The Fate of the Proto-Lolo-Burmese Rhyme *-a : regularity and exceptions

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I. Introduction

This paper is an attempt to illustrate how detailed study of the evolution of a given protorhyme can shed light on the nature of the regularity of sound change.

The rhyme *-a is by far the best attested final in the Lolo-Burmese (Yi) family, with nearly 150 roots for which it may be reconstructed. In this paper, cognates reflecting this *rhyme are presented from several dozen Lolo-Burmese languages and dialects. The predominant rhyme and tonal reflexes are tabulated for each language, with a view to finding regular patterns of development. Some languages/dialects (e. g. Written Burmese, Lahu, Akha) show great regularity, while others (e. g. Naxi, Jinuo) present problems. Particularly interesting are languages where different tones result in different vocalic reflexes of *-a (e. g. Yi Dafang, Hani Caiyuan [Biyue]). The semivowels-y-and-w-often condition special reflexes, as do other factors, including the grammatical function of the word. Sometimes a root loses its vowel quality because of its position as first element in compounds.

Of key importance are exceptions to general rules of correspondence. Some of these exceptions can be easily explained; in other cases this is more difficult or impossible, and a form may have to be declared "non-cognate". How much variability is to be tolerated in our reconstructions? This paper is intended to be the first step in a project to trace Lolo-Burmese phonological developments in general, especially with respect to rhymes and tones. The results of these studies will be made available on the STEDT website over the next few years. ①

II. Classification of vocalic reflexes

1. Languages/dialects with a clearly predominant reflex

-a	Akha, Bisu, Bola, Burmese, Hani Dazhai, Hani Luqun, Hpun, Lahu, Lalo, Lisu, Nanjian, Phunoi, Sani
-ɔ	Achang, Langsu (Maru), Hani Mojiang, Hani Shuikui (Haoni)
-o	Ahi Mile, Hlaovo (Maru), Zaiwa, Lipho, Mpi, Nanhua, Nasu, Nesu
-u	Luquan, Neisu, Wuding

There is no correlation between the subgroup of Lolo-Burmese that a language belongs to and the particular predominant reflex that it displays. However, as far as the regularity of reflexes is concerned, the most regular languages seem to belong to the Burmish, Central Loloish, and Southern Loloish groups. ②

For an example of a language (Written Burmese) with perfectly regular reflexes of *-a, see Appendix II.

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① My thanks to Dominic Yu for devising the ingenious programs necessary for extracting the relevant forms for this paper from the STEDT database.

② For a generally accepted division of the LB languages, see the list in Appendix I, *Languages and sources used in this study*.

2. Languages with variant reflexes

-a/-ɔ	Hani Caiyuan (Biyue, Pijɔ)
-o/-u	Dafang, Lashi (Leqi)
-a/-ɔ/-o	Kaduo
-a/-ɯ/-o	Beishan, Nosu, Xide
Multiple:	Jinuo, Naxi Lijiang, Naxi Yongning

The data often permit the establishment of conditioning factors for this variation, but sometimes the reasons remain obscure.

(1) Languages with clearly conditioned reflexes

Conditioning factors for variation in vocalic reflexes include:

a. The influence of the semivowels -w- and -y-

See the Lahu data in Appendix III, which show that:

*-a > Lh. -a, *-wa > Lh. -u, *-ya > Lh. -ɛ

b. The influence of the initial consonant

The Achang reflexes illustrate the influence both of the semivowels and that of initial retroflex consonants. These retroflexes arose in Achang in etyma with PLB *sonorants or *sonorant clusters:

Predominant reflex: -ɔ

	PLB	Achang
'put down/keep'	*ʔda^{2}	thɔ^{31}
'rest'	*na^{2}	nɔ^{31}
'salt'	*tsa^{2}	tɕhɔ^{31}
'son/child'	*za^{2}	tsɔ^{31} lo^{31}
'teach'	*ʔma^{2}	m̥ɔ^{35}

After *-w-: -o

	PLB	Achang
'bamboo'	*wa^{2}	o^{31}
'cattle'	*nwa^{2}	no^{31}
'handspan'	*twa^{1}	tho^{55}
'rain'	*rwa^{1}	mau^{31} ʐo^{55}

After modern retroflex initials: -ua

	PLB	Achang
'arrow'	*ʔmra^{2}	kaŋ^{35} m̥ʐua^{31}
'hear'	*gra^{2}	kʐua^{31}
'meat/flesh/animal'	*sya^{2}	ʂua^{31}
'obtain/get'	*ra^{3}	ʐua^{35}
'spirit/soul/shadow'	*ʔla^{3}	pʐua^{35}

Note that -w- evidently takes precedence over retroflexion:

'rain'	*rwa^{1}	mau^{31}ʐo^{55}

In Yi Da fang , *-a regularly becomes -u in words from Tone *2 (see below), but words with initial nasals develop -ɒ or -ɔ in such words:

*mya^{2}	'many'	ɳɒ^{33}
*ʔŋa^{2}	'borrow/lend'	ŋɒ^{33}
*ŋa^{2}	'five'	ŋɒ^{33}
*na^{22}	'rest/pause/stop/stay'	nɒ^{33}
*ŋa^{2}	'fish'	ŋɔ^{33}

c. Grammatical function

Particles and other high-frequency morphemes that play an important role in the grammar are typically unstressed, which may affect both their vowel quality and their tone. The most important functors descending from PLB *-a are *ma 'negative' and *da 'negative imperative'. Achang and Dafang illustrate this point, exceptionally retaining -a in these words:

	PLB	Achang	Dafang
'negative'	*ma$^{1/3}$	ma^{31}	ma^{21}
'negative imperative'	*da^{2}	ta^{31}	t^{h}a^{21}

d. Proto-tone

Our data reveal two striking cases where the vocalic reflex is different according to the proto-tone of the morpheme. In Hani Caiyuan (Biyue, Pijɔ), morphemes with *-a under PLB Tone *1 acquire the Caiyuan vowel -a, while those under Tone *2 acquire Caiyuan -ɔ. (Morphemes under Tone *3 may have either vowel, under conditions which have not been determined.) See Appendix IV.

Similarly, in Yi Dafang , morphemes with *-a under Tone *1 acquire the vowel -o, while those under Tone *2 acquire -u. See Appendix V.

e. Destressing of initial constituents in compounds

The three bodypart etyma for NOSE, EAR, FOREHEAD are virtually homophonous at the PLB level, all descending from PLB *ʔna^{2}. That is why the various modern languages have had to create two- or three-syllable compounds to keep them distinct, e. g. Lahu nā-qhɔ̂ 'nose', nā-pɔ 'ear', and nā-qā-pɨ 'forehead'. Once these compounds have been created, the first syllable is subject to destressing, either to schwa or some other vowel that may not be the same as the regular reflex of *-a in that language. Again, Achang illustrates both phenomena: *-a becomes Achang -i in certain compounds, and unstressed -ă in others:

(a) Where the morpheme occurs as first constituent in compounds:

	PLB	Achang
'ear'	*ʔna^{2}	ni^{31}ŋɔŋ^{55}
'nose'	*ʔna$^{1/2}$	ni^{31}tʂhua^{31}
'sparrow'	*m-dza	tsi^{55}tʂyak^{55}

(b) Where the vowel is reduced as first constituent in compounds:

'fish' ①	*ŋa^{2}	ŋa^{31} ʂua^{31}
'forehead'	*ʔna^{2}	ŋă^{31} tha^{35}
'son/child'	*za^{2}	tsă^{31} oi^{31}

f. Borrowing or dialect mixture

A word borrowed from a related language (either another closely related Yi dialect or Chinese) may well retain the vocalism of the donor language. Achang ʐa^{31} pa^{31} 'dumb/mute' is not a direct descendant of PLB *ʔg-(y)a$^{2/3}$, but is a loan < Chinese yǎba). Similarly, Yi Dafang pu^{21} 'patch' (< PLB *pa^{1}) does not show the expected reflex -o for a word descending from Tone *1 (see (d) above and Appendix V), but seems rather to be a loan from Chinese (Mand. bù).

g. Inconsistent or subphonemic transcription

Different fieldworkers might have their own favorite symbols, or might transcribe subphonemic variation with phonetic symbols that are too precise. Different linguists might transcribe the same phoneme /a/ as "a" or as "-ɑ" or as "-ɐ" or as "-ɒ", according to the particular form in which it appears.

(2) Languages where no clear pattern of conditioning has been found

-a/-ɔ/-o	Kaduo
-a/-ɯ/-o	Beishan, Nosu, Xide②
Multiple:	Jinuo, Naxi Lijiang, Naxi Yongning

Naxi stands somewhat outside the kernel of Lolo-Burmese, with respect both to vocalic and tonal developments. ③ No regular pattern has emerged for conditioning the multiple reflexes of words with PLB *-a. See Appendices VIa and VIb.

Ⅲ. Classification of tonal reflexes

The three tones reconstructed for PLB have very different lexical frequencies. Tone *2 is the most common, appearing in 59 of our etyma. Tone *1 is next, with less than half as many examples (38). Tone *3 is a poor third, occurring with only 18 etyma. Our remaining 20 etyma show tonal variation or irregularity; this group includes several items whose proto-tone cannot yet be determined on the basis of the data.

Tone *3 is marked by creaky phonation in Burmese and several other languages (e.g. Achang, Langsu), and may well have descended from a laryngeal final consonant. Although it must be set up for PLB, it is clearly secondary, a view that is supported by the fact that it participates in many morphological alternations in Burmese and other languages. The most common reflex of this proto-tone is mid-level 33. It is almost never affected by tonal splits, perhaps another indication of its relatively late origin.

The PLB etyma in this study are listed in Appendix VII, grouped by their proto-tone.

Three representative examples of etyma under each of the three proto-tones are also presented in appendices.

For Tone *1: HUNDRED, SICK, TONGUE [Appendix VIII]
For Tone *2: BITTER, SALT, SON/CHILD [Appendix IX]
For Tone *3: OBTAIN/GET, MOON/MONTH, SPIRIT [Appendix X]

① 'Fish' is a special case. It is recorded in the source as ŋa^{31} ʂua^{31}, literally "fish-meat", but the analogy with 'forehead' and 'son' suggests that the vowel is also reduced in this compound, so it should be written as ŋa^{31} ʂua^{31}.

② See Okell 1969; Thurgood 1981.

③ See Matisoff 1991, where the term "Burmo-Naxi-Lolo" was introduced to cover both LB proper and Naxi.

The LB languages with the most consistent tonal reflexes are in the Burmish, Southern Loloish, and Western Yi branches, where tonal splits are relatively rare - i. e. by and large each proto-tone has a single tonal reflex. The Central Loloish languages (e. g. Lahu, Lisu) have undergone tonal splits in Tones *1 and/or *2, but the conditioning is clear in terms of the manner of the syllable-initial *consonants. The Yi (Northern Loloish) languages show the most tonal variation, much of it still unexplained.

1. Examples of languages with no tonal splits

	PLB Tone *1	PLB Tone *2	PLB Tone *3
(*Burmish*)			
Achang	55	31	31ʔ
Burmese	level/clear	falling/breathy	creaky
Hlaovo	HL(= F)	L	H
Hpun	ˊ	ˋ	
Langsu	31	35	55 (constricted)
Lashi (Leqi)	31	55	
Zaiwa	51	21	
(*Southern and Western Loloish*)			
Akha	high/ˊ/	low/ˆ/	mid/ ˉ/
Bisu	ˊ ˊ	ˋ ˋ	ˉ
Caiyuan	55	31	33
Dazhai	55	31	33
Kaduo	ˊ	ˋ	ˉ
Lalo	55/ˊ/	21/ˋ/	33
Nanjian	55	21	33
Phunoi	55/ˊ/	11/ˋ/	
Shuikui	55	31	33

2. Conditioning factors for tonal splits

(1) Manner of articulation of the initial consonant

This is by far the most important factor in tonal splitting in LB languages. A few examples:

	PLB Tone *1	PLB Tone *2	PLB Tone *3
Ahi Mile	33	21 55 (after *glott, ① *fric)	
Bola	55	31 (after *vd initials) 35 (after *vless, *glott)	35 (constricted)
Dafang	21 33 (after *glott, *fric)	33 55 (after *glott)	
Lahu	31 (after *vd) 33 (after *vless, *glott)	53 (after *vd and *vless stops) 11 (after *glott, *vless frics)	33
Lipho	33	21 55 (after *glott)	33
Lisu②	level (after *vd, *vless) high falling (after *glott)	low falling high rising (after *glott)	high falling
Nasu	21 33 (after *glott)	33 55 (after *glott)	
Nosu	33	33 55 (after *glott)	33
Sani	33	21 55 (after *glott)	

① Note that several other languages also have a high level tone in reflexes of Tone *2 etyma with *glottalized initials.

② This Lisu split was first observed in the pioneering work of Burling 1968, who figured out most of the tonal developments in six LB languages spoken in Burma, three of them Burmish (Burmese, Atsi, Zaiwa), and three of them Loloish (Akha, Lahu, Lisu).

(2) Part of speech of the etymon

This rare phenomenon was discovered in Mpi (S. Loloish) in Srinuan 1976.① Each of the proto-tones (in both non-checked and checked syllables) split in two according to whether the etymon was a noun or a verb:

	PLB Tone *1	PLB Tone *2	PLB Tone *3
With nouns	6	2	4
With verbs	5	1	3

	pLoloish HIGH STOPPED	pLoloish LOW STOPPED②
With nouns	$ʔ^4$	$ʔ^2$
With verbs	$ʔ^3$	$ʔ^1$

Phonetically, the verb-tones have an upward curl at the end, probably reflecting a now vanished nominalizing suffix with zero initial.

Ⅳ. Topics for future research

Despite the fact that Lolo-Burmese is arguably the best studied branch of TB to date, many problems still remain:

—The conditioning factors behind the tonal splits in many LB languages and dialects have not yet been figured out in detail,③ and remain for ongoing research to elucidate. This will involve a full-scale study of the reflexes of the PLB *manners of articulation in every language.

—Many questions also remain with respect to vocalic developments, especially in the northern branches of the family ("Yi" in our sense).

—Other fruitful topics to investigate include the question of loanwords into PLB from Tai and Chinese. (One good example of an ancient loan from Tai is 'cloth' PLB *pa^1.)

—Widespread binomial compounds which are found in several languages are also worthy of more detailed study. At least two of these have the vowel -a in both syllables: *sa^0-la^2 'cotton' and *$ša^1$-ma^1 'maize'. While these are clearly loanwords, other binomes are not, e.g 'ashamed' (cf. Lahu yàʔ-tɔ) and 'lord/master' (cf. Lahu jɔ̂-mɔ̂), both of which occur in many different Loloish languages and which consist of native morphemes in both syllables.

Appendix I: Languages and Sources Used in this Study

Ⅰ. Burmish

Achang	TBL #28; ZMYYC #41
Achang Xiandao	TBL #29
Bola	TBL #32
Burmese (Written)	Judson 1893/1953
Hlaovo (Maru)	Sawada 1999
Hpun	Henderson 1978

① Srinuan numbered the Mpi tones from 1 to 6. See also Matisoff 1978, p. 20.

② For the complex conditioning of the Loloish tonal split in stopped syllables (irrelevant to this paper), see Matisoff 1982.

③ These recalcitrant languages include Beishan, Jinuo, Luquan, Mojiang, Nanhua, Naxi, Neisu, Nesu, and Xide.

Langsu (Maru)	TBL #31; ZMYYC #43
Leqi (Lashi)	TBL #33
Zaiwa (Atsi)	TBL #30; ZMYYC #42

Ⅱ. Northern Yi

Beishan	Fu Maoji 1950/1997
Nosu	Chen Kang 1986a,b
Xide	TBL #35; ZMYYC #21

Ⅲ. Southeastern Yi

Axi (Ahi)	ZMYYC #25; Chen Kang 1986a,b
Sani	TBL #39; Chen Kang 1986a,b

Ⅳ. Eastern Yi

Dafang	ZMYYC #22
Luquan	MA Xueliang 1949
Nasu	Chen Kang 1986a,b
Neisu	Chen Kang 1986a,b

Ⅴ. Southern Yi

Mojiang	ZMYYC #26
Nesu	Chen Kang 1986a,b

Ⅵ. Western Yi

Lalo	Bjo. rverud 1998; Chen Kang 1986a,b
Nanjian	ZMYYC #23
Weishan	TBL #36

Ⅶ. Central Yi

Li (Lipho)	Chen Kang 1986a,b
Nanhua	TBL #37; ZMYYC #24
Wuding	TBL #38

Ⅷ. Central Loloish

Lahu	Matisoff 1988
Lisu	TBL #40; ZMYYC #27

Ⅸ. Southern Loloish

Akha	Lewis 1989
Bisu	Baudouin 1991
Hani Caiyuan (Biyue)	ZMYYC #30; Hansson 1989
Hani Dazhai	ZMYYC #31
Hani Luqun	TBL #41
Hani Shuikui (Haoni)	ZMYYC #32; Hansson 1989
Khatu (Kaduo)	Hansson 1989
Mpi	Srinuan 1976; Bradley 1979
Phunoi	Bradley 1979
Sangkong	LI Yongsui 1991

X. Unclassified Loloish

Jinuo	TBL #44; ZMYYC #34

XI. Naxi

Naxi Lijiang	TBL #45; ZMYYC #28
Naxi Yongning (Moso)	ZMYYC #29

*Appendix II. Written Burmese Reflexes of PLB *-a*

PREDOMINANT REFLEX: -a

la	'come'
sa	'easy'
thwa	'handspan'
khwa	'hoof'
ʔəra	'hundred'
ŋa	'I/me'
sa	'only'
ʔəpha	'patch'
rwa	'rain'
lak-ya	'rightside'
hra	'seek/look for'
na	'sick'
ca	'sparrow'
ya	'swidden'
hlya	'tongue'
hmrâ	'arrow'
wâ	'bamboo'
pyâ	'bee'
khrâ, krâ	'between/interval'
klà (Tavoyan)	'between/interval'
khâ	'bitter'
hŋâ	'borrow/lend'
nwâ	'cattle'
pâ	'cheek/face'
krauŋ-bhâ	'weasel' (HPTB:163)
tam-khâ	'door'
nâ	'ear'
câ	'eat/feed'
phyâ	'fever'
ŋâ	'fish'
ŋâ	'five'
phâ	'frog'
swâ	'go'
krâ	'hear'
lâ	'interrogative prt'
myâ	'many'
sâ	'meat/flesh/animal'
lâ	'mule'
ʔə-pâ	'nearby/vicinity'
phɔwâ	'palm/sole'
hrâ	'poor/miserable/difficult'
thâ	'put down/keep'
nâ	'rest/pause/stop/stay'
châ	'salt'
sâ	'son/child'
ʔâ	'strength/win/clf. people'
hmâ	'teach'
pâ	'thin'
kyâ < klâ	'tiger'
swâ	'tooth'
ta	'box'
pa'	'bright/clear/shine'
kya'	'fall'
~ khya'	'let fall, drop'
ʔəbha'	'father'
ʔəma'	'mother'
la'	'moon/month'
ra'	'obtain/get'
hla'	'beautiful'
ʔa'	'dumb/mute'
thâ	'knife'
ma'	'negative'
hna-khôŋ	'nose'
ʔəpa'	'outside part'
ka'	'sing/dance'
ha'	'yawn'
ʔə-lâ	'not castrated'

Reduced vowel:

ləphak	'tea'

*Appendix III. Lahu Reflexes of PLB *-a*

PREDOMINANT REFLEX: -a

hɛ-šā	(*sa^2) 'old'

qha	(* ka^{1}) ' completely '	hā	(* s-ra^{2}) ' poor/miserable/difficult '
~ qhà	(* ka^{1}) ' adverbializer '	tā	(* ʔda^{2}) ' put down/keep '
qha-jɔ̀ʔ	(* ka^{1}) ' basket '	nâ	(* na^{2}) ' rest/pause/stop/stay '
mà	(* ma^{1}) ' classifier '	vâ	(* wa^{2}) ' snow '
pha	(* pa^{1}) ' cloth '	yâ	(* za^{2}) ' son/child '
là	(* la^{1}) ' come '	cā (V), ɔ̀-cā (N)	(* ʔdza^{2}) ' sprout '
ša	(* C-ša^{1}) ' easy '	ɔ̀-ǧâ	(* k-ra^{2}) ' strength/win/clf. people '
dà	(* m-da^{1}) ' fern/bracken '	mā	(* ʔma^{2}) ' teach '
na	(* ʔna^{1}) ' good '	pâ	(* ba^{2}) ' thin '
cha	(* tsa^{1}) ' hot/sunshine '	lâ	(* k-la^{2}) ' tiger '
ha	(* ʔra^{1}) ' hundred '	thâ (Prt)	(* ta^{2}) ' time/when '
ŋà	(* ŋa^{1}) ' I/me '	hā	(* ʔla^{2}) ' trousers '
na	(* ʔna^{1}) ' listen '	və̀ʔ-qā	(* g (w) a^{2}) ' clothes '
ša-ma	(* ša^{1}-ma^{1}) ' maize '	. . . qhɔ̀ʔ. . . bâ RARE	(* m-ba^{2}) ' year '
kà	(* gra^{1}) ' place '	ta-qō	(* da^{3}) ' box '
cà	(* dza^{1}) ' rice '	ba	(* m-ba^{3}) ' bright/clear/shine '
làʔ-ša	(* s-ya^{1}) ' rightside '	pa	(* ba^{3}) ' change/exchange '
ca	(* ʔra^{1}) ' seek/look for '	qa	(* gla^{3}) ' fall, of dew, snow, leaves '
nà	(* na^{1}) ' sick '	ɔ̀-pa	(* ʔba^{3}) ' father '
jà-mə̂	(* m-dza^{1}) ' sparrow '	-ma	(* ʔma^{3}) ' feminine suffix '
á-tà	(* da^{1}) ' stick '	ha-chɨ	(* tsa^{3}) ' frying pan '
là-phàʔ	(* la^{1}) ' tea '	ga	(* m-ga^{3}) ' help '
bà	(* m-ba^{1}) ' throw away '	ha-pa	(* s-la^{3}) ' moon/month '
ha-tɛ̄	(* s-lya^{1}) ' tongue '	ǧa	(* ra^{3}) ' obtain/get '
va-tɛ̂	(* ʔwa^{3}) ' trap '	ɔ̀-ha	(* s-la^{3}) ' spirit/soul/shadow/beautiful '
ha	(* ʔra^{1}) ' winnow '	qha	(* ka^{3}) ' sow/plant '
ha-ma	' winnowing tray '	tá-ve-T	(* da^{0}) ' cicada '
vâ	(* wa^{2}) ' bamboo '	šá-lâ	(* sa^{0}-la^{2}) ' cotton '
(ɔ̀-) kā	(* ʔgla^{2}) ' between '	qā	(* ʔg- (y) a$^{3/2}$) ' dumb/mute '
qhâ	(* ka^{2}) ' bitter '	hâ-tɔ́-pɛ̂ʔ-T	(* hya^{2}) ' goat/antelope '
ŋā	(* ʔŋa^{2}) ' borrow/lend '	cà-qha	(* ka^{1}) ' grain of rice '
ǧâ	(* g-ra^{2}) ' buckwheat '	šā	(* sa$^{1/2}$) ' intention '
pâ	(* ba^{2}) ' face '	mâ	(* ma$^{2/3}$) ' negative '
pā-vî	(* ʔbya^{2}) ' civet cat/weasel '	nā-qhɔ̂	(* s-na$^{1/2}$) ' nose '
ǧâʔ-nā-jɨ	(* ʔna^{2}) ' cockscomb '	ɔ̀-bà-phɔ̂	(* m-ba$^{1/3}$) ' other side/shade '
nā	(* ʔna^{2}) ' ear '	tàʔ-ɬchɛ̂-T	(* da^{0}) ' quiet '
mì-châ	(* tsa^{2}) ' earth '	qa-mɨ̀	(* ga$^{1/2/3}$) ' sing '
cā	(* dz (y) a^{2}) ' eat/feed '	qā-qhêʔ	(* ga$^{1/2/3}$) ' dance '
ɔ̀-jâ	(* m-dza^{2}) ' edge/tip '	gâ (Pv)	(* m-ga^{2}) ' want/long for/think about '
ŋâ	(* ŋa^{2}) ' fish '	há mɨ̀	(* ha^{0}) ' yawn '
ŋâ	(* ŋa^{2}) ' five '		
ú-gâ	(* ra^{2}) ' fontanelle '	After -w- ; -u-	
nā-qā-pɨ	(* ʔna^{2}) ' forehead '	thu	(* twa^{1}) ' handspan '
pā-tɛ́-nɛ̂ʔ	(* ʔba^{2}) ' frog '	-šū	(* swa^{2}) ' tooth '
kâ	(* gra^{2}) ' hear '	nû	(* nwa^{2}) ' cattle '
lâ	(* la^{2}) ' interrogative prt '		

bâ	(*m-ba^{2}) 'joke/tease'	After -y-: -ɛ	
cê-cà	(*dza$^{1/2}$) 'livestock'	hɛ	(*hya^{1}) 'swidden'
và?-pā	(*?ba^{2}) 'male'	bɛ̂	(*bya$^{2/1}$) 'embrace/hug'
mâ	(*mya^{2}) 'many'	pɛ̂	(*bya^{2}) 'bee'
šā	(*sya^{2}) 'meat/flesh/animal'	bɛ̂	(*m-g"ya^{0}) 'chew'
ɔ̀-pâ(-nê)	(*ba^{2}) 'nearby/vicinity'	< PLB *Ngwya^{2}	(-y- takes precedence over -w-)
tâ	(*da^{2}) 'neg. imperative'		

Appendix IV. Hani Caiyuan (Biyue): tonally determined vocalic reflexes

(*a*) *Morphemes with* *-*a under PLB Tone* *1 *or* *3 > *Caiyuan -a*:

PLB		Caiyuan
*ka^{1}	'adverbializer'	kha^{55}
*pa^{1}	'cloth'	pha^{55}
*la^{1}	'come'	la^{55}
*?ra^{1}	'hundred'	ja^{55}
*ŋa^{1}	'I/me'	ŋa^{55}
*?na^{1}	'listen/ask'	na^{55} te^{31}
*ša^{1}-ma^{1}	'maize'	sa^{55} tv^{33}
*s-na$^{1/2}$	'nose' ①	na^{55} me^{55}
*na^{1}	'sick'	na^{55}
*m-dza^{1}	'sparrow'	tsa^{55} tsu^{55}
*hya^{1}	'swidden'	ja^{55} khu^{55}
*?lya^{1}	'tongue'	a^{31} la^{55}
*?ra^{1}	'winnow'	ja^{55}
*ba^{3}	'change/exchange'	pha^{55}
*?ba^{3}	'father'	a^{31} pa^{31}
*?la^{3}	'spirit/soul'	a^{31} la^{55}

(*b*) *Morphemes with* *-*a under PLB Tone* *2 *or* *3 > *Caiyuan* -ɔ:

PLB		Caiyuan
*ka^{2}	'bitter'	khɔ^{31}
*g-ra^{2}	'buckwheat'	kɔ^{31}
*?na^{2}	'ear'	nɔ^{31} pu^{55}
*tsa^{2}	'earth'	me^{55} tshɔ^{31}
*ts(y)a^{2}	'feed' (v.)	pi^{33} tsɔ^{31}
*dz(y)a^{22}	'eat'	tsɔ^{31}
*ŋa^{2}	'fish'	ŋɔ^{31} sɔ^{31}
*ŋa^{2}	'five'	ŋɔ^{31}
*?na^{2}	'forehead'	nɔ̲^{31} khɔ̲^{31}
*?ba^{2}	'frog'	phɔ^{31} nɛ̲^{33}
*mya^{2}	'many'	mɔ^{31}
*sya^{2}	'meat/flesh/animal'	sɔ^{31}
*da^{22}	'neg. imperative'	thɔ^{31}
*s-ra^{22}	'poor/difficult'	sɔ^{31}

① This etymon shows tonal variation between *1 and *2. This Caiyuan form evidently descends from the Tone *1 variant.

*na^{22}	'rest/pause/stop/stay'	kɔ^{31} nɔ^{31}
*tsa^{2}	'salt'	tshɔ^{31} me^{31}
*za^{2}	'son/child' ①	jɔ^{31} ni^{55} ~ ja^{31} jv^{33}
*wa^{22}	'frost'	ɔ^{31}
*za^{22}	'son/child'	jɔ^{31} ni^{55}
*k-ra^{22}	'strength/win'	kɔ^{31}
*k-la^{22}	'tiger'	lɔ^{31} mɔ^{33}
*s-la^{3}	'moon/month'	pɔ^{33} lɔ^{33}
*ra^{3}	'obtain/get'	jɔ^{33}
*ka^{3}	'sow/plant'	khɔ^{33}

Appendix V. Yi Dafang: tonally determined vocalic reflexes

(*a*) *Morphemes with *-a under Tone *1 > Dafang -o*

PLB		Dafang
*ka^{1}	'adverbializer'	kho^{21}
*ma^{1}	'classifier'	mo^{33}
*ʔna^{1}	'easy'	ŋo^{33}
*kwa^{1}	'hoof'	kho^{21}
*tsa^{1}	'hot/sunshine'	tsho^{21}
*ʔra^{1}	'hundred'	ho^{21}
*ŋa^{1}	'I/me'	ŋo^{21}
*rwa^{1}	'rain'	m̩(u) ho^{33}
*dza^{1}	'rice'	dzo^{21} ʈhu^{33}
*ʔra^{1}	'seek/look for'	so^{33}
*na^{1}	'sick'	no^{21}
*ʔlya^{1}	'tongue'	ɬo^{33}

(*b*) *Morphemes with *-a under Tone *2 > Dafang -u*

*ka^{2}	'bitter'	khu^{33}
*s-ra^{2}	'poor/miserable/difficult'	su^{33}
*ʔda^{2}	'put down/keep'	tu^{33}
*tsa^{2}	'salt'	tshu^{33} ba^{21}
*wa^{2}	'snow'	vu^{33}
*za^{2}	'son/child'	zu^{33}
*k-ra^{2}	'strength/win/clf. people'	vu^{33}
*ʔma^{2}	'teach' ②	m̩(u)^{55}
*k-la^{2}	'tiger'	lu^{55}
*ta^{2}	'time/when'	thu^{55}
*ʔla^{2}	'trousers'	ɬu^{55}
*dz(y)a^{2}	'eat'	dzu^{33}
*ʔba^{2}	'frog'	pu^{55} tsa^{21}
*gra^{2}	'hear'	dʑu^{33}

① Note the different reflexes, suggesting a tonal variation between *1 and *2 in pre-Achang. (This etymon otherwise regularly belongs to Tone *2 in LB.)

② In this word the vowel tends to be swallowed up entirely, leaving a syllabic nasal. Precisely the same phenomenon occurs in Lahu, where the phonemic syllable /mu/ is frequently realized as a syllabic labiodental nasal.

*sya^{2}	'meat/flesh/animal'	fu^{33}
*m-g^{w}ya^{2}	'chew'	ŋgu^{33}

(c) *Morphemes with* *ə *under Tone* *3 > *Dafang* -o, -u, ə , *or* -ɔ:

*ra^{3}	'obtain/get'	ɣu^{21}
*m-ba^{3}	'bright/clear/shine'	bo^{21}
*ʔla^{3}	'moon/month'	ho^{21} bo^{21}
*ʔba^{3}	'father'	ə^{33} ba^{33}
*hya^{3}	'elephant'	xɔ^{21}

There is something about Tone *3, undoubtedly its diachronically secondary nature (see Section Ⅲ above) that favors inconsistent reflexes!

Appendix VIa. Multiple reflexes of *-ə *in Naxi Lijiang*

NO PREDOMINANT REFLEX!!

Reflex -ɑ:

khɑ^{33}	'bitter'
nɑ^{31} ɣɯ^{33}	'cattle'
pʰɑ^{33} me^{33}	'face'
pɑ^{33} tɕə^{33}	'frog'
mə^{33} tʰɑ^{31}	'neg. imperative'
kɑ^{33}	'strength/win/clf. people'
lɑ^{33}	'tiger'
tɑ^{55}	'box'
xɑ^{55} xɑ^{33} i^{33}	'yawn'
ə^{31} bɑ^{33}	'father'
ndɑ^{33} ndɑ^{33}	'edge/tip'
ə^{55} gə^{31} ; ə^{55} khɑ^{33}	'buckwheat'

Reflex -uɑ/after -ŋ- *and* -w-/:

uɑ^{33}	'five'
khuɑ^{33} be^{31}	'hoof'

Reflex -i /after palatals/:

tɕi^{31}	'handspan'
ɕi^{33}	'hundred'
ɕi^{31}	'rice'
ɕi^{55}	'tongue'
ɲi^{33}	'borrow/lend'
ɲi^{33}	'fish'
ɲi^{55} məɹ^{31}	'nose'
ɲi^{33}	'want/long for/think about'
si^{33}	'poor/miserable/difficult'

Reflex -ɯ:

xɯ^{31}	'rain'
mɯ^{55}	'bamboo'
ndzɯ^{33}	'eat/feed'
vu^{31} ʐɯ^{33}	'feed(v.)'

Reflex -v:

fv^{55}	'patch'

Reflex -o:

kho^{33} mi^{33}	'hear'
zo^{33}	'son/child'
ə^{33} ko^{33}	'elder brother'

Reflex -e:

le^{55}	'tea'
me^{55}	'teach'
le^{33}	'trousers'
me^{33}	'classifier'
tshe^{33}	'salt'
xe^{33} me^{33}	'moon/month'
ʐəɹ^{33} the^{33}	'knife'

Reflex -æ:

bæ^{33}	'bee'
tshŋ^{33} sæ^{21}	'livestock/dom. animal'
xæ^{21}	'wear/clothe/dress'

Reflex -ə:

ŋə^{31}	'I/me'
piə^{55}	'change/exchange'
mə^{33}	'negative'
dʐi^{31} tshəɹ^{33}	'hot'
ə^{55} gə^{31} ; ə^{55} khɑ^{33}	'buckwheat'
/which one? /	

Reflex -ə :

ndzə^{33} zo^{33}	'sparrow'

bɯ^{31}	'many'
ʂ ɯ^{33}	'meat/flesh/animal'
tʂ ɯ^{33}	'earth'
xɯ^{33}	'tooth'
ŋgɯ^{33}	'chew'

Reflex -u:

khu^{33}	'door'
ʂ u^{31}	'seek/look for'
mbu^{33}	'bright/clear/shine'

Reflex -y:

ʑi^{31} tɕy^{31}	'rightside'
/2nd syll. ? /	
ndy^{31}	'stick'
zy^{55}zy^{13}	'son/child'
/cf. zo^{33}/	

*Appendix VIb. Multiple reflexes of *-a in Naxi Yongning (Moso)*

NO PREDOMINANT REFLEX!!

Reflex -i:

mi^{33}	'classifier'
xi^{55}	'tooth'
ŋi^{55} ; nv^{55}	'listen'
a^{31}ɬi^{55}	'spirit/soul/shadow/beautiful'
dʅ^{33}ɕi^{55}	'hundred'
xi^{31}	'rain'
ɕi^{31} ; ɕi^{33}tʂhuɑ^{33}	'rice'
ɕi^{31}mi^{13}	'tongue'
mi^{31}ɬe^{31}	'bamboo'
ŋi^{33}	'want/long for/think about'
ŋi^{33}gə^{33}	'nose'
ŋi^{33}zo^{33}	'fish'
ʮ^{31}ʑi^{13}	'cattle'
/cognate to Lahu cê-cà? /	

Reflex -e:

ʂ e^{31}	'seek/look for'
khe^{33}	'door'
tʂ e^{33}	'earth'
ʐe^{33}	'arrow'
ʂ e^{33}	'meat/flesh/animal'
tshe^{33}	'salt'
ɬe^{33}khuɑ^{13}	'trousers'
ɬe^{33}mi^{33}	'moon/month'
sʅ^{33}thie^{33}	'knife'

Reflex -ɑ:

ŋɑ^{33}	'I/me'
ʐu^{31}dzɑ^{13}	'rightside'
dzɑ^{33}	'poor/miserable/difficult'
khɑ^{33}	'bitter'
dʐɑ^{13}	'strength/win/clf. people'
kɑ^{33}	'tiger'
kɑ^{13}	'help'
ʐɑ^{33}khɑ^{33} ; ʐə^{33}gə^{31}	'buckwheat'

Reflex -uɑ or -ua or -uə:

khuɑ^{33}bi^{31}	'hoof'
xuɑ^{13}	'patch'
ŋua^{33}	'five'
dʐua^{33}mi^{33}	'sparrow'
guə^{13}	'sing/dance'

Reflex -u:

bu^{33}	'bright/clear/shine'

Reflex -v:

ə^{33}v^{55}	'father'
v^{33}v^{33}	'chew'

Reflex -o:

zo^{13}nv^{55}	'son/child'
zo^{33}	'son/child' te^{33} 'handspan'
zo^{33}ba^{31}	'dumb/mute'
/ < Chinese? /	

Reflex -ʅ:

tshʅ^{13}	'hot'
dzʅ^{55} ; dzʅ^{13}	'eat/feed'

Reflex -ə:

ʐə^{33}gə^{31} ; ʐɑ^{33}khɑ^{33}	'buckwheat'
pə^{31}mi^{13}	'frog'
piə^{33}	'change/exchange'
mə^{33} ; mɑ^{33}	'negative'

Cognacy doubtful:

pha^{33}khuɑ^{31}	'face'

mɑ[33]; mə[33] 'negative'

*Appendix VII. PLB etyma with the *-a rhyme, grouped by proto-tone*

Etyma reflecting PLB Tone *1 (38)

*ka[1]	'adverbializer/completely'
*ša[1]	'ask for'
*ma[1]	'bamboo' [1]
*ka[1]	'basket (for carrying, storage)'
*bya[1]	'blue'
*ma[1]	'classifier (general)'
*pa[1]	'cloth'
*la[1]	'come'
*ga[1]	'cover/shield'
*ša[1]	'easy/pleasant; level (of road)'
*m-da[1]	'fern/bracken'
*ʔna[1]	'good/permissible'
*ka[1]	'grain of rice'
*twa[1]	'handspan'
*kwa[1]	'hoof'
*tsa[1]	'hot/sunshine'
*ʔra[1]	'hundred'
*ŋa[1]	'I/me'
*ʔna[1]	'listen/ask'
*ša[1]-ma[1]	'maize'
*sa[1]	'only'
*pa[1]	'patch'
*gra[1]	'place' [1]
*rwa[1]	'rain'
*dza[1]	'rice (in the field)'
*s-ya[1]	'rightside'
*ga[1]	'road'
*ʔra[1]	'seek/look for'
*na[1]	'sick'
*m-dza[1]	'sparrow'
*da[1]	'stick'
*hya[1]	'swidden'
*la[1]	'tea'
*m-ba[1]	'throw away'
*ʔlya[1]	'tongue'
*r-wa[1]	'village'
*ʔra[1]	'winnow'
*ma[1]	'wound/injury'

Etyma reflecting PLB Tone *2 (59)

*ʔmra[22]	'arrow'
*wa[22]	'bamboo' [2]
*bya[22]	'bee'
*ʔgla[22]	'between/interval'
*ka[22]	'bitter'
*ʔŋa[22]	'borrow/lend'
*g-ra[22]	'buckwheat'
*nwa[22]	'cattle'
*ba[22]	'cheek/face'
*m-gʷya[22]	'chew'
*ʔbya[22]	'civet cat/weasel'
*ʔna[22]	'cockscomb'
*ka[22]	'door'
*ʔna[22]	'ear'
*tsa[22]	'earth/ground'
*dz(y)a[22]	'eat'
*ts(y)a[22]	'eat, give to/feed'
*m-dza[22]	'edge/tip'
*pya[22]	'fever'
*ŋa[22]	'fish'
*ŋa[22]	'five'
*ra[22]	'fontanelle'
*m-ba[22]	'joke/tease'
*ba[22]	'liquor'
*ʔba[22]	'male (animal)'
*la[22]	'male/uncastrated'
*mya[22]/mra[22]	'many'
*sya[22]	'meat/flesh/animal'
*la[22]	'mule'
*ba[22]	'nearby/vicinity'
*da[22]	'negative imperative'
*sa[22]	'old (of things)'
*pʷa[22]	'palm/sole'
*s-ra[22]	'poor/miserable/difficult'
*ʔda[22]	'put down/keep'
*na[22]	'rest/pause/stop/stay'
*tsa[22]	'salt'
*wa[22]	'snow/frost'
*za[22]	'son/child'
*ʔdza[22]	'sprout'
*k-ra[22]	'strength/win/clf. people'
*ʔma[22]	'teach'
*ba[22]	'thin'
*k-la[22]	'tiger'

*ʔna^{22}	'forehead'	*ta^{22}	'time/when'
*ʔba^{22}	'frog'	*swa^{22}	'tooth'
*s-wa^{22}	'go'	*ʔla^{22}	'trousers'
*hya^{22}	'goat/antelope'	*m-ga^{22}	'want/long for/think about'
*da^{22}	'guest'	*g(w)a^{22}	'wear/clothes/dress'
*gra^{22}	'hear'	*dya^{22}	'wind' (n.)
*la^{22}	'interrogative particle'	*m-ba^{22}	'year (poetic)'
*k-ya^{22}	'itch'		

Etyma reflecting PLB Tone *3 (18)

*da^{3}	'box'	*tsa^{3}/(d)za^{3}	'frying pan'
*m-ba^{3}	'bright/clear/shine'	*m-ga^{3}	'help'
*ba^{3}	'change/exchange'	*ʔla^{3}	'moon/month'
*m-k(y)a^{3}	'crab'	*ra^{3}	'obtain/get'
*hya^{3}	'elephant'	*ma^{3}	'plough' [1]
*gla^{3}	'fall (of dew, frost, snow, hail, leaves)'	*wa^{3}	'satiated'
*kla^{3}	'fall, cause to; drop'	*ka^{3}	'sow/plant'
*ʔba^{3}	'father'	*ʔla^{3}	'spirit/soul/shadow/beautiful'
*ʔma^{3}	'feminine suffix/mother'	*ʔwa^{3}	'trap'

Etyma with variant, irregular, or undetermined tones (20)

*wa^{0}	'axe'	*ta^{0}	'knife'
*pa^{0}	'breast/nipple/milk'	*dza$^{1/2}$	'livestock/domestic animal'
*ga^{0}	'brother, elder'	*ma$^{2/3}$	'negative'
*da^{0}	'catch'	*ʔna$^{1/2}$	'nose'
*da^{0}	'cicada'	*m-ba$^{1/3}$	'other side/shade'
*sa^{0}-la^{22}	'cotton'	*ra^{0}	'place' [2]
*ka^{0}	'crow'	*ŋa^{0}	'plough' [2]
*ʔg-(y)a$^{2/32}$	'dumb/mute'	*da^{0}	'quiet'
*bya$^{1/22}$	'embrace/hug'	*ga$^{1/2/3}$	'sing/dance'
*sa$^{1/22}$	'intention' (verb particle)	*ha^{0}	'yawn'

Appendix VIII. Exemplary Sets under PLB Tone *1

HUNDRED *ʔra^{1}

5. Langsu (Maru)	jɔ^{31}	26. Lipho	xo^{33}
9. Zaiwa (Atsi)	ʃo^{51}	28. Lisu	hɛ^{33}
10. Ahi	xo^{2}	29. Mojiang	(thi^{21})ho^{21}
11. Ahi Mile	thi^{21}xo^{33}	32. Nanhua	thi^{21}xo^{33}
12. Akha	já	33. Nanjian	hɑ^{55}
14. Burmese (Written)	ʔəra	34. Nasu	ho^{21}
15. Dafang	ho^{21}	36. Naxi Lijiang	ɕi^{33}
16. Hani Caiyuan (Biyue)	ja^{55}	37. Naxi Yongning (Moso)	dʐ^{33}ɕi^{55}
17. Hani Dazhai	ja^{55}	38. Neisu	ho^{21}
20. Hani Shuikui (Haoni)	xɔ^{55}	39. Nesu	xo^{21}
22. Jinuo	ɕɔ^{33}	40. Nosu	ha^{33}
23. Lahu	ha	44. Sani [Nyi]	ha^{33}
24. Lalo (SB)	há	48. Xide ha^{33}	
25. Lalo	ha^{55}	49. Luquan	ʔhû^{11}

SICK *na[1]

2. Achang	nɔ^{35} 'ill/sick'
5. Langsu (Maru)	nɔ^{31}
9. Zaiwa (Atsi)	no^{51}
10. Ahi	no^{22} 'sick'
11. Ahi Mile	no^{33}
12. Akha	ná
13. Bisu	ʔaŋ-dá
14. Burmese (Written)	na
15. Dafang	no^{21}
16. Hani Caiyuan (Biyue)	na^{55}
17. Hani Dazhai	na^{55}
20. Hani Shuikui (Haoni)	nɔ^{55}
22. Jinuo	nɔ^{42}
23. Lahu	nà
24. Lalo (SB)	ná
25. Lalo	nɑ^{55} 'sick/be ill/hurt'
26. Lipho	no^{33} 'be sick'
28. Lisu	nɑ^{33}
29. Mojiang	no^{21}
30. Mpi	no^{5} 'pain, be in/sick'
32. Nanhua	no^{33}
33. Nanjian	nɑ^{55}
34. Nasu	no^{21} 'sick/be ill/hurt'
39. Nesu	no^{21} 'sick/be ill/hurt'
40. Nosu	na^{33} 'be sick'
41. Phunoi	dɑ^{55} ce^{33} 'sick'
44. Sani [Nyi]	nɑ^{33} 'be sick'
48. Xide	na^{33}
49. Luquan	nu^{11} ~ nu^{33}

TONGUE *ʔlya

2. Achang	ɕɔ^{55} 'tongue'
5. Langsu (Maru)	ʃɔ^{31}
9. Zaiwa (Atsi)	ʃo^{51}
10. Ahi	lo^{33} ɬo^{55}
11. Ahi Mile	lo^{33}
12. Akha	mɛ̀-lá
13. Bisu	man·hlà ʔɑ̃^{33} hlɑ^{55}
14. Burmese (Written)	hlya
15. Dafang	ɬo^{33} ɬɑ^{33}
16. Hani Caiyuan (Biyue)	a^{31}la^{55}
17. Hani Dazhai	la^{55}ma^{33}
20. Hani Shuikui (Haoni)	ɔ^{31}l̥ɔ^{55}
22. Jinuo	mɸ^{33}khɹa^{33}
23. Lahu	ha-tɛ̄
24. Lalo (SB)	ʔlá
25. Lalo	ʔla^{55} ʔlɑ^{55}
26. Lipho	lo^{33}
28. Lisu	lɑ^{44}tʃhɯ^{44}
29. Mojiang	so^{55}phɛ^{21}
30. Mpi	ʔɑ^{2}lo^{6}
32. Nanhua	lo^{33}
33. Nanjian	lɑ^{55}
34. Nasu	ɬo^{33}
36. Naxi Lijiang	ɕi^{55}
37. Naxi Yongning (Moso)	ɕi^{31}mi^{13}
38. Neisu	ɬu^{13}
39. Nesu	lo^{55}pʰɪ^{21}
40. Nosu	ha^{33}ne^{33}
41. Phunoi	ʔāhlá
44. Sani [Nyi]	ɬa^{33}
48. Xide	ha^{33}ne^{33}

Appendix IX. Exemplary Sets under PLB Tone *2

BITTER *ka[2]

2. Achang	xɔ31 'bitter'
5. Langsu (Maru)	khɔ^{35}
9. Zaiwa (Atsi)	kho^{21}
11. Ahi Mile	khʌ^{21}
12. Akha	xhà
13. Bisu	ʔaŋ-khà
14. Burmese (Written)	khâ
15. Dafang	khu^{33}
16. Hani Caiyuan (Biyue)	khɔ^{31}
17. Hani Dazhai	xa^{31}
20. Hani Shuikui (Haoni)	xɔ^{31}
22. Jinuo	a^{33}khɔ^{55}
23. Lahu	qhâ
24. Lalo (SB)	khà
28. Lisu	khuɑ^{31}
29. Mojiang	khɒ^{33}
32. Nanhua	khʌ^{33}
33. Nanjian	khɑ^{21}
36. Naxi Lijiang	khɑ^{33}
37. Naxi Yongning (Moso)	khɑ^{33}
48. Xide	khɯ^{33}
49. Luquan	gu^{33} 'bitter, hard'

SALT *tsa²

2. Achang	tɕhɔ³¹ 'salt'
5. Langsu (Maru)	tshɔ³⁵
9. Zaiwa (Atsi)	tsho⁵⁵
10. Ahi	tsho²¹
11. Ahi Mile	tsho²¹ mu̱³³
12. Akha	phàŋɣòtshà
13. Bisu	tshɔ̀-mɛ̀
14. Burmese (Written)	châ
15. Dafang	tshu³³ba²¹
16. Hani Caiyuan (Biyue)	tshɔ³¹ mẹ³¹
17. Hani Dazhai	tsha³¹ dɣ³¹
20. Hani Shuikui (Haoni)	tsha³¹ tɣ³¹
22. Jinuo	tsha⁵⁵ kha³¹
24. Lalo (SB)	tshà-bùq
25. Lalo	tsha²¹
26. Lipho	tsho²¹
28. Lisu	tshɑ⁴¹ bo⁴⁴
29. Mojiang	tsho³³
30. Mpi	sɑ²tɑʔ²
32. Nanhua	tsho²¹
33. Nanjian	tshɑ²¹ bo³³
34. Nasu	tsho³³
36. Naxi Lijiang	tshe³³
37. Naxi Yongning (Moso)	tshe³³
38. Neisu	tshu³³
39. Nesu	tsho³³
40. Nosu	tshɯ³³
44. Sani [Nyi]	tsha²¹
48. Xide	tshɯ³³
49. Luquan	ts'u³³

SON/CHILD *za²

2. Achang	tsɑ̃³¹ oi³¹ 'child'
2. Achang	tsɔ³¹ lo³¹ 'son'
5. Langsu (Maru)	tsɔ³⁵
9. Zaiwa (Atsi)	juʔ²¹ ke⁵¹ tso²¹
9. Zaiwa (Atsi)	tsõ²¹ ʃaŋ⁵¹
10. Ahi	zo²¹
11. Ahi Mile	A³³ bA̱⁵⁵ zo²¹
11. Ahi Mile	zo²¹
13. Bisu	jà
14. Burmese (Written)	sâ
15. Dafang	zu³³
16. Hani Caiyuan (Biyue)	ja̱³¹ jɣ̱³³
16. Hani Caiyuan (Biyue)	jɔ³¹ ni⁵⁵
17. Hani Dazhai	za³¹ ; za³¹ jo³³
17. Hani Dazhai	za³¹ gu³¹
20. Hani Shuikui (Haoni)	zɔ³¹
20. Hani Shuikui (Haoni)	zɔ³¹ nu⁵⁵
22. Jinuo	zɔ³³ ku³³/⁴⁴
23. Lahu	yâ
24. Lalo (SB)	zà
25. Lalo	za²¹
26. Lipho	zo²¹
28. Lisu	zɑ³¹
28. Lisu	zɑ³¹ ne⁴⁴
29. Mojiang	A⁵⁵ tu̱³³ zo³³
29. Mojiang	zo³³
32. Nanhua	A³³ ɳi³³ zo²¹
32. Nanhua	zo²¹
33. Nanjian	ɑ⁵⁵ ni⁵⁵ zɑ²¹
33. Nanjian	zɑ²¹
34. Nasu	zo³³
36. Naxi Lijiang	zo³³
36. Naxi Lijiang	zɣ⁵⁵ zɣ¹³
37. Naxi Yongning (Moso)	zo¹³ nv⁵⁵
37. Naxi Yongning (Moso)	zo³³
38. Neisu	zu³³
39. Nesu	zo³³
40. Nosu	zɯ³³
44. Sani [Nyi]	za²¹
48. Xide	a⁴⁴ ʐi⁴⁴
48. Xide	zɯ³³
49. Luquan	zu³³

Appendix X. Exemplary Sets under PLB Tone *3

OBTAIN/GET *ra³

2. Achang	ʐua³⁵ 'get'
10. Ahi	ɣo̱³³ 'obtain'
11. Ahi Mile	ɣo³³
12. Akha	za ~ ja
14. Burmese (Written)	ra'
15. Dafang	ɣu²¹
16. Hani Caiyuan (Biyue)	jɔ³³
17. Hani Dazhai	ɣa³³
20. Hani Shuikui (Haoni)	jɔ³³
22. Jinuo	jɔ³³
23. Lahu	ga
24. Lalo (SB)	ɣa
25. Lalo	ɣo̱³³ 'obtain'
26. Lipho	ɣo̱³³ 'obtain'
28. Lisu	wɑ⁴⁴
29. Mojiang	ɣo̱²¹
32. Nanhua	ɣo³³

33. Nanjian ɣɑ^{33}
34. Nasu ɣo̱^{2} 'obtain'
38. Neisu ɣo̱^{33} 'obtain'
39. Nesu ɣo̱^{33} 'obtain'
40. Nosu ɣɯ̱^{4} 'obtain'
44. Sani [Nyi] ɣa^{44} 'obtain'
48. Xide ɣɯ^{33}
49. Luquan ju ~ ɣu 'obtain, reach'

MOON/MONTH *ʔla^{3}

2. Achang phă^{31} lɔʔ^{31} 'moon'
2. Achang pau^{51} lɔ^{35} 'month'
5. Langsu (Maru) lo̱^{55}
9. Zaiwa (Atsi) lŏ^{55} mo^{55}
11. Ahi Mile ɬo^{33}
11. Ahi Mile ɬo^{33} bo^{33}
12. Akha ba-la
13. Bisu hla 'month'
ʔùhla 'moon'
14. Burmese (Written) la'
15. Dafang ho^{21} bo^{21}
16. Hani Caiyuan (Biyue) lɔ^{33} altar, seat, place'
16. Hani Caiyuan (Biyue) pɔ^{33} lɔ^{33}
17. Hani Dazhai ba^{33} la^{33}
20. Hani Shuikui (Haoni) pɔ^{33} l̩ɔ^{33}
22. Jinuo ɬɔ^{33}
22. Jinuo pu^{33} ɬa^{44}
23. Lahu ha-pa
24. Lalo (SB) xa-ba
28. Lisu hɑ^{33}
28. Lisu hɑ^{33} bɑ^{33}
29. Mojiang xo^{21} bo^{21}
30. Mpi lɣ^{4} 'cl. for months'
pi^{2} lo^{4} 'month'
32. Nanhua ɕo^{33} bo^{33}
33. Nanjian xɑ^{33} bɑ^{33}
36. Naxi Lijiang xe^{33} me^{33}
37. Naxi Yongning (Moso) ɬe^{33} mi^{33}
48. Xide ɬo^{21} bo^{21}
48. Xide m̩(u)^{33} ɬɯ^{33}
49. Luquan m̩u

SPIRIT/SOUL/SHADOW/BEAUTIFUL *s-la^{3}

2. Achang pz̩ua^{35} 'soul/spirit'
5. Langsu (Maru) sə̆^{31} pjɔ^{31}
9. Zaiwa (Atsi) să^{21} pjo^{51}
11. Ahi Mile i^{33} ɬo^{33} zo^{21}
12. Akha sàq-lá
14. Burmese (Written) hla' 'beautiful'
16. Hani Caiyuan (Biyue) a^{31} la^{55}
17. Hani Dazhai su^{55} la^{55}
20. Hani Shuikui (Haoni) ɔ^{55} l̩ɔ^{55}
23. Lahu ɔ̀-ha
24. Lalo (SB) há-zà
28. Lisu hɑ^{33}
29. Mojiang xo^{21} mo^{21}
32. Nanhua ɕo^{33}
33. Nanjian xɑ^{55}
37. Naxi Yongning (Moso) a^{31} ɬi^{55}
48. Xide ʐɿ̄^{33} ɬa^{33}
49. Luquan ɬɣ^{33} 'evil ghost'
ju^{11} 'spirit, person,

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中译文

原始彝缅语韵母 *-a 的演化：规律性与例外[①]

J. A. 马提索夫 著 李子鹤 译

一 引言

本文试图说明，如何通过某个特定的原始语韵母的演化的详细研究，来揭示语音演变的规律性。

*-a 是彝缅原始语中得到最好证实的韵母，有近 150 个构拟出来的词根包含这个韵母。本文列出了几十种彝缅族语言和方言中包含 *-a 韵母的后代形式的同源词。不同语言中占优势的元音对应形式和声调都分别列了表，目的是找出语音发展的规律模式。一些语言/方言（例如缅文、拉祜语、阿卡语）表现出很强的规律性，而另外一些（例如纳西语、基诺语）则存在问题。最引人注目的是，一些语言韵母中的几个 *-a 韵母的不同后代形式是由不同的声调导致的（例如 Dafang 彝语，Caiyuan 哈尼语[Biyue]）。特殊元音对应形式的出现往往是半元音-y-和-w-的影响，还有其他一些因素，包括词的语法功能。有时候词根作为复合词的第一个语素时，会发生元音弱化。

至关重要的是那些不符合总体对应规律的例外。有一些例外很容易得到解释；而另一些情况就很难甚至无法进行解释，这样的形式也许只能认为不是同源词。我们的构拟应该容纳多大程度的后代变异呢？现在将要开展一项全面追溯彝缅语音系发展的工程，特别是关注它的韵母和声调，而本文就是其中的第一步。这些研究的成果，未来几年内将在 STEDT 网页上公布出来。[②]

二 元音对应形式的分类

2.1 存在占绝对优势的元音对应形式的语言/方言

-a	阿卡语、Bisu 语、波拉语、缅语、Dazhai 哈尼语、Luqun 哈尼语、Hpon 语、拉祜语、Lalo 语、傈僳语、Nanjian 语、Phunoi 语、撒尼语
-ɔ	阿昌语、浪速（Maru）语、墨江哈尼语、Shuikui（Haoni）哈尼语
-o	Ahi Mile 语、Hlaovo（Maru）语、载瓦语、Lipho 语、Mpi 语、南华彝语、Nasu 语、Nesu 语
-u	Luquan 语，Neisu 语、武定彝语

一种语言中什么样的元音对应形式表现出优势，与它属于彝缅语的哪一分支没有对应关系。但从后代形式的规律性着眼，规律性最强的语言都属于缅语支、中傈僳语支和南傈僳语支。[③]

具有完美的规律性的语言的例子是缅文，见附录 II。[④]

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① 本文为上一篇 The Fate of the Proto-Lolo-Burmese Rhyme *-a :*regularity and exceptions* 的中译文。

② 感谢 Dominic Yu 专门设计了程序，从而能够从 STEDT 数据库中提取出本文相关的表格。

③ 现在公认的彝缅语言谱系分类请参见附录 I：本研究引用的语言和文献。

④ 附录见上篇英文本附录，本文不再另译。

2.2 存在多个元音对应形式的语言

-a/-ɔ	Caiyuan 哈尼语(Biyue,Pijɔ)
-o/-u	Dafang 彝语、勒期语
-a/-ɔ/-o	Kaduo 语
-a/-ɯ/-o	Bean 语、怒苏怒语、喜德彝语
情况更复杂的	基诺语、丽江纳西语、永宁纳西语

通过数据一般能确定导致多个元音对应形式的决定因素。但有时无法找出明确的原因。

2.2.1 能找出明确的决定因素的语言

导致多个元音对应形式的决定因素包括:

(a)半元音-y-和-w-的影响

见附录Ⅲ中拉祜语的数据,我们能够看出:

-a >(拉祜)-a,-wa >(拉祜)-u,*-ya >(拉祜)-ɛ

(b)声母辅音的影响

阿昌语中的元音对应形式表现出来自半元音与卷舌声母两方面的影响。阿昌语中这些卷舌声母来自原始彝缅语的响辅音或响辅音丛:

占优势的元音对应形式:-ɔ

	原始彝缅语	阿昌语
放下/保持	*ʔda^{2}	thɔ^{31}
休息	*na^{2}	nɔ^{31}
盐	*tsa^{2}	tɕhɔ^{31}
儿子/孩子	*za^{2}	tsɔ^{31} lo^{31}
教	*ʔma^{2}	m̥ɔ^{35}

在*-w 后:-o

	原始彝缅语	阿昌语
竹子	*wa^{2}	o^{31}
牛	*nwa^{2}	no^{31}
一拃	*twa^{1}	tho^{55}
雨	*rwa^{1}	mau^{31} ʐo^{55}

在现代卷舌声母后:-ua

	原始彝缅语	阿昌语
箭	*ʔmra^{2}	kaŋ^{35} m̥ʐua^{31}
听	*gra^{2}	kʐua^{31}
肉/动物	*sya^{2}	ʂua^{31}
拥有/获得	*ra^{3}	ʐua^{35}
精神/灵魂/影子	*ʔla^{3}	pʐua^{55}

注意,-w-明显先于声母卷舌化出现:

雨	*rwa^{1}	mau^{31} ʐo^{55}

在 Dafang 彝语中,*-a 在带原始声调*2 的词中有规律地变成了-u(见下),但是在带有鼻音声母的词中发展成了-ɒ 或-ɔ,例如:

*mya^{2}	许多	ɳɒ^{33}
*ʔŋa^{2}	借出/归还	ŋɒ^{33}
*ŋa^{2}	五	ŋɒ^{33}
*na^{22}	休息/暂停/停止/保持	nɒ^{33}
*ŋa^{2}	鱼	ŋɔ^{33}

(c)语法功能

小品词与其他有重要语法功能的高频语素一般是非重读的,这对它们的元音和声调都有影响。含有原始彝缅语 *-a 韵母的最重要的功能词是 *ma(否定词)和 *da(祈使语气的否定词)。阿昌语和 Dafang 彝语中相应的词都说明了这一点,作为例外保留了-a 韵母:

	原始彝缅语	阿昌语	Dafang 彝语
否定词	*$ma^{2/3}$	ma^{31}	ma^{21}
祈使语气否定词	*da^{2}	ta^{31}	$t^{h}a^{21}$

(d)原始声调

我们的数据显示,语素会根据不同的原始声调而发展出不同的元音对应形式,有两个最显著的例子:在 Caiyuan 哈尼语(Biyue,Pijɔ)中,有 *-a 韵母且带原始声调 *1 的语素,现在都有元音-a,而带原始声调 *2 的语素都有元音-ɔ。(带原始声调 *3 的语素可能有其中任何一个,条件还不清楚。)见附录Ⅳ。

相似地,在 Dafang 彝语中,有 *-a 韵母且带原始声调 *1 的语素,现在都有元音-o,而带原始声调 *2 的语素都有元音-u。见附录Ⅴ。

(e)复合词词首语素丢失重音

"鼻子""耳朵""前额"三个身体部位词项在原始彝缅语阶段是同音的,它们都来自于原始彝缅语的 *$ʔna^{2}$。因此,现代各个语言为了区别意义,都衍生出了双音节或三音节的复合词,例如拉祜语 nā-qhɔ̂"鼻子",nā-pɔ̂"耳朵",nā-qā-pɤ"前额"。复合词产生之后,词首音节就会丢失重音,变为中性元音,或是与这种语言中 *-a 的规律对应形式不同的元音。两种情况在阿昌语中都存在:*-a 在一些复合词中变成了-i,在另一些中变成了非重读的-ă:

先看语素出现在复合词词首的情况:

	原始彝缅语	阿昌语
耳朵	*$ʔna^{2}$	ni^{31} ŋɔŋ^{55}
鼻子	*$ʔna^{L/2}$	ni^{31} tʂhua^{31}
麻雀	*m-dza	tsi^{55} tʂyak^{55}

再看复合词词首语素中的元音弱化:

鱼①	*$ŋa^{2}$	ŋa^{31} ʂua^{31}
前额	*$ʔna^{2}$	ŋă^{31} tha^{55}
儿子/孩子	*za^{2}	tsă^{31} oi^{31}

(f)借用或方言混合

从亲属语言(另一种彝语方言或汉语)中借来的词,可能完好地保存源语言中的元音。阿昌语的 ʐa^{31} pa^{31}"哑巴/沉默的人"不是原始彝缅语 *ʔg-(y)$a^{2/3}$ 的直接后代,而是借自汉语的 yǎba。相似地,Dafang 彝语的 pu^{21}"修补"(来自原始彝缅语 *pa^{1})的元音不是-o,不符合带原始声调 *1 的词的变化规律(见上文(d)和附录Ⅴ)。它更有可能是来自汉语的借词(普通话 bù)。

(g)不一致的或严格的记音

不同的田野调查者可能偏好使用不同的符号,或过于严格地标写非音位性的变体。不同的语言学家可能会把同样一个/a/音位记成"a"或"-ɑ"或"-ɐ"或"-ɒ",取决于它出现的不同环境。

2.2.2 尚未找出明确的决定因素的语言

-a/-ɔ/-o	Kaduo 语
-a/-ɯ/-o	Bean 语、怒苏怒语、喜德彝语②
情况更复杂的	基诺语、丽江纳西语、永宁纳西语

① "鱼"是一个特例。文献中的记录是 ŋa^{31} ʂua^{31},字面意思是"鱼肉",但与"前额"和"儿子"进行类比可以发现,它在复合词中也应该发生元音弱化,因此应该写作 ŋă^{31} ʂua^{31}。

② 见 Okell1969;Thurgood1981。

纳西语在某种意义上不属于彝缅语的核心成员,它的韵母和声调的发展都能证明这一点。① 在纳西语中找不到原始彝缅语*-a 韵母的各个对应形式出现的规律模式。见附录Ⅵa 和Ⅵb。

三 对应声调的分类

我们在原始彝缅语中构拟了三个声调。它们在词汇中出现的频率相差极大。声调*2 是最常见的调,出现在 59 个构拟的词根中。其次是声调*1,出现在近一半的词根中(38 个)。声调*3 最为少见,只出现在 18 个词根中。其余还有 20 个词根,它们没有固定声调或变化不规则;其中还包括一些无法根据我们的数据确定原始声调的词项。

原始声调*3 在缅语和其他一些语言中(例如阿昌语、浪速语)都表现为嘎裂声,因此很可能是来源于一个喉辅音韵尾。虽然它必定存在于原始彝缅语系统中,但是它显然是后起的。它参与了缅语和其他语言大量的形态交替,这一事实足以为证。这个原始声调最常见的后代是中平调 33。它几乎没有受到过声调分裂的影响,或许这也能说明它产生得相对较晚。

本研究中涉及的原始彝缅语词根都在附录Ⅶ中列出,按原始声调分组。

每种原始声调都给出了三个有代表性的例子,也列在附录中。

声调*1:百、病、舌头 [附录Ⅷ]

声调*2:苦、盐、儿子/孩子 [附录Ⅸ]

声调*3:拥有/获得、月/月份、精神 [附录Ⅹ]

彝缅语各语言中,声调最好地保持了与原始语的一致性的语言都属于缅语支、南傈僳语支和西彝语支,它们相对较少发生声调分裂,即一个原始声调只有一个对应声调。中傈僳语言(例如拉祜语、傈僳语)中原始声调*1 和/或*2 都经历了分裂,分化的条件很清楚,与原始语辅音声母的发音方法有关。彝语各方言(属于北傈僳语支)声调变化最为复杂,很多变化还无法解释。

3.1 没有发生声调分裂的语言

	原始彝缅语声调*1	原始彝缅语声调*2	原始彝缅语声调*3
(缅语支)			
阿昌语	55	31	31ʔ
缅语	平调/	降调/	嘎裂声
Hlaovo 语	HL(降调)	L	H
Hpon 语	ˊ	ˋ	
浪速语	31	35	55(紧喉)
勒期语	31	55	
载瓦语	51	21	
(南傈僳与西傈僳语支)			
阿卡语	高调/˥/	低调/˩/	中调/˧/
Bisu 语	ˊ	ˋ	-
Caiyuan 哈尼语	55	31	33
Dazhai 哈尼语	55	31	33
Kaduo 语	ˊ	ˋ	-
Lalo 语	55/˥/	21/˩/	33
Nanjian 语	55	21	33
Phonoi 语	55/˥/	21/˩/	
Shuikui 语	55	31	33

① 见 Matisoff1991,文中提出了"缅-纳西-Lolo"的概念,从而可以包括彝缅语的主体和纳西语。

3.2 声调分裂的决定因素

3.2.1 辅音声母的发音方法

这是目前发现的决定彝缅语言声调分裂的最重要因素。下面是一些例子：

	原始彝缅语声调*1	原始彝缅语声调*2	原始彝缅语声调*3
Ahi Mile 语	33	21	
		55(在原始喉音声母①、擦音声母后)	
波拉语	55	31(在原始浊声母后)	35(紧喉)
		35(在原始清声母、喉音声母后后)	
Dafang 彝语	21	33	
	33(在原始喉音声母、擦音声母后)	55(在原始喉音声母后)	
拉祜语	31(在原始浊声母后)	53(在原始清塞音、浊塞音后)	33
	33(在原始清声母、喉音声母后)	11(在原始喉音声母、清擦音声母后)	
Lipho 语	33	21	33
		55(在原始喉音声母后)	
傈僳语②	平调(在原始清声母、浊声母后)	低降调	
	高降调(在原始喉音声母后)	高升调(在原始喉音声母后)	高降调
Nasu 语	21	33	
	33(在原始喉音声母后)	55(在原始喉音声母后)	
Nosu 语	33	33	33
		55(在原始喉音声母后)	
撒尼语	33	21	
		55(在原始喉音声母后)	

3.2.2 词根所属的词类

Srinuan(1976)③在 Mpi 语(属南傈僳语支)中发现了这一罕见的现象。每个原始声调(不管音节是收舒声还是收促声)都一分为二,条件是词根属名词还是动词：

	原始彝缅语声调*1	原始彝缅语声调*2	原始彝缅语声调*3
名词	6	2	4
动词	5	1	3

	原始傈僳语带高调的促声音节	原始傈僳语带低调的促声音节④
名词	$ʔ^4$	$ʔ^2$
动词	$ʔ^3$	$ʔ^1$

从语音上来看,动词的声调末尾向上弯曲,这可能是一个现已消失的、零声母的名物化词缀的反映。

四 有待研究的课题

虽然彝缅语称得上藏缅语族中目前研究得最好的一个分支,但是研究中仍然存在许多问题：

① 注意,其他一些语言中,也有原始声调*2 受到喉化声母的影响产生出高平调的。

② 傈僳语的声调分裂首先由 Burling(1968)观察到。他总结出了在缅甸通行的六种彝缅语的声调发展途径,其中三种属缅语支(缅语、Atsi 语、载瓦语),三种属傈僳语支(阿卡语、拉祜语、傈僳语)。

③ Srinuan 把 Mpi 语的声调编为 1 至 6 调。见 Matisoff 1978, p. 20。

④ 傈僳语促声音节声调分裂的复杂条件(与本文无关)请参见 Matisoff 1982。

——许多彝缅语言和方言中声调分裂背后的决定因素,还没有进行细致的寻找①,有待于进一步研究阐明。这需要全面研究原始彝缅语声母发音方法在每种语言中的现代反映形式。

——对韵母发展的研究也遗留了许多问题,特别是这一族语言中的北支(我们通常说的"彝语")

——还要继续探讨一些已取得成果的课题,包括来自泰语和汉语的借词问题。(一个很好的例子是原始彝缅语 *pa^{1}"布",这是一个来自泰语的古借词。)

——在多种语言中都有广泛分布的双音节复合词也值得深入研究。至少有两个这样的词的两个音节都有元音-a:*sa^{0}-la^{2}"棉花"和 *ša^{1}-ma^{1}"玉米"。它们显然是借词,但其他词并不是,例如"羞耻"(参考拉祜语 ʔa?-tɔ)和"主人"(参考拉祜语 jɔ̂-mɔ̂),它们存在于多种倮倮语言中,而且都包含原生的双音节语素。

① 这些情况复杂的语言包括 Beishan 语、基诺语、Luquan 语、墨江哈尼语、南华彝语、纳西语、Neisu 语和喜德彝语。