fennig (eds.). 2014. *Ethnologue: Languages of the World, Seventeenth edition*. Dallas, Texas: SIL International.
- Matisoff, James A. 2003. *Handbook of Proto-Tibeto-Burman*. Berkeley: University of California Press.
- Nishi, Yoshio. 1976. Medials in Burmese. In Mantaro Hashimoto (ed.), *Genetic Relationship, Diffusion, and Typological Similarities of East and Southeast Asian Languages*, 15-29. Tokyo: Japan Society for the Promotion of Science.
- Okell, John. 1969. *A Reference Grammar of Colloquial Burmese. Vol. I*. London: Oxford University Press.
- Shi, Jian. [时建] 2009. *Lianghe Achang-yu Cankao Yufa*. 《梁河阿昌语参考语法》 (*Reference Grammar of Lianghe Achang*). Beijing: Zhongguo Shehui Kexue Chubanshe.
- Shintani, Tadahiko [新谷忠彦] and Kato Takashi [加藤高志]. 2009. Gengo to Minzoku. 「言語と民族」 In Tadahiko Shintani (et. al. eds.), *Tai-Bunkaken no Naka no Raosu*. 『タイ文化圏の中のラオス』 : 130-203. Tokyo: Keiyusya. (Language and Ethnicity, in *Laos in the Tai Cultural Area*)

Shintani, Tadahiko, Kosaka Ryuichi and Kato Takashi. 2001. *Linguistic Survey of Phongxaly, Lao P.D.R.*
Tokyo: Research Institute for Languages and Cultures of Asia and Africa.

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Appendix 1: Sida consonants

Stops

/p/	/pe ³¹ / [be ³¹]	fog
	/a ⁵⁵ pu ³¹ / [a ⁵⁵ bu ³¹]	father
	/pa ³³ la ³³ / [bæ ³³ læ ³³]	moon
	/e ⁵⁵ pe ³¹ / [e ⁵⁵ pe ³¹]	grandfather
	/e ³¹ po ⁵⁵ / [e ³¹ bo ⁵⁵]	tree
/t/	/ta ³¹ / [dæ ³¹]	to look at
	/tɔ ³³ / [tɔ ³³]	to come out
	/to ⁵⁵ / [to ⁵⁵]	to drink
	/ty ³³ / [dy ³³]	to put on clothes
	/tɛ ³³ / [tɛ ³³]	to ascend
/k/	/ko ³¹ p ^h ɛ ³¹ / [go ³¹ p ^h ɛ ³¹]	vegetable
	/ki ⁵⁵ lu ⁵⁵ / [ki ⁵⁵ lu ⁵⁵]	green
	/a ⁵⁵ kɛ ³¹ / [a ⁵⁵ kɛ ³¹]	grave
	/ky ³¹ / [gy ³¹]	nine
	/kɔ ⁵⁵ / [gɔ ⁵⁵]	rice plant
/p ^h /	/to ³¹ p ^h u ⁵⁵ / [do ³¹ p ^h u ⁵⁵]	buttocks
	/e ³¹ p ^h a ³¹ / [e ³¹ p ^h a ³¹]	leaf
	/p ^h ɔ ³³ / [p ^h ɔ ³³]	to roast
	/e ⁵⁵ p ^h i ³¹ / [e ⁵⁵ p ^h i ³¹]	grandmother
	/p ^h jɛ ³¹ / [p ^h jɛ ³¹]	to be broken
/t ^h /	/t ^h a ³³ / [t ^h æ ³³]	PROHIBITIVE
	/t ^h u ³¹ / [t ^h u ³¹]	one
	/mi ³³ t ^h ɛ ³¹ / [mi ³³ t ^h ɛ ³¹]	sky, heavens
	/t ^h o ³¹ / [t ^h o ³¹]	to pound
	/t ^h ɔ ³¹ / [t ^h ɔ ³¹]	to wrap
/k ^h /	/a ³¹ k ^h i ⁵⁵ / [a ³¹ k ^h i ⁵⁵]	foot
	/e ³¹ k ^h ɛ ³¹ / [e ³¹ k ^h ɛ ³¹]	hard
	/a ³¹ k ^h ɔ ³³ / [a ³¹ k ^h ɔ ³³]	skin
	/k ^h ɔ ⁵⁵ / [k ^h ɔ ⁵⁵]	to be all gone
	/k ^h u ³¹ ta ³³ / [k ^h u ³¹ da ³³]	spoon

Affricates

/tɛ/	/tɛ ³¹ / [tɛ ³¹]	to have, to exist
	/mjɛ ³³ tɛi ⁵⁵ / [mjɛ ³³ dzi ⁵⁵]	eye
	/tɛw ³¹ / [dzw ³¹]	itchy
	/tɛi ⁵⁵ / [dzi ⁵⁵]	beautiful, nice
	/tɛo ⁵⁵ / [dzo ⁵⁵]	to live at, to be at
/tɛ ^h /	/tɛ ^h ɛ ³¹ / [ts ^h ɛ ³¹]	to speak
	/tɛ ^h o ³¹ p ^h i ⁵⁵ / [tɛ ^h o ³¹ p ^h i ⁵⁵]	chili paste
	/tɛ ^h ɔ ³¹ / [tɛ ^h ɔ ³¹]	to build
	/tɛ ^h i ⁵⁵ p ^h u ³¹ / [tɛ ^h i ⁵⁵ p ^h u ³¹]	rice wine
	/tɛ ^h o ³³ / [ts ^h o ³³]	to be wrong

Fricatives

/f/	/fã ⁵⁵ kɔ ³¹ / [fã ⁵⁵ kɔ ³¹] /fã ⁵⁵ tɛ ^h ai ³¹ / [fã ⁵⁵ ts ^h ai ³¹]/ /fɔ ³¹ / [fɔ ³¹]	orange rich to protect
/s/	/si ⁵⁵ / [ɛi ⁵⁵] /su ³¹ / [su ³¹] /si ³¹ / [ɛi ³¹] /ɛ ³¹ sɛ ³¹ / [ɛ ³¹ sɛ ³¹] /sɔ ³¹ / [sɔ ³¹]	to die to know blood breath to study
/x/	/a ³¹ xu ⁵⁵ lu ⁵⁵ / [a ³¹ xu ⁵⁵ lu ⁵⁵] /xu ⁵⁵ / [hu ⁵⁵] /xa ³¹ tɛy ⁵⁵ / [ha ³¹ dzy ⁵⁵] /xe ⁵⁵ / [he ⁵⁵] /xã ³¹ / [hã ³¹]	yellow to pull meat head louse to be ashamed
/ɣ/	/a ³¹ ɣu ³¹ / [a ³¹ ɣu ³¹] /ɣu ⁵⁵ / [ɣu ⁵⁵] /ɣu ⁵⁵ / [ɣu ⁵⁵]	bone good, appropriate to laugh

Nasals

/m/	/mi ⁵⁵ tɛ ^h a ³¹ / [mi ⁵⁵ ts ^h a ³¹] /mu ³¹ / [mu ³¹] /mɛ ⁵⁵ lɔ ⁵⁵ / [mɛ ⁵⁵ l̥ɔ ⁵⁵] /ɛ ³¹ mɔ ³³ mɔ ³³ / [ɛ ³¹ mɔ ³³ mɔ ³³] /mi ³¹ / [mi ³¹]	land, earth good night real, true fire
/n/	/nɔ ⁵⁵ / [nɔ ⁵⁵] /nɔ ³³ mu ³³ / [nɔ ³³ m̥u ³³] /nɛ ³¹ xɔ ³³ lɔ ³³ / [nɛ ³¹ hɔ ³³ lɔ ³³] /no ³¹ / [no ³¹] /ɛ ³¹ nɛ ³¹ / [ɛ ³¹ nɛ ³¹]	to be painful beard sesame to step on deep
/ɲ/	/ɲy ⁵⁵ / [ɲy ⁵⁵] /ɲy ³³ wa ³³ / [ɲy ³³ wa ³³] /ɲi ³¹ / [ɲi ³¹] /ɲi ³³ / [ɲi ³³] /ɲɔ ³³ / [ɲɔ ³³]	to cry younger sister two day tea
/ŋ/	/ŋa ⁵⁵ / [ŋa ⁵⁵] /ŋɔ ³¹ / [ŋɔ ³¹] /ŋɛ ³¹ / [ŋɛ ³¹] /ŋu ⁵⁵ / [ŋu ⁵⁵] /ŋɔ ³³ tɛ ⁵⁵ / [ŋɔ ³³ dɛ ⁵⁵]	salty five banana to be so, to be correct fish
/m̥/	/m̥ ⁵⁵ / [m̥ ⁵⁵] /m̥ ³¹ / [m̥ ³¹] /jɔ ³¹ m̥ ⁵⁵ / [jɔ ³¹ m̥ ⁵⁵]	to say to do mosquito

Laterals

/l/	/a ³¹ lɔ ⁵⁵ / [a ³¹ lɔ ⁵⁵] /la ³³ wa ³³ / [la ³³ wa ³³] /lu ³³ tɛ ³¹ / [lu ³³ tɛ ³¹] /lɯ ³³ / [lɯ ³³] /li ³¹ / [li ³¹]	tongue palm of hand space above to come down four
/l̥/	/l̥ɔ ³¹ / [l̥ɔ ³¹] /l̥a ³³ / [l̥a ³³] /a ³¹ li ⁵⁵ / [a ³¹ l̥li ⁵⁵] /l̥a ³³ / [l̥a ³³]	to steal to fall down excrement (animal) to get cut

Semivowels

/w/	/wɑ ³¹ / [wɑ ³¹] /wa ³¹ / [wa ³¹] /wa ³³ / [wɛ ³³]	pig bamboo to caress
/j/	/je ⁵⁵ ko ⁵⁵ / [je ⁵⁵ go ⁵⁵] /ju ⁵⁵ / [ju ⁵⁵] /ja ³¹ / [ja ³¹] /jo ⁵⁵ / [jo ⁵⁵] /jo ³¹ tɛy ³³ / [jo ³¹ dzy ³³]	upland field to take, to get child one hundred husband

Appendix 2: Sida vowels

Simple Vowels

/i/	/ɲi ³³ / [ɲi ³³] /si ³¹ pi ³³ / [si ³¹ bi ³³] /ɛ ⁵⁵ p ^h i ³¹ / [ɛ ⁵⁵ p ^h i ³¹] /mi ⁵⁵ ɾ ⁵⁵ / [mi ⁵⁵ ɾ ⁵⁵] /ɛ ³¹ tɛ ^h i ⁵⁵ / [ɛ ³¹ tɛ ^h i ⁵⁵]	day pen grandmother far sweet
/e/	/p ^h e ³¹ / [p ^h e ³¹] /pe ³³ / [pe ³³] /mɛ ³¹ / [mɛ ³¹] /t ^h e ³¹ u ⁵⁵ / [t ^h e ³¹ u ⁵⁵] /ɔ ³¹ p ^h ɛ ³¹ / [ɔ ³¹ p ^h ɛ ³¹] /sɛ ³¹ / [sɛ ³¹]	to vomit to divide up to extinguish saliva bamboo rat to kill
/ɛ/	/mɛ ³³ tɛ ^h o ³¹ / [mɛ ³³ tɛ ^h o ³¹] /mɛ ³¹ nɛ ³¹ / [mɛ ³¹ nɛ ³¹] /a ³¹ mje ³¹ lɛ ³¹ / [a ³¹ mje ³¹ lɛ ³¹] /nɛ ⁵⁵ lo ⁵⁵ / [nɛ ⁵⁵ lo ⁵⁵] /a ³¹ wɛ ³³ / [a ³¹ wɛ ³³]	other people tomorrow low earring flower
/ɐ/	/ɛ ³¹ nɛ ³¹ lɛ ³¹ / [ɛ ³¹ nɛ ³¹ lɛ ³¹] /ɛ ³¹ sɛ ³¹ / [ɛ ³¹ sɛ ³¹] /ɛ ³¹ mɛ ³¹ / [ɛ ³¹ mɛ ³¹] /lɛ ³³ pu ³¹ / [lɛ ³³ bu ³¹] /sɛ ³¹ / [sɛ ³¹]	black breath person (of group) hand to steam
/y/	/y ³³ ky ³¹ / [y ³³ gy ³¹] /mi ³¹ k ^h y ³¹ / [mi ³¹ k ^h y ³¹] /i ³¹ sy ³³ sy ³³ / [i ³¹ ɛy ³³ ɛy ³³] /t ^h y ³¹ / [t ^h y ³¹] /jy ³³ / [jy ³³]	pillow smoke to urinate to spit out to slice
/ø/	/o ³³ bø ⁵⁵ / [o ³³ bø ⁵⁵] /p ^h jø ⁵⁵ k ^h u ³¹ / [p ^h jø ⁵⁵ k ^h u ³¹] /nø ⁵⁵ mø ⁵⁵ / [nø ⁵⁵ mø ⁵⁵] /ɛ ³¹ tɛ ^h ø ⁵⁵ / [ɛ ³¹ tɛ ^h ø ⁵⁵] /pø ³³ ta ³¹ / [bø ³³ dæ ³¹] /a ³¹ mɑ ³³ / [a ³¹ mɑ ³³] /o ³¹ k ^h ɑ ³¹ / [o ³¹ k ^h æ ³¹] /a ⁵⁵ sa ³¹ / [a ⁵⁵ sæ ³¹] /kja ³¹ / [gja ³¹] /ju ³³ wa ³³ / [ju ³³ wa ³³]	turban woman's jacket nose root cotton mother head how to listen elephant
/ɔ/	/kɔ ⁵⁵ ɔ ⁵⁵ / [gɔ ⁵⁵ ɔ ⁵⁵] /mi ³³ tɛ ^h ɔ ⁵⁵ / [mi ³³ tɛ ^h ɔ ⁵⁵] /ɲɔ ³³ tɾ ⁵⁵ / [ɲɔ ³³ dɾ ⁵⁵] /ɲɔ ³¹ / [ɲɔ ³¹] /mjɔ ³³ ny ⁵⁵ / [mjɔ ³³ ny ⁵⁵]	winnowing basket sunny fish five macaque

/o/	/to ³¹ / [do ³¹] /ɐ ³¹ lo ⁵⁵ lo ⁵⁵ / [ɛ ³¹ lo ⁵⁵ lo ⁵⁵] /po ³¹ nɛ ³³ / [bo ³¹ nɛ ³³] /pu ³¹ lo ³³ / [bu ³¹ lo ³³] /te ^h o ⁵⁵ ja ³¹ / [ts ^h o ⁵⁵ jæ ³¹]	to beg, to ask for hot buffalo mosquito net person
/u/	/t ^h u ⁵⁵ / [t ^h u ⁵⁵] /k ^h u ³¹ ta ³³ / [k ^h u ³¹ da ³³] /nu ⁵⁵ / [nu ⁵⁵] /kɛ ³¹ tu ³¹ / [kɛ ³¹ du ³¹]	to do ritual treatment spoon you each
/ɤ/	/lɤ ⁵⁵ kɤ ³³ / [lɤ ⁵⁵ gɤ ³³] /xɤ ³³ pɤ ³³ / [hɤ ³³ bɤ ³³] /jɤ ³¹ / [jɤ ³¹] /kɤ ³³ t ^h ɤ ³¹ / [gɤ ³³ t ^h ɤ ³¹] /a ⁵⁵ te ^h ɤ ³¹ / [a ⁵⁵ te ^h ɤ ³¹]	door monkey to grind stairs what
/u/	/u ⁵⁵ / [u ⁵⁵] /ɐ ³¹ te ^h u ⁵⁵ / [ɐ ³¹ ts ^h u ⁵⁵] /ɐ ³¹ ku ⁵⁵ / [ɐ ³¹ gu ⁵⁵] /mu ³¹ / [mu ³¹] /k ^h u ⁵⁵ / [k ^h u ⁵⁵]	to laugh grease dry tuber to arrive