Proto-Kra

by

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CHAPTER 1

INTRODUCTION

1.1. Scope and Objectives.

This study presents a phonological comparison and reconstruction of the Kra language group, which includes the following six languages and their varieties: Gelao, Lachi, Laha, Paha, Buyang, and Pubiao. The Kra language group constitutes a branch of the Kra-Dai stock, and is related to the other more well-known language groups such as Tai, Kam-Sui, and Hlai. (For discussions of the terms *Kra* and *Kra-Dai*, see 1.4 and 1.5). Figure 1 shows an approximate genetic grouping of the Kra-Dai family, which should be taken as provisional. Detailed discussions of the subgroupings of Kra-Dai languages as a whole are beyond the scope of this study.

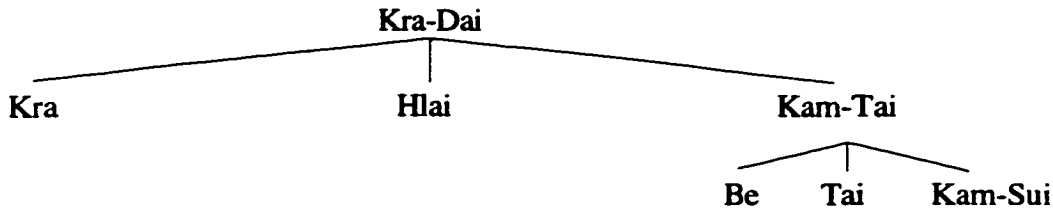


Figure 1: Rough scheme of Kra-Dai family

Following this Introductory Chapter, we will propose in Chapter 2 the internal subgrouping of the Kra languages, including discussions of their varieties. In Chapter 3, the Proto-Kra tonal system and its reflexes in each daughter language will be laid out, and the relation between this tonal system and that of other Kra-Dai languages will be demonstrated. Chapter 4 to Chapter 6 present the reconstruction of Proto-Kra initials and rimes as well as their development from the proto-stage to modern dialects. Chapter 7 sums up the study and includes a selected list of over three hundred Kra etyma. The result of the study is expected to constitute a basis for future historical and comparative studies of Proto Kra-Dai.

1.2. The Kra languages as Kra-Dai languages.

Three Kra languages, Gelao, Lachi and Laqua (=Pubiao), plus the Hlai language of Hainan were grouped together as a linguistic stock called Kadai by Benedict (1942), who proposed them to be related to the Tai language. (The Laha language was later included in Benedict (1975) as a Laqua dialect). Of these, only the Hlai language has been reported in great quantity and with reliable quality (e.g. Wang and Qian 1951, Ouyang and Zheng 1983). Few scholars have doubted the relation of Hlai to Tai, though phonological correspondences between them have yet to be worked out. (According to our present knowledge, however, this Hlai language has to be considered a separate branch from the other three. Cf. also Figure 3 for evidence that Hlai does not belong to our Kra language group) . The relation between Benedict's other Kadai languages and Tai, however, has remained dubious to many students of comparative Tai, partly due to the meager data available on the former languages and to a number of doubtful etyma proposed by Benedict based on limited and low-quality material. Recently, Chinese and Vietnamese scholars have gathered more data on these lesser known languages, including some other related languages hitherto unknown (e.g. Buyang in China). But no one has yet presented systematic evidence to bind the whole family together, rather than just random lists of a few forms.

We are offering in Figure 2 a list of 40 selected Kra-Dai etyma (including seventeen items from the Swadesh 100 basic word-list) to demonstrate that the Kra languages and the other Kra-Dai languages belong to the same linguistic stock. The list is not intended to be exhaustive, yet just browsing through its first fourteen body part and body function etyma will probably leave little doubt as to the genetic relationship among these languages. On the other hand, Figure 2 is not a mere list of raw material or look-alikes, but includes already well-analysed data. In other word, we consider them as valid cognates provable by their regular phonological correspondences established in the following chapters of this study. Readers will see, for example, that all tones of the Kra

languages are indicated according to the proto tone classes (i.e. proto-tones *A, *B, *C and *D), similar to what has been known in such languages as Tai and Kam-Sui. Chapter 3 of this study is referred to for an extensive treatment of the Proto Kra-Dai tonal system. Similarly, the initial and rime correspondences are also considered regular according to the systems proposed from Chapter 4 to Chapter 6 of this study.[1]

These selected etyma are also offered as a handlist for determining whether a certain language belongs to the Kra-Dai family. They cover examples of all four possible proto tones, and thus are also intended to serve as a tonal checklist for fieldworkers to figure out the tonal system of a certain Kra language in a historical and comparative context. The problem of tonal correspondence among the Kra languages, and between them and other Kra-Dai languages, is a key factor which has held up progress in this comparative field for several years (cf. Liang 1990: 52, who stated that, "There is no obvious [tonal] correspondence between Ge-Yang (= "Kra") and Kam-Tai. Even within the Geyang group there is no [tonal] correspondence among the languages").

The representative varieties of the languages in Table 1 are as follows: Wanzi (Gelao), Jinchang (Lachi), Nong Lay (Laha), Yanglian (Paha), E-Cun (Buyang), Pufeng (Pubiao), Baoding (Hlai), Sanchong (Sui), and Siamese (Tai). When the related forms are unavailable in the representative dialects, forms from other varieties may be cited. These are indicated by parenthesized abbreviations as follows: (Qs) = Qiaoshang dialect of Gelao, (Lz) = Laozhai dialect of Gelao, (Tm) = Ta Mit dialect of Laha, (Lj) = Langjia dialect of Buyang, (L) = Lao dialect of Tai. Material on Wanzi dialect of Gelao is from He (1983); Nong Lay Laha from Solntseva and Hoang (1986), Ta Mit Laha from Dang et al (1972), Hoang and Vu (1992), and Gregerson and Edmondson (1997); Hlai dialects from Ouyang and Zheng (1983); and Sanchong Sui dialects from Zhang (1982). Material on the rest are from my own fieldwork. The numbers 1 and 2 following proto tones (*A, *B, *C and *D) indicate respectively early voiceless and voiced onsets in the respective languages. (For details, see Chapter 3).

Figure 2: Selected Kra-Dai etyma

	1. Blood	2. Bone	3. Ear	4. Eye	5. Excrement
Gelao	plɒ D1	taŋ D2	zau A2	tau A1	qɒ C1
Lachi	pjo D1	tfijɒ D2	lu A2	tju A1	kạ C1
Laha	plaat D1	dak D2	khlaa A2	taa A1	kai C1
Paha	pɛɛ D1 -f	---	kaa A1	ʔdaa A1	qɛɛ B1 -t
Buyang	---	---	ðaa A2	taa A1	---
Pubiao	---	ʔdak D1	rfiɑɑ A2	tee A1	---
Hlai	ɬaat D	vuuuk D	(zai A)	tshaa A	haai C
Sui	phjaat D1	laak D1	qhaa A1	ndaa A1	qee C2
Tai	luat D2	duuk D1	huu A1	taa A1	khii C1/2

	6. Fart	7. Fingernail	8. Hand	9. Intestine	10. Knee
Gelao	tæ D1 (Lz)	klẹ D1	mpau A2	sai C1	qo B1 (Lz)
Lachi	tɛ̣ D1	lɛ̣ D1	m̩ A2	ci C1	kwɛ B1
Laha	---	kləp D1	maa A2	si C1	---
Paha	ðat D1	ɣap D1	---	ðfiii B1 -t	ʁo B1
Buyang	tut D1	lip D2	---	---	huu B2
Pubiao	tɑt D1	(kan A1)	m̩ii B1 -it	sai C1	qau B1
Hlai	thuut D	liip D	meɯ A	raai C	---
Sui	tət D1	ljap D1	mjaa A1/2	haai C1/2	quu B1
Tai	tot D1	lep D2	muɯ A2	sai C1	khau B1

	11. Leg	12. Liver	13. Navel	14. Shoulder	15. Bear
Gelao	qau A1	tæ D1 (Lz)	ʐo A2 (Qs)	---	mi A2 (Lz)
Lachi	ku A1	tjạ D1	tɦjo A2	pɦu B2	mɒ A2
Laha	kaa A1	tap D1	dau A2	baa B2	mɛ A2
Paha	ɣaa A1	tap D1	naau A1	maa B1	mii A1
Buyang	ʔaa A1	tap D1	ʔduə A1	ʔbaa B1	---
Pubiao	---	tjap D1	ʔnau A1	ɱaa B1	mɦje A2
Hlai	haa A	---	veɯ A	vaa B	mui A
Sui	paa A1	tap D1	ʔdwaa A1	---	ʔmii A1
Tai	khaa A1	tap D1	dɯɯ A1	baa B1	mii A1

	16. Bird	17. Chicken	18. Dog	19. Flea	20. Horn
Gelao	ntau D2	qai A1	mpau A1	mpe D1	qa A1
Lachi	njọ D2	kɛ A1	m̩ A1	mạ D1	kwɛ A1
Laha	nok D2	kəi A1	maa A1	---	kou A1
Paha	nɦook D2	qai A1	maa A2	mɦat D2	ɣuu A1
Buyang	nuk D2 (Lj)	ʔai A1	---	mat D1	ʔuu A1
Pubiao	nok D2	qai A1	ɱaa A1	ɱat D1	qau A1
Hlai	---	khai A	pou A	poot D	hau A
Sui	nok D2	qaai B1	ɱaa A1	ɱat D1	paau A1
Tai	nok A2	kai B1	maa A1	mat D1	khau A1

	21. Head louse	22. Pig	23. Tail	24. Cogon-grass	25. Sesame
Gelao	ta A2 -t	mpa A1	tshan D1	qe A1 (Qs)	ŋklau A2
Lachi	---	mje A1	sɛ D1	ku A1	---
Laha	tou A1	məu A1	cot D1	khaa A2 -it	---
Paha	ðfiuu A1	muu A2	jɐt D1	qaa A1	ŋaa A2
Buyang	tuu A1	muu A1	cut D2	ʔaa A1	ŋaa A2
Pubiao	---	ɱuu A1	sɑt D1	qaa A1	ŋfiɯɑ A2
Hlai	fou A	pou A	tshuŧ D	hjaa A	keɯ A
Sui	tuu A1	ɱuu B1	hət D2	jaa A1	ʔŋaa A1
Tai	hau A1	muu A1	---	khaa A2	ŋaa A2

	26. Yam	27. Field	28. Fire	29. Road	30. Bitter
Gelao	mbø A2 (Qs)	---	pai A1	qen A1	qan A1
Lachi	mfia A2	nu A2	pje A1	khĩ A1	kã A1
Laha	mal B2 -t	naa A2	pəi A1	hon A1	kam A1
Paha	man A2	--	pui A1	---	qam A1
Buyang	man A2	naa A2	fii A1	hun A1	ʔam A1
Pubiao	mfiən A2	nfiee A2	pei A1	qxwan A1	(ʔdaai B1)
Hlai	man A	taa B -t	fei A	kuun A	hoom A
Sui	man A2	---	vii A1	khwən A1	qam A1
Tai	man A2	naa A2	fai A2	hon A1	khom A1

	31. Deep	32. Dry	33. Far	34. Old	35. Raw
Gelao	laŋ D2	xau B1	lai A2	qa B1	te D2
Lachi	lfijo̱ D2	ku B1	lje A2	kwɛ B1	tfije̱ D2
Laha	lak D1	---	kləi A2	kou B1	kthop (Tm)
Paha	lfiak D1	qfiaa B1	ðfiii A1	quu B1	---
Buyang	lak D1	haa B1	lii A2	ʔuu B1	ʔdip D1
Pubiao	ɬak D1	qɣaa B1	qxai A2	qau B1	ʔdap D1
Hlai	ɬook D	kheɯ B	lai A	khau B	viip D
Sui	---	---	ʔdii A1	qaau B1	ʔdjup D1
Tai	luk D2	khaɯ B1 (L)	klai A1	kau B1	dip D1

	36. Thick	37. Dream	38. Fall	39. Laugh	40. Grand-mother
Gelao	ntau A2	pan A1	tau D1	sa A1	zɒ C2
Lachi	nju A2	pã A1	tjo̱ D1	cu A1	zu̱ C2
Laha	naa A2	pan A1 (Tm)	tok D1	sɔ A1	jaa B1
Paha	naa A1	van A1	tɔɔk D1	ðfiɯɯ A1	jfiaa C2
Buyang	naa A2	pan A1	tuk D1	θoo A1	jaa C2
Pubiao	nfiee A2	pan A1	---	θaau A1	---
Hlai	naa A	fen A	thok D	raau A	tsaɯ 3
Sui	ʔnaa A1	vjan A1	tok D1	kuu A1	jaa C2
Tai	naa A1	fan A1	tok D1	hua A1	jaa B2

1.3. Kra as a well-defined Kra-Dai branch.

In this section, we will demonstrate that the Kra languages constitute a well-defined subgroup separate from the other branches of Kra-Dai. The task here is thus to show that these languages share some features lacking in the other sister languages.

Benedict (1942) noted a score of examples, numerals apart, which were intended to serve to tie his Kadai group together. Most items, however, also have related forms in Tai, thus the basis for defining a distinct group was somewhat shaky. Moreover, his original Kadai stock does not cover the same languages as our Kra group here; as we will see from Figure 3, Hlai does not belong to our Kra group.

Liang (1990) has included most of our Kra languages as a group he called Ge-Yang. Refering to the percentages of shared cognates among the languages (based on about 200 words), he claimed that these languages share higher percentages among themselves than each of them does with other members of the family. However, he did not give examples of the proposed cognates on which he based his statistics, and thus provided no evidence for us to evaluate.

We are offering here some qualitative evidence, showing thirty etyma found exclusively in the Kra languages. The list is selected to include only etyma which have reflexes in at least three of the four subgroups (cf. Chapter 2); i.e. one from either Gelao or Lachi (Western-Kra), another from either Laha or Paha (Southern-Kra and Central-Kra), and the other from either Buyang or Pubiao (Eastern-Kra). While there is a possibility that future research may suggest some of these etyma as non-exclusively Kra, we believe that the majority of them will stand as valid subgrouping criteria. Note that the other sister branches do not necessarily have the related forms among themselves for these etyma.

Figure 3: Special Kra etyma

	1. Pus	2. Meat/Flesh	3. Deaf	4. Fat	5. Good
Gelao	ŋka B1	ʔɒ C1	ŋan C2	nan A2	ʔɒ A1
Lachi	ŋfiũ B2	ʔo̤ C1	ŋ̊fia C2	nfija A2	ʔa A1
Laha	---	ʔəu C1	ŋal C2	mnal B2 -t	ʔai A1
Paha	ŋfiuu B1	ʔaau C1	---	nan A2	ʔaai A1
Buyang	muu B1	ʔuə C1	ŋan C2	nɛn A2	---
Pubiao	hau B1	ʔjau C1	ŋan C2	nfiin A2	ʔai A1
Hlai	gwiu C	gom C	ɬook D	gwei C	ɬe̤n A
Sui	sok D2	naan C2	ʔdak D1	pii A2	ʔdaai A1
Tai	nɔɔŋ A1	nɯa C2	nuak D1	phii A2	dii A1
	6. Itchy	7. Ripe	8. Satiated	9. Smelly	10. White
Gelao	tau D2	ŋka B1	tshai B1	mpa B2	ʔau D1 (Lz)
Lachi	---	ŋ̊i B1	sɛ B1	mfiĩ B2	ʔi D1
Laha	dok D2	ŋ̊əu B1 -i	ci B1	məu B2	ʔuk D1
Paha	dɔɔk D1	muu B1	---	mfiuu B2	lɔɔk D1
Buyang	ʔduk D1	muu B1	θii B1	---	ʔɔɔk D1
Pubiao	---	---	---	mfiuu B2	---
Hlai	khom A	fui A1	khɯɯm A	---	khaau A
Sui	ɬit D1	sok D2	tjaŋ B1	ŋ̊uu A1	paak D2
Tai	khan A2	suk A1	ʔim B1	men A1	khaau A1

	11. Wildcat	12. Hawk	13. Star	14. Water	15. Wind
Gelao	qa C1	li C2	zoŋ A2 (Qs)	ʔəɯ C1	ven A2
Lachi	kwɛ̱ C1	lfii C2	lfiei A2	ʔi̱ C1	---
Laha	---	klaaŋ C2	kluŋ A2	ʔuŋ C1	van A2
Paha	quu C1	ðaaŋ C2	ðɔɔŋ A2	ʔɔɔŋ C1	vum A2
Buyang	ʔuu C1	laaŋ C2	lɔɔŋ A2	ʔɔɔŋ C1	vən A2
Pubiao	qau C1	laaŋ C2	lfiuuŋ A2	ʔɔŋ C1	---
Hlai	huui C	ŋaau A	raau A	nom C	hwoot D
Sui	peu B1	ŋ̊aau A2	zət D1	nam C1/2	zum A1/2
Tai	---	jiau B2	daau A1	naam C2	lom A2

	16. Do	17. Forget	18. Give	19. Go	20. Hatch
Gelao	tha A2	te D2	ni D2	vu C2	qan C1
Lachi	tfije A2	tfija̱ D2	---	vu C2	kā̱ C1
Laha	dəu A2	dap D2	nak D2 -v	vaa C2	---
Paha	duu A1	dap D1	nfiaak D2	vaa C2	qam C1
Buyang	ʔduu A1	ʔdap D1	naak D2	vaa C2	ʔam C1
Pubiao	---	ʔdjap D1	---	---	qam C1
Hlai	vuuk D	luuum B	tuuuŋ B	hei A	phook D
Sui	hee C2	laam A2	haai A1	paai A1	pjam A1
Tai	tham A2	luuum A2	hai C1	pai A1	fak D2

	21. Have	22. Hear	23. Plant (v.)	24. Steal	25. Wear
Gelao	ʔo A1 (Lz)	tsaŋ D2	tan C1	len C2	lai C2
Lachi	ʔĩ A1	jo̱ D2	tjã̱ C1	lfĩ̱ C2	lfijo C2
Laha	ʔan A1	jak D2	tam C1	---	lɛ C2
Paha	ʔan A1	jfiak D2	tam C1	lfiam C2	lfiii C2
Buyang	ʔan A1	---	tam C1	luəm C2	lee C2
Pubiao	ʔan A1	tɕak D2	tap C1	---	---
Hlai	tsau B	pleɯ A	gwaa A	zok D	tshat D
Sui	me A2	di C1	mba A1/2	ljak D1/2	tan C1
Tai	mii A2	-yin A2	pluuk D1	lak D2	sai B1

	26. Nest	27. Sieve	28. Y.Brother	29. Two	30. Four
Gelao	tsɒ C1	vi A2	tsəɯ B2	su A1	pu A1
Lachi	to̱ C1	vei A2	ʑfio B2	su A1	pu A1
Laha	---	---	jau B2	saa A1	paa B1 -t
Paha	ðaau C1	vaaŋ A2	---	θaa A1	paa A1
Buyang	---	vaaŋ A1	juə B2	θaa A1	paa A1
Pubiao	θoo C1	---	---	ɕee A1	pee A1
Hlai	ruuk D	doŋ C	guuŋ A	ɬau C	tshau C
Sui	kuŋ A1	doŋ C1	nu C2	ɣa A1/2	ɕii B1
Tai	raŋ A2	doŋ C1	nɔɔŋ C2	sɔɔŋ A1	sii B1

1.4. Kra as autonym 'Human Being'.

We have called the language group under study here *Kra*, and we are obliged here to explain our choice. It has already been mentioned in previous sections that the existing term "Kadai" is not proper for our purpose, since it does not refer precisely to the same language group we are working with. Moreover, since its inception in 1942, the term has been elusively used in many different senses both by Benedict himself and by others. It is sometimes used as a cover term to vaguely refer to any languages other than the more well-known groups such as Tai and Kam-Sui. It is also sometimes used to refer to the whole family (in this sense, many lesser known languages are often loosely dubbed as 'Kadai outlier languages' without necessarily implying close affiliation among them).

Our term *Kra* is intended to refer to the well-defined distinct group we have demonstrated in the previous section. In addition, the term is, we are proposing, the reconstructible form used as an autonym in a number of Kra languages. This autonym means 'person, human being' in many varieties, and we believe it to be the original meaning of the term.

We will first show that *Kra* is the common form of autonyms used by various Gelao dialects. Three varieties representing different Gelao branches will be taken as examples here (for subgrouping of Gelao dialects, see Chapter 2). These are Wanzi, Qiaoshang and Laozhai, which respectively represent Central, Northern and Southwestern groups. The autonyms in these varieties are as follows: Wanzi /klau^{55}/, Qiaoshang /ɣe^{45} /, and Laozhai /ʔlɤɯ^{33}/. The Qiaoshang form also means 'human being'.

First, all these forms belong to the same tone class: C1. (See Chapter 3 for details and discussions of the established tone classes).

	Tone class	Wanzi	Qiaoshang	Laozhai
"Kra"	C1	klau 55	ɣe 45	ʔlʏɯ 33
Water	C1	ʔəɯ 55	ʔau 45	ʔn̩ 33
Plant (v.)	C1	tan 55	tø 45	tā 33
Excrement	C1	qɒ 55	qai 45	qæ 33
Interstine	C1	sai 55	sei 45	ɕi 33

Second, all these forms go back to the proto-rime *-a. Since Gelao languages have undergone relatively drastic changes of rimes, and no representative varieties here reflect this proto rime faithfully as -a, we are also providing below the Laha or Buyang (By) forms for comparison. (For details and discussions on the Proto-Gelao rime correspondences, see Chapter 4).

	Proto-rime	Wanzi	Qiaoshang	Laozhai	Laha
"Kra"	*-a	klau C1	ɣe C1	ʔlʏɯ C1	khlá
Cogon	*-a	(saŋ B1)	qe A1	qʏɯ A1	ʔaa A1 (By)
Light (a.)	*-a	xau C1	xe C1	qʏɯ C1	khaa C1
Snake	*-a	ŋkau A2	ŋge A2	ŋʏɯ A2	ŋaa A2
Dry	*-a	xau B1	---	qʏɯ B1	haa B1(By)
Bran	*-a	pau B1	---	pʏɯ B1	paa B1

For the complex onset, *kr-, Wanzi and Laozhai varieties show modern reflexes of the medial as -r- only when followed by shwa. Otherwise their reflexes have completely merged with those of *kl-. In Qiaoshang, the two onsets are generally distinguished: kw- for *kl- and ɣ- for *kr-. (See Chapter 4 for details on reconstructing Gelao initials).

		Wanzi	Qiaoshang	Laozhai
"Kra"	*kr-	klau C1	ɣe C1	ʔlɤɯ C1
Head	*kr-	klɒ B1	ɣai B1	ʔrə B1
House	*kr-	qə̀ A1	ɣai A1	ʔrə A1
Contrast with:				
Close eye	*kl-	kle D1	kwa D1	ʔlæ D1
Lazy	*kl-	kle D1	kwī D1	ʔlæ D1
Grandchild	*kl-	klu A1	kwai A1	---

The common ancestor of the Gelao, we have thus demonstrated, called themselves **kra C*, whose original meaning is 'human being'.

The Laha people of Vietnam often use the autonym /khlá/ followed by different attributions to designate verieties. For instance, Khlá Phlạo (literally "Dry Laha") refers to the Laha at Nong Lay (Nl) location, which is the representative dialect in this study.

The initial *kr-, with -r- inducing aspiration, becomes Laha khl-, contrasting with *kl- which becomes Laha kl-.

			Laha (Nl)	Gelao (Wz)	Gelao (Qs)	Gelao (Lz)
"Kra"	*kr-	C1	khlá	klau	ɣe	ʔlɤɯ
Grandson	*kl-	A1	klaal	klu	kwai	---
Close eye	*kl-	A1	klap	kle	kwa	ʔlæ

The rime correspondence presents no difficulty. Laha -a is the straightforward reflex of proto *-a. Examples have been already provided in the previous comparative table with those of Gelao dialects. The material available, unfortunately, does not indicate tones for this Laha form /khlá/ in a manner which we may reliably interpret.

Another variety of Laha at Ta Mit (Tm) location has the corresponding autonym /la33 ha21/. The first morpheme /la-/ is prefixed to a number of words designating human relations, and is most likely a reduced form of /laak34/ 'child, offspring'. It is the latter morpheme /ha 21/, which corresponds to Nong Lay Laha /khlá/. The correspondence Nong Lay *khl-* vs Ta Mit *h-* is regular. For instance, Nong Lay /khlaa2/ Tamit /ka33 hu33/ 'ear'; Nong Lay /khlaat1/ Ta Mit /ko212 haat34/ 'crab'. (Ta Mit /ka-/ is prefixed to a number of body parts, e.g. ka33 ma33 'hand'; while /ko-/ is commonly prefixed to many animal forms, e.g. ko212 kap23 'duck').

Ta Mit tone /21/ rightly points to the proto-tone class *C, but, if no tonal change in context may be assumed, appears to indicate initial series 2 rather than series 1 (Tone C1 is reflexed as Ta Mit /31/ or /212/, the latter variant typically occurs with early voiceless aspirated and fricative initials; see Chapter 3).[2]

In any case, these Laha forms /khlá/ and /ha^{21}/ seem to unmistakably represent the common autonym with those of Gelao *kra C.

The Lachi form for 'human being' is /(ʔa) hu 33/. We suggest that this form, too, is of common origin with those Gelao and Laha autonyms. Both Lachi /-u/ as a reflex of the proto-vowel *-a and Lachi tone /33/ as a reflex of tone class C1 are completely regular.

-Lachi tone /33/ and proto tone class C1

	Tone class	Lachi	Gelao (Wz)	Laha (Nl)
"Kra"	C1	hu̯ 33	klau 55	khlá
Water	C1	ʔi̯ 33	əɯ 55	ʔuŋ 6
Plant (v.)	C1	tjã̯ 33	tan 55	tam 6
Excrement	C1	ka̯ 33	qɒ 55	kai 6

-Lachi rime /u/ and proto rime *-a

		Lachi	Gelao (Wz)	Laha (Nl)
"Kra"	C1	hu̱ C1	klau C1	khlá
eye	A1	tju A1	tau A1	taa A1
leg	A1	ku A1	qau A1	kaa A1
bran	B1	pu B1	pau B1	paa B1

Lachi h-, however, is not a regular reflex found in native etymologies. The normal Lachi reflex of *kr- is /kh-/.

		Lachi	Gelao(Wz)	Gelao(Lz)
Head	*kr-	khja B1	klɒ B1	ʔrə B1
House	*kr-	kho A1	qə- A1	ʔrə A1

In this case, the initial may be assumed to be influenced by the following vowel. Other Lachi dialects in Vietnam from early records show initial /kh-/ for this word.

	Tone	Jinchang	Bonifacy (1906)	Robert (Ban Phung) (1913)
Person	C1	hu̱ 33	khu	k'ou
Head	B1	khja 45	khá	kha
House	A1	kho 55	---	k'ò

The Paha people call themselves /pa44 haa 44/, which also means 'human being'. The first morpheme also appears prefixed to a few other kinship terms indicating 'male', e.g. /pa33 jfiu 213/ 'son-in-law', and is most likely of the same etymology as /paa 44/ 'father'. The latter morpheme /haa 44/ should appear to be straightforwardly relatable to the form *kra. The correspondences are, however, somewhat irregular. The tone points

rather to tonal class B1 (Paha normal reflex of tone C1 is /45/), though there are also a few other examples where Paha shows tone B1 for etymologies which regularly belong to the C1 class, e.g. Paha /ðhii44/ 'intestine' and /qɛɛ44/ 'excrement'. The initial /h-/ is not normally found in native words. For the complex initials *kr- and *kl-, Paha often has /q-/ as a reflex and there does not seem to be an apparent condition for its variant occurence as /h-/ in this etymon.

		Paha	Laha (Nl)	Gelao (Wz)	Lachi
House	*kr-	qaan A1	---	qə- A1	kho A1
Sun	*kl-	qaaŋ A1	klaaŋ A1	klei A1	---

Despite the irregularities in this last form, we feel that our proposal to use the term *Kra* to designate this group of languages and people has been justified. The fact that other sister languages such as Buyang do not appear to share this common etymon does not necessarily vitiate the proposal.[3] The term is unique and represents a majority of speakers of the language group (including the Gelao who are the most diverse and the most numerous). A similar scenario can be referred to in the Tai branch, where the term "Tai" has well represented the whole group although several varieties have used other names as their autonyms (such as "Yi/Yay" in most Northern Tai varieties or "Nung" in a number of Central Tai varieties).

1.5. Kra and Kra-Dai

We propose to call the whole language stock, to which Kra and other sister languages belong, *Kra-Dai*. The term follows the popular tradition of juxtaposing two big language members of the family, which sometimes are also linguistically distant enough from each other to give the feel of the whole family (cf. Sino-Tibetan, Tibeto-Burman, Mon-Khmer etc). Such "dual" names appear to have proved practical; the

longer names have seemed to be less successful in competition. For instance, the term "Kam-Tai" which represents the Tai and Kam-Sui branches have quickly taken over the older names such as "Tai-Kam-Sui-Mak" (the last three members belong to the Kam-Sui branch).

The motivation for picking up the "Dai" part of the term is obvious. It is the reconstructed form for autonyms of various Tai groups (variable as either /tai A2/ or /thai A2/, depending on the respective sound changes *d- > t- or th-). Of all family members, Tai is undoubtedly the most well-known and most numerous, and has achieved the most complex political and cultural entity. Any term for this family which omitted Tai would be just like Sino-Tibetan without the Chinese (Sino-).

The pick for "Kra" is supported by the fact that this language group includes quite diverse members, which geographically span a vast area second only to Tai (from Guizhou province of China in the north to Son La province of Vietnam in the south). Another equally diverse group is Kam-Sui, but it unquestionably forms a group with Tai (i.e. Kam-Tai), and this has to be indicated at a lower level. The Hlai branch is just represented on Hainan island, and includes closely related varieties (especially in term of shared lexicon, though phonologically fairly diverse). The Be group is found in an even more limited area (some counties in the northern part of Hainan island), and includes a few very closely related varieties.

For the Thai people who constitute two-thirds of the population of this language family, we also propose the Thai term ข้าไท /khaa C1 thai A2/ for this language family. This is most likely the Thai reflex of the term "Kra-Dai" */kra C1 dai A2/. The latter morpheme of course is the autonym of the Thais themselves.

The word ข้า /khaa C1/ in Thai typically means 'slave'.[4] We would like to suggest that the word is etymologically related to "Kra", the autonym which originally means 'human being'. We may imagine that the term started to appear in Tai languages relatively recently, when the Tai expanded to the west and southwest (from Guangxi to

Yunnan and further west into Burma and Assam and to the Southwest into Vietnam, Laos and Thailand. This etymon is not found in Li's *Handbook of Comparative Tai*, and may not be reconstructible at the Proto-Tai level). This Tai expansion in effect cut through the area native to their Kra sisters, which used to form the west and southwest borders of the family settlements, and probably involved the subjugation of the Kra's by the Tai's. "Kra" then became known as inferior men, and finally also 'slave' to their sibling conqueror. The Tai later applied this term as a prefix to the names of various Mon-Khmer and Loloish tribes they presided over in the area of present-day Thailand, Laos, Cambodia and Vietnam (Cf. the related form in Black Tai /saa C1/, which has been borrowed as Vietnamese /xá/ to designate various inferior ethnic groups in Vietnam).

We also offer this term ข่าไท /kha thai/ as a substitute for ไท–กะได /thai kadai/, which has been transliterated from the term "Tai-Kadai" and introduced into Thai during the last decade. The term /thai kadai/ has often elicited smiles or funny looks from non-linguists (sometimes from linguists as well!) when they first hear it. The author himself has always found it difficult to expect any serious talk about the topic following the introduction of the name, and has felt that the consequence should not be underestimated. What are the sources of such ridicule?

Here may be what has happened. The Thais often add attributions to differentiate various tribes of Tai. Following the Noun + Attribute word order in the language, Thais have terms like *Tai khao* 'Tai + white' = White Tai, *Tai dam* 'Tai + black' = Black Tai (these are mainly based on the colors of the clothes worn by those respective tribes), etc. Now the morpheme กะได /kadai/ has the meaning 'ladder' in Thai. And the feeling the term /thai kadai/ is absurd has stemmed from these combined facts: that syntactically it falls perfectly into the normal pattern, thus /thai kadai/ = 'Tai + ladder', but semantically it is somewhat nonsensical--what on earth is the 'ladder' doing here?

We are hoping that our proposed term ข้าไท /khaaC1 thaiA2/ would become the alternative which will prove to be both historically proper and synchronically practical to the Thais.

Notes for Chapter 1

[1] Irregular reflexes with respect to tones, initials, vowels or finals in any given language will be flagged with the following symbols after the forms: -t (irregular tone), -i (irregular initial), -v (irregular vowel) and -f (irregular final).

[2] Ta Mit has shown certain cases of potential tonal change in context. For instance, tone /343/ which is a normal reflex of proto tone A1 often becomes /24/ when preceded by another syllable, e.g. Tamit /ma33 ta24/, Nong Lay /taa A1/ 'eye'; Tamit /ma33 sam24/, Nong Lay /sam A1/ 'hair', but Ta Mit /tɕɯn343/, Nong Lay /col A1/ 'buy'; Ta Mit /pɯi 343/, Nong Lay /pəi A1/ 'fire'.

[3] For Pubiao, Hoang and Vu (1992) recorded a form /qa gɯa[3]/ 'people', which might be related. The velar initials often offglide before the open low vowel /-a/ in Pubiao, while tone 3 in their transcriptions can be a reflex of either C1 or A2 tone. This may also be a source of the Sino-Vietnamese term *La Qua* used to designate the Pubiao people in some early records, where /la-/ is probably a reduced form of /laak/ 'child, offspring' (cf. Laha).

[4] The word is also used as a first-person pronoun, though it is now considered obsolete and vulgar in Standard Thai. In several dialects, the pronoun may imply humility or inferiority of the speaker toward the hearers, such as the Lao term /khaC1 nɔɔi C2/ (the latter morpheme means 'small') 'little I/man'.

CHAPTER 2

KRA SUBGROUPS AND VARIETIES

2.1. Kra subgroupings.

In this chapter, we will discuss the subgrouping of the Kra languages and their varieties. Liang (1990) has grouped together Gelao and Lachi on the one hand and Pubiao and Buyang on the other. He claimed that the languages within the same branch share a higher percentage of cognates between themselves than each of them does with the other group members. No evidence was provided as to the source of his statistics, though, as we will see below, this grouping of his appears to be partially consonant with ours. In the same work, Paha was mentioned in passing as a variety of Buyang. Some lexical criteria (see 2.4) as well as several unique phonological developments in the language seem to suggest that Paha forms a separate group, however. Liang did not enter the Laha language into his scheme, probably due to his lack of access to material on the language.

There are three main criteria, two phonological and one lexical, that we are offering for subgrouping the Kra languages. The first phonological criterion concerns the reflexes of early implosive initials (2.2), and the second concerns the system of final consonants (2.3). Certain sets of exclusive vocabularies are also found to separate some languages from the others (2.4).

2.2. Criterion 1: The bipartition reflexes of proto implosives.

The reflexes of common Kra implosives, as either early voiced stops (with tone series 2) or early glottalized voiced stops (with tone series 1), bisect the Kra languages into two groups: Gelao, Lachi and Laha on the one hand (tone series 2 reflexes) and Paha, Buyang and Pubiao on the other (tone series 1 reflexes).

As a matter of fact, the reflexes of these sounds in modern languages have developed even further. For instance, in several varieties of Gelao, Lachi and Laha, the voiced stops have already become breathy or devoiced into either aspirated or unaspirated voiceless stops (for details, see sections 2.6 - 2.8). The tonal reflexes in such varieties, however, all belong to series 2 of tones which indicate early voicing of initials. In another group, modern Paha reflexes of these initials are plain voiced stops, but its tonal reflexes belong to series 1 of tones and suggest early glottalized initials.

The retroflexed initial *ɽ is reconstructible on the basis of the Qiaoshang Gelao reflex /z-/ instead of /t-/ (cf. 2.6 and Chapter 4 for details of Proto-Gelao initials). In parallel, the Paha reflex of this retroflexed initial is /ð-/, with tone series 1 which suggests an early glottalized ð- in the language (cf. 'to crow', Figure 4). Paha and Pubiao nasal reflexes (cf. 'navel', Figure 4) are resulted from the influence of an early presyllabic nasal (see Chapter 6 for discussions on Paha and Pubiao initials).

Examples are provided in Figure 4. Unless indicated, the representative dialects are as follows: Laozhai (Gelao), Jinchang (Lachi), Nong Lay (Laha), Yanglian (Paha), E-Cun (Buyang) and Pufeng (Pubiao).

	Do	Forget	Itchy	Bone
	*ɗ-	*ɗ-	*ɗ-	*ɗ-
Gelao	di A2	te D2 (Wz)	tau D2 (Wz)	dæ D2
Lachi	tʃije A2	tʃijạ D2	---	tʃijọ D2
Laha	dəu A2	dap D2	dok D2	dak D2
Paha	duu A1	dap D1	dɔɔk D1	---
Buyang	ʔduu A1	ʔdap D1	ʔduk D1	---
Pubiao	(wak D2)	ʔdjap D1	(ram C2)	ʔdaak D1

Figure 4 Reflexes of proto implosives

	Raw	Crow (v.)	Navel
	*ɖ-	*ɖ-	*ɖ-
Gelao	dæ D2	zã A2 (Qs)	zo A2 (Qs)
Lachi	tfiję D2	tfijõ A2	tfijo A2
Laha	---	daŋ A2	dau A2
Paha	---	ðaŋ A1	naau A1
Buyang	?dip D1	?daŋ A1	?duə A1
Pubiao	?dap D1	?daŋ A1	?nau A1

Figure 4 Reflexes of proto implosives (continued)

2.3. Criterion 2: The loss of labial endings and Western-Kra.

Our reconstruction of Gelao and Lachi rimes (Chapter 4) suggests that the system of final consonants at the stage of the common ancestor of these two languages already lacked labial endings. (Their system of finals thus consists of *-n, *-ŋ, *-t and *-k.) We take this as a development which binds Gelao and Lachi together as the Western-Kra branch.

No modern Gelao and Lachi varieties, in fact, keep this relatively simplified rime system intact. A few Gelao dialects (e.g. Wanzi) keep nasal finals -n and -ŋ, but most have only velar -ŋ, which may further become nasalization of the vowels. Stop endings underwent even more drastic change, yet are indirectly survived in the constriction of the vowel (e.g. in Jinchang Lachi).

Figure 5 provides examples of Proto-Kra rimes *-əm, *-ən, *-əŋ and *-əp, *-ət, *-ək. Both Gelao and Lachi show the same reflexes of rimes ending with labials and alveolars, while distinguish them from those ending with velars. The fact that varieties such as Wanzi Gelao show the alveolar nasal ending (-n) suggests that the labial endings

have merged with alveolars rather than vice versa. The distinctive reflexes of alveolar and velar endings may also surface as contrast of vowel quality (e.g. between -a and -ɒ in Lachi). But, to project such vowel distinctions directly back to common Western-Kra will only create a proto-system with an artificial proliferation of rime contrasts.

	Bitter	Hatch	Dream	Crow (v.)	Peach
	*-əm	*-əm	*-ən	*-əŋ	*-əŋ
Gelao	qan A1	qan C1	pan A1	thaŋ A2	plaŋ A1
Lachi	kã A1	kã C1	pã A1	tfijɔ̃ A2	pɔ̃ A1
Laha	kam A1	---	pan A1 (Tm)	daŋ A2	---
Paha	qam A1	qam C1	van A1	ðaŋ A1	baŋ A1
Buyang	ʔam A1	kam C1 (Mg)	pan A1	ʔdaŋ A1	---
Pubiao	---	qam C1	pan A1	ʔdaŋ A1	paŋ A1

	Liver	Forget	Flea	Deep	Bone
	*-əp	*-əp	*-ət	*-ək	*-ək
Gelao	tæ D1 (Lz)	te D2	mpe D1	laŋ D2	taŋ D2
Lachi	tja̱ D1	tfija̱ D2	ma̱ D1	lfijɒ̱ D2	tfijɒ̱ D2
Laha	tap D1	dap D2	mat D1	lak D1	dak D2
Paha	tap D1	dap D1	mfiat D2	lfiak D1	---
Buyang	tap D1	ʔdap D1	mat D1	lak D1	---
Pubiao	tjap D1	ʔdjap D1	ɲat D1	ɬak D1	ʔdak D1

Figure 5

2.4. Criterion 3: Lexical innovations and Eastern-Kra.

There is a set of words where Pubiao and Buyang appear to share related forms between themselves, but are distinct from those of other Kra languages. We take this as a lexical trace which binds Pubiao and Buyang together as the Eastern-Kra branch. Forms in certain etyma (Figure 6) such as 'buy' may be loaned from Tai separately into Buyang and Pubiao (note the wrong tone category in Buyang, we would expect tone C2). The last example, 'heart', does not show related forms between Buyang and Pubiao. We include it here only to show an instance of independent innovations of Buyang and Pubiao against the retention of Kra roots in the other languages.

	Armpit	Blood	Excrement	Nose	Vegetable
Gelao	tɕi C1 (Lz)	plɒ D1	qɒ C1	ɳtɕe D1	luŋ A2
Lachi	tja C1	pjo D1	ka C1	ɳa D1	lfiū A2
Laha	tai C1	plaat D1	kai C1	ŋat D2 -t	loŋ A1
Paha	taai C1	pɛɛ D1 -f	qɛɛ B1 -t	ŋhat D1	ðuŋ A2
Buyang	lie A2	haa C1	ʔjak D1	tiŋ C1	ʔup D1
Pubiao	lfiii A2	qaa C1	ʔjak D1	tɑŋ C1	ʔap D1

	Bite	Ear of grain	Buy	Heart
Gelao	zɪ B1(Qs)	qan A1	sen A1	ləɯ C1
Lachi	tja B1	kā A1	tɕī A1	lje C1
Laha	tai B1	---	col A1	lul C1
Paha	ðaai B1	ɣan A1	tɕʏn A1	lhin C1
Buyang	ðam C2	ðaaŋ A2	ɕɯɯ A2	θam A1
Pubiao	ram C2	pfijɑɑŋ A2	θɯɯ C2	ŋən C2

Figure 6

2.5. Subgrouping hypothesis.

We are outlining in Figure 7 the picture of Kra subgroups according to the criteria expounded in the previous sections. Numbers 1, 2, and 3 added in the middle of branching lines refer to the three criteria which establish the respective groups.

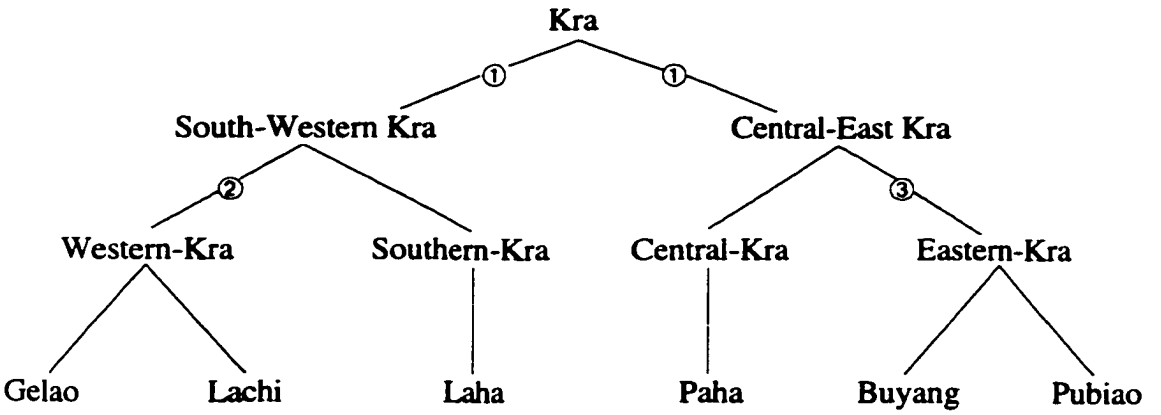


Figure 7 Kra subgroupings

From sections 2.6 to 2.11, we will further discuss the varieties of each of the six languages.

2.6. Gelao varieties.

Gelao varieties are quite diverse and may be divided into three branches: Southwestern, Central, and Northern. In general, Southwestern dialects retain better voicing distinction of initials with fewer tones, while Northern dialects have distinctive spirantal reflexes of what we have reconstructed as the Proto-Gelao retroflex initial series. In Figure 8 and Figure 9, Laozhai, Wanzi and Qiaoshang varieties are taken as representatives of Southwestern, Central and Northern branches respectively. (Laozhai voiced stops and affricates are phonetically accompanied by slight prenasalization, i.e. /b-/ = [^{m}b-] etc.)

		Laozhai	Wanzi	Qiaoshang
cave	A2	boŋ 35	phu 44	poŋ 31
father	A2	ba 35	phɒ 44	pɒ 31
do	A2	di 35	tha 44	tʏu 31
count	C2	dau 33	ta 31	tʏu 33
bone	D2	dæ 31	taŋ 13	tɒ 21
fall	D2	dʏu 31	ta 13	tʏu 21
chopstick	C2	dzɑu 33	tsəɯ 31	tso 33
louse	A2	dʐu 35	tshen 44	tʂø 31
brother	B2	zu 31	tsəɯ 13	so 21
tear (n.)	C2	zi 33	tsau 31	se 33

Figure 8 Gelao voiced stops and affricates

		Laozhai	Wanzi	Qiaoshang	
egg	A1	to 45	tan 33	zø 44	*ʈ-
eye	A1	ti 45	tau 33	ze 44	*ʈ-
raw	D2	dæ 31	te 13	zĩ 21	*ɖ-
crow (v.)	A2	doŋ	thaŋ 44	zã 31	*ɖ-
teach	A1	tʂl 45	səɯ 33	zɒ 44	*tʂ-
mountain	A2	dʐl 35	tsha 44	zʏu 31	*dʐ-
bird	D2	ni 31	ntau 13	zau 21	*ɳ-
snow	A2	ɳi 35	ntai 44	zɪ 31	*ɳ-
near	C2	lʏɯ	lau 31	ze 33	*l-

Figure 9 Gelao retroflex consonants

Thanks to Zhang's work (1993), there are more records of Gelao varieties than for any other Kra languages. However, material on several dialects has often been too terse and at times of uncertain quality. To avoid being overwhelmed with details coming from such ambiguous records, we will have to selectively comment on only a few varieties where data are more extensive and better transcribed.

Three languages from Zhang (1993) may be mentioned first: Niupo (Liuzhi county), Dagouchang (Pingba county), and Longli Mulao (Majiang county). According to the criteria for dialect subgrouping outlined above, we may include these varieties in the Southwestern, Central and Northern branches respectively. Examples are given in Figure 10 and Figure 11. (Zhang's transcriptions of tones may be problematical. Our records of a few languages which Zhang has also investigated disagree quite often with his transcription in this respect.)

		Southwestern		Central	
		Laozhai	Niupo	Wanzi	Dagouchang
father	A2	ba 35	bɑ 33	phɒ 44	phɒ 55
do	A2	di 35	dɑ 31	tha 44	thɒ 33
chopstick	C2	dzɑu 33	dzɑɯ 55	tsəɯ 31	tsə 21
louse	A2	dʐu 35	dzuŋ 31	tshen 44	tshen 55
tear (n.)	C2	zi 33	zɯ 55	tsau 31	tsɑu 21

Figure 10

		Southwestern	Central	Northern	
		Laozhai	Wanzi	Qiaoshang	Longli
egg	A1	to 45	tan 33	zø 44	ze 31
eye	A1	ti 45	tau 33	ze 44	zo 31
bird	D2	ni 31	ntau 13	zau 21	zɑu 53
fat	A2	noŋ 35	nan 44	zø 31	ze 31
thick	A2	ni 35	ntau 44	ze 31	zo 31
near	C2	lɤɯ 33	lau 31	ze 33	zɑ 31
earth	B2	---	la 13	zɤu 21	zɑu 33

Figure 11

Qiaoshang and Longli also appear to share the further devoicing of what Central dialects show as a voiced spirant /v-/. For these etymologies, which are reconstructible as Proto-Gelao *vj- and *vr-, Southwestern varieties often have spirantal reflexes of medial resonants (e.g. z-, ʑ- or ɣ-):

		Laozhai	Wanzi	Qiaoshang	Longli
tall	A2	ʑu 35	vi 44	fy 31	fə 53
wind	A2	ʑu 35	ven 44	fy 31	fɑi 33
fly (n.)	A2	ʐo 35	van 44	fy 31	fe 31

Figure 12

Zhang (1993) divided the Gelao languages into four groups: Central, North-Central, Southwestern and Western. His Central group partially agrees with ours in including such dialects as Wanzi and Dagouchang (also known as the Gao group).

Similarly, his Southwestern group, which includes such varieties as Laozhai and Niupo (also known as the Duoluo group), agrees for the most part with our analysis. However, he included the Qiaoshang variety in his Central group, and considered Longli Mulao as a separate language from Gelao. Both these dialects belong to our Northern branch.

Zhang's North-Central group included Yangliu and Banli varieties, both spoken in Renhuai county. (The former is also known as Green Gelao or Hagei and the latter as Red Gelao). Very limited material has been made available on these dialects, so it is difficult to justify their exact positions in relation to others. Another variety he included in this group is Sanchong (Longlin county, Guangxi province), on which a concise corpus was also provided by Edmondson and Thurgood (1992). Scanty data on another Hagei variety at Qinglong were reported by He (1983). Both Sanchong and Qinglong pattern with Southwestern varieties in retaining voiced stops and affricates (variably prenasalized).

		Southwestern	Hagei	
		Laozhai	Qinglong	Sanchong
cave	A2	boŋ 35	bu 21	---
father	A2	ba 35	---	mba 13
do	A2	di 35	dau 21	---
bone	D2	dæ 21	daŋ 42	ndaŋ 33
body louse	A2	dʐu 35	dʐɛ 21	ndzʔ 31

Figure 13

It is dubious if we should set up a separate branch for these Hagei varieties. (Remember, however, that data available on these dialects are limited.) We will temporarily classify them as a Southwestern sub-branch. It is noteworthy that Sanchong

and Qinglong appear to share a hiherto unobserved unique feature: they have the same reflexes for proto tone classes B and C (Figure 14). It will be interesting to see whether such tonal merger may be found in other Hagei locations and is thus to be considered as a characteristic of the group.

		Southwestern	Hagei	
fire	A1	pai (Wz)	pai 55	pai 35
tree	A1	ti 45	tai 55	tai 35
chicken	A1	qei 45	kai 55	kai 35
cook	B1	to 21	taŋ 42	---
old	B1	qʏu 21	---	kaau 53
water	C1	ʔm̩ 33	ŋ 42	n̩ 53
hatch	C1	qo 33	kaŋ 42	---
excrement	C1	qæ 33	---	ko 53
rain	A2	mʏn 35	məŋ 21	mən 31
snake	A2	ŋʏɯ 35	ŋo 21	ŋo 31
cow	A2	ɳi 35	ɳe 21	ɳai 31
face	B2	lau 13 (Wz)	---	mble 33
hemp	B2	lɒ 13 (Wz)	lie 42	---
horse	C2	ɳi 33	---	ɳo 33
rice	C2	mɑu 33	muŋ 42	---
steal	C2	lã 33	leŋ 42	---

Figure 14

Zhang's Western group included the Pudi variety (Dafang county) and the Bigong variety (Zhenning county). According to the record, the Pudi variety has prenasalized voiceless stops corresponding to the prenasalized voiced stops of several Southwestern varieties (but the author also noted that the sounds may variably become prenasalized voiced stops in certain environments). This feature is shared by a Duoluo variety at Dingyinshao (Zhenning county) reported by He (1983). It is likely that both these varieties may also belong to the Southwestern branch.

		Pudi	Laozhai	Sanchong
field	C2	mpɑŋ 55	^{m}bo 33	---
father	A2	mpɑ 33	^{m}ba 35	mba 13
chopstick	C2	ntso 33	^{n}dzɑu 33	---

		Dingyinshao	Laozhai	Sanchong
cave	A2	mpau 21	^{m}boŋ 35	---
do	A2	nta 21	^{n}di 35	---
bone	D2	nta 35	^{n}dæ 21	ndaŋ 33
language	A2	ntoŋ 21	^{n}doŋ 35	---
body louse	A2	ntoŋ 21	^{n}dʐu 35	ndzʔ 31

Figure 15

The Bigong material provided by Zhang is simply too scanty. But additional data from this location recently reported by Solnit (1999) seem to suggest that this dialect is somewhat close to the Northern varieties. A few unique features observed from the limited data include its spirant reflex of early retroflexed stops and the development of dorsal initials (ŋ-/ŋq-, with tones series 2) from early voiceless labial nasals (Figure 16).

		Northern		Central	Southwestern
		Bigong	Qiaoshang	Wanzi	Laozhai
eye	A1	zew 33	ze 44	tau 33	ti 45
raw	D2	zɛ 11	zĩ 21	te 31	dæ 21
dog	A2	ŋqew 11	ŋqwau 31	mpau 33 (A1)	ɱ 45 (A1)
pig	A2	ŋɔ 11	ŋgʏu 31	mpa 33 (A1)	hv̆ū 45 (A1)
flea	D2	ŋwej 11	ŋqwa 21	mpe 24 (D1)	ɱæ 21 (D1)

Figure 16

On the other hand, there are also certain disagreements between Bigong and other Northern varieties. For instance, Bigong simply has nasal /n-/ for what Qiaoshang and Longli show as the spirant reflex /z-/, which would suggest the early retroflexed nasal (Figure 17). Yet, it still seems advisable to include Bigong as a Northern variety.

	Bigong	Qiaoshang	Longli
thick	neu 33	ze 31	zo 31
bamboo shoot	neu 55	---	zen 53
bird	nu̱ 11	zau 21	zɑu 53

Figure 17

An additional branch called A-Ou was reported by He (1983). A small amount of data on the representative variety of this group at Longjia location (Zhijin county, Guizhou) suggests that it may also belong to our Northern branch. Figure 18 exhibits certain interesting and unique developments in this variety where it shows the voiceless spirantal counterparts of what Longli or Qiaoshang show as voiced spirants. It may also

be worth noting that the Longli Mulao calls themselves /o 53/ or /ɣo 53/, which is probably a related form of the name A-Ou.

	Longjia	Longli	Qiaoshang
fire	fe 33	vɑ 31	pa 44
tree	se 33	zɑ 31	ti 44
eye	sʏu 33	zo 31	ze 44
ax	xei 33	xɑ 31	ɣai 44
road	xeŋ 33	xe 24	ɣen 44

Figure 18

We summarize in Figure 19 our discussions of Gelao subgroupings, in comparison to Zhang's and He's proposals. As we have pointed out from time to time, several varieties which were listed in Zhang (1993) and He (1983) may not include supporting material for us to evaluate. It should thus be emphasized that each branch in different proposals does not necessarily cover exactly the same dialects. The varieties listed in the figure are mainly those we have discussed in this section (those we have not are put in parentheses).

There are no extensive linguistic records of Gelao varieties in Vietnam, though anthropological accounts of the groups which included a small amount of linguistic material have been reported since the beginning of the century (e.g. Bonifacy 1905, Lajonquière 1906). Three kinds of Gelao have been recognized in Vietnamese records: White Gelao (Tu Du), Green Gelao (Ho Ki) and Red Gelao (Voa De) (cf. Nguyen 1972 and Hoang 1994 among others). Concise data on a variety of White Gelao at Ban Ma Che (Ha Giang province) was recently reported by Chang and Edmondson (1994), and there is no doubt that this is a similar variety to that spoken at the Laozhai location in

China. Materials on the other two varieties are very limited and transcriptions uncertain. Still, according to the autonyms used by these groups of people, it is possible that the Green Gelao (Ho Ki) may belong to the Hagei group. And all these varieties most likely belong to the Southwestern branch. (In fact, this appears to be the only Gelao branch whose members have been found outside Guizhou province of China) .

Gelao Branches (Ostapirat 1999)	**Zhang (1993)**	**He (1983)**	**Varieties**
Central	Central	Gao	Wanzi, Dagouchang, Xinzai
Northern	Central, Western, Mulao	Ao	Qiaoshang, Bigong, Longli, Longjia
Southwestern	Southwestern	Duoluo	Laozhai, Niupo, (Moji), (Datiezai), (Jianshan), Dingyinshao, Ban Ma Che
	Western	Ao	Pudi
	North-Central	Hagei	Sanchong, Qinglong

Figure 19

2.7. Lachi varieties

The main Lachi variety represented in this study is spoken at Jinchang location (Maguan county, Yunnan). The speakers of this variety are also known as Flowery Lachi. Other locations in China where the Lachi were allegedly found are Nanlao (Bag Lachi), Renhe and Jiahanqing (Han Lachi), and Xiaobazi (Red Lachi); all in Maguan county (Liang 1990). No linguistic material has ever been reported from these latter varieties, however.

In Vietnam, the Lachi people were reported to live in four locations: Ban May, Ban Pang, Ban Phung and Ban Diu (all in Xin Man county, Ha Giang province). Limited linguistic material (with uncertain transcriptions) were made available on the Ban Phung and Man P'ang (= Ban Pang) variety by Robert (1913). A handful of forms (from unspecific locations) were also found in earlier anthropological accounts of these people (cf. Bonifacy 1906 and Lajonquière 1906). Recently, additional material on the Ban Phung and Ban Diu varieties has been provided by Chang and Edmondson (1994) and Edmondson and Loi (1997), while material on the Ban Pang variety studied by Vietnamese scholars has remained largely unavailable in published form.

We may divide the Lachi languages into three groups according to their reflexes of early voiced stops as respectively breathy, aspirated or voiceless unaspirated stops.[1] These are closely related varieties, in fact, and their separation from each other must have not been very long, especially in comparison with the internal complexity of the Gelao subgroups.

Lachi groups	**Locations**	**Also known as**
Northern	Jinchang	Flowery Lachi
Central	Ban Pang	White Lachi
Southern	Ban Phung	Long-haired Lachi
	Ban Diu	Black Lachi

Figure 20

The Jinchang forms are from our own fieldwork; the Ban Phung and Ban Pang forms are from Edmondson and Loi (1997), except one marked with (r) which is from

Robert (1913). Bonifacy's unspecified variety seems to pattern with the Ban Pang variety in this respect.

	Jinchang	Ban Phung	Ban Pang	(Bonifacy)
shoulder	pfiu B2	phu 31	pu 35	pù 2
navel	tfijo A2	thjɔ 52	---	---
body louse	tfijã A2	tha 31	tie 55	---
tiger	tfije A2	the 33	tie 13	ti
raw	tfijɛ̱ D2S	thɛ 52	---	---
bone	tfijɒ̱ D2S	thɔ 52	tiua 33	---
deer	tfije D2L	the 31	tî (r)	---

Figure 22

2.8. Laha varieties

The Laha languages are only found in Vietnam, mainly in a few villages of Lao Cay and Son La provinces. We may divide the languages into two groups: Northern, represented by the Ta Mit variety in Lao Cai, and Southern, represented by the Nong Lay variety in Son La. The only extensive material on the languages is the report on the latter variety presented by Solntseva and Hoang (1986). On the former variety, limited linguistic data may be found in some early work by Vietnamese scholars (e.g. Dang et al 1972), recently complemented by Gregerson and Edmondson (1997).

Similar to the case of Lachi, a characteristic which defines the Northern and Southern Laha varieties is the distinctive reflexes of early voiced stop initials. The sounds remain voiced in the latter variety but have become voiceless aspirated in the former variety. Forms followed by (v) are gleaned from various unpublished Vietnamese sources. (For 'raw', cf. Laozhai Gelao dæ D2.)

		Nong Lay	Ta Mit	Early Laha
navel	A2	dau 2	thau 33	*d-
body louse	A2	mdal 1 (v)	than 33	*d-
boat	A2	---	tha 33	*d-
thunder	A2	daŋ 2	than 33 -f	*d-
swallow (v.)	C2	dəl 3	ma than 5 (v)	*d-
forget	D2	dap 1	ka thap 5 (v)	*d-
raw	D2	---	k t'óp (v)	*d-
bone	D2	dak 1	thak 32	*d-

Figure 22

Ta Mit, on the other hand, has newly developed modern voiced stops from different sources, including early voiceless nasals (Figure 23) and a velar cluster *kl- (Figure 24). Pubiao forms are also provided for comparison in Figures 23 and 23a.

		Nong Lay	Ta Mit	Pubiao
dog	A1	maa 3	ba 343	ɱaa 42
pig	A1	məu 3	bu 343	ɱuu 42
flea	D1	mat 1 (v)	bat 32	ɱat 33
six	A1	---	dam 343	ɱam 42

Figure 23

Contrast with:

		Nong Lay	Ta Mit	Pubiao
new	A2	maal 2	man 33	---
wet field	A2	naa 2	na 33	nfiee 33
salt	A2	ŋɔɔ 2	ŋɔ 33	ŋfiuu 33
snake	A2	ŋaa 2	ŋa 33	ŋfiɯɑ 33

Figure 23a

		Nong Lay	Ta Mit	Early Laha
grandchild	A1	klaal 3	daan 24	*kl-
grass/leaf	A1	klau 3	dau 343	*kl-
flow	A1	klәi 3	dәi 1 (v)	*kl-
close eye	D1	klap 4	dap 32	*kl-
sun/bright	A1	klaaŋ 3	dang 1 (v)	*kl-

Figure 24

Contrast with:

		Nong Lay	Ta Mit	Early Laha
far	A2	klәi 2	ka33 lɯi 33	*k-l-
star	A2	kluŋ 2	ma33 luŋ 33	*k-l-
child	D2	laak 1	laak 34	*l-

Figure 24a

2.9. Buyang varieties

The Buyang languages are spoken in eight villages of the Gula township, Wenshan prefecture, Yunnan. Among these, the speech used at the Langjia location is considered by the Buyang speakers as most different from the others. Yet, linguistically speaking, the Langjia dialect is still very close to those at the other locations, with differences between them falling mainly in their modern pitch reflexes. Material on the representative variety in this study is collected from the E-Cun location.

Another related language called Yalhong was reported to be spoken in Napo county, Guangxi (Liang 1990, Li 1996). While the language is unmistakably a variety of Buyang, it has adopted a number of phonological innovations to the degree that we may set it up as a subgroup (Southern Buyang) separated from Buyang proper (Northern Buyang).

A few Yalhong innovations include the further devoicing of the fricative z- (> ɬ-), which in turn came from early /r-/ (Figure 25). The main differences between Southern and Northern varieties fall in the area of their rime reflexes, however. Yalhong modern vowel reflexes have wandered greatly from the originals, while those of Buyang proper normally remain relatively unchanged. (Note, for instance, that while the rime *-oo has become Yalhong -aau, the rime -uu has merged with *-ii and become -aai! Cf. Figure 26.) Also velar endings often got lost after long vowels in Yalhong (or, for original stop -k, was at times weakened into -ʔ. Cf. Figure 26a.)

		Yalhong	E-Cun	Pubiao
ear	A2	ɬou 31	ðaa 44	rfiɑɑ 33
bee	A2	ɬaa 53	ðee 44	rfiɑɑi 33
sick	C2	ɬaai 12	ðii 213	rai 45
wet	D2	ɬak 31	ðak 53	rak 45

Figure 25

		Yalhong	E-Cun	Early Buyang
eye	A1	tau 53	taa 24	*-aa
two	A1	θau 53	θaa 24	*-aa
rat	A1	tsaai 53	θii 24	*-ii
short	C2	taai 12	tii 213	*-ii
horn	A1	kaai 53	ʔuu 24	*-uu
three	A1	taai 53	tuu 24	*-uu
neck	A2	ʑaau 31	joo 44	*-oo
salt	A2	ɳ̊aau 31	ɳ̊oo 44	*-oo
body	A2	vaa 31	vaai 44	*-aai
love	B/A1	maa 33	maai 24	*-aai

Figure 26

		Yalhong	E-Cun	Early Buyang
leaf	A1	ʔdja 53	ʔdiaŋ 24	*-iiŋ
tooth	A1	tsuə 53	θɔɔŋ 24	*-uuŋ
water	C1	uə 12	ʔɔɔŋ 42	*-uuŋ
root	A1	tsja 53	ɕaaŋ 54	*-aaŋ
mosquito	A2	ʑiə 31	jaaŋ 44	*-aaŋ
hand	D2L	ɳ̊iə 31	ɳ̊iak 53	*-iik
mad	D2L	pɛɛ 33	paak 53	*-aak
excrement	D1L	iəʔ 53	ʔiak 45	*-iik
dry in sun	D1L	tɛʔ 53	taak 45	*-aak
white	D1L	uəʔ 53	ʔɔɔk 45	*-uuk

Figure 26a

The most interesting feature of Yalhong, however, is its alveolar stop ending /-t/ in a set of words where Buyang and most other Kra languages show alveolar nasal /-n/. We have found that Southern Laha varieties usually have final -l for this set of words, and thus Yalhong -t in such words can be considered as an evidence of its retention of the distinction between early endings *-n and *-l.

		Yalhong	Buyang	Laha
new	A2	maat 31	maan 44	maal 2
fat	A2	nɔt 31	nɛn 44	mnal 1 -t
body louse	A2	ʔdɔt 53	tɛn 44	mdal 1 (v)
slippery	A1	tɔt 31	---	tal 3
deaf[2]	C2	iit 53	ŋan 213	ŋal 3
yellow	C2	ŋaat 31	ŋaan 213	ŋil 3

Figure 27

Contrast with:

		Yalhong	Buyang	Laha	
ten	D1	pɔt 33	put 45	pʏt 23 (Tm)	*-t
tail	D1	tsɔt 31	cut 53	cot 4	*-t
road	A1	qhon 53	hun 24	hon 5	*-n
wind	A2	van 31	vən 44	van 2	*-n

Figure 27a

2.10. Summary.

The Paha and Pubiao languages do not appear to have internal subgroups. Paha is only found spoken in a few villages in Guangnan county of Yunnnan. The Paha speech used in this study is from the Yanglian location.

Likewise, Pubiao communities are found in only a few villages in Malipo county of Yunnan on the Sino-Vietnam border. Just across from that settlement in China, the Pubiao people are reported to live mainly in a few villages of Dong Van, Yen Minh and Meo Vac districts in Vietnam. Recordings of the Pubiao language at Pho La commune, Dong Van district in Vietnam (Hoang and Vu 1992) reveal that it is very much the same variety as that we have collected at Pufeng hamlet of Malipo in China.

Figure 28 summarizes the picture of the Kra languages and varieties we have discussed. Abbreviations are read as follows: n = Northern branch, c = Central branch, s = Southern branch, and sw = Southwestern branch of any given language. Numbers in parentheses refer readers to the list of languages and varieties representing those respective branches which follow the figure.

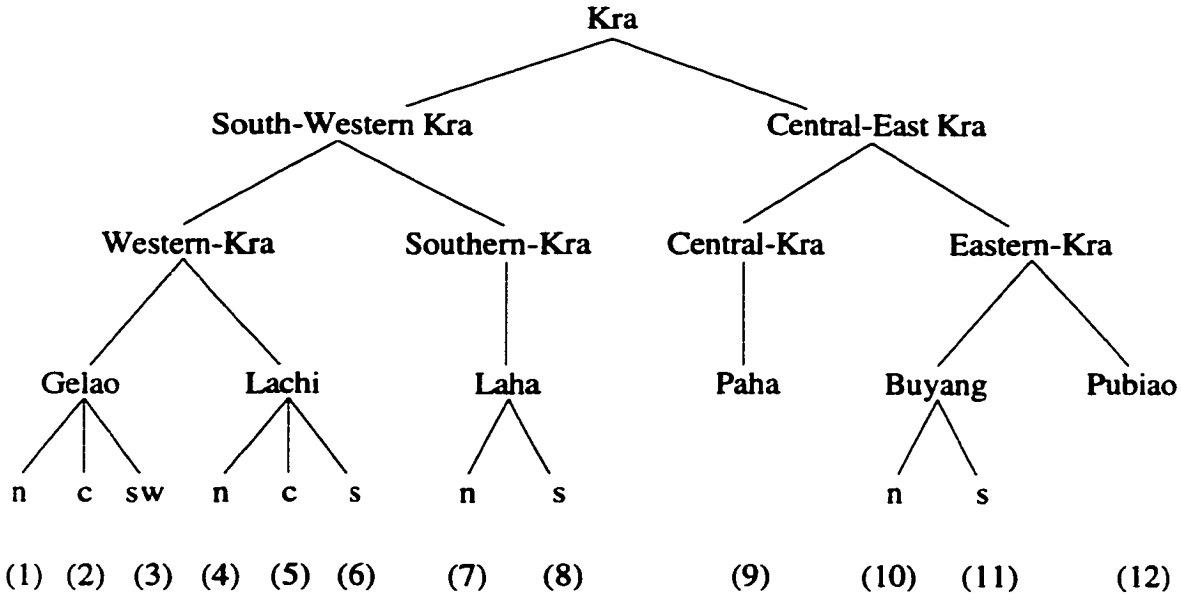
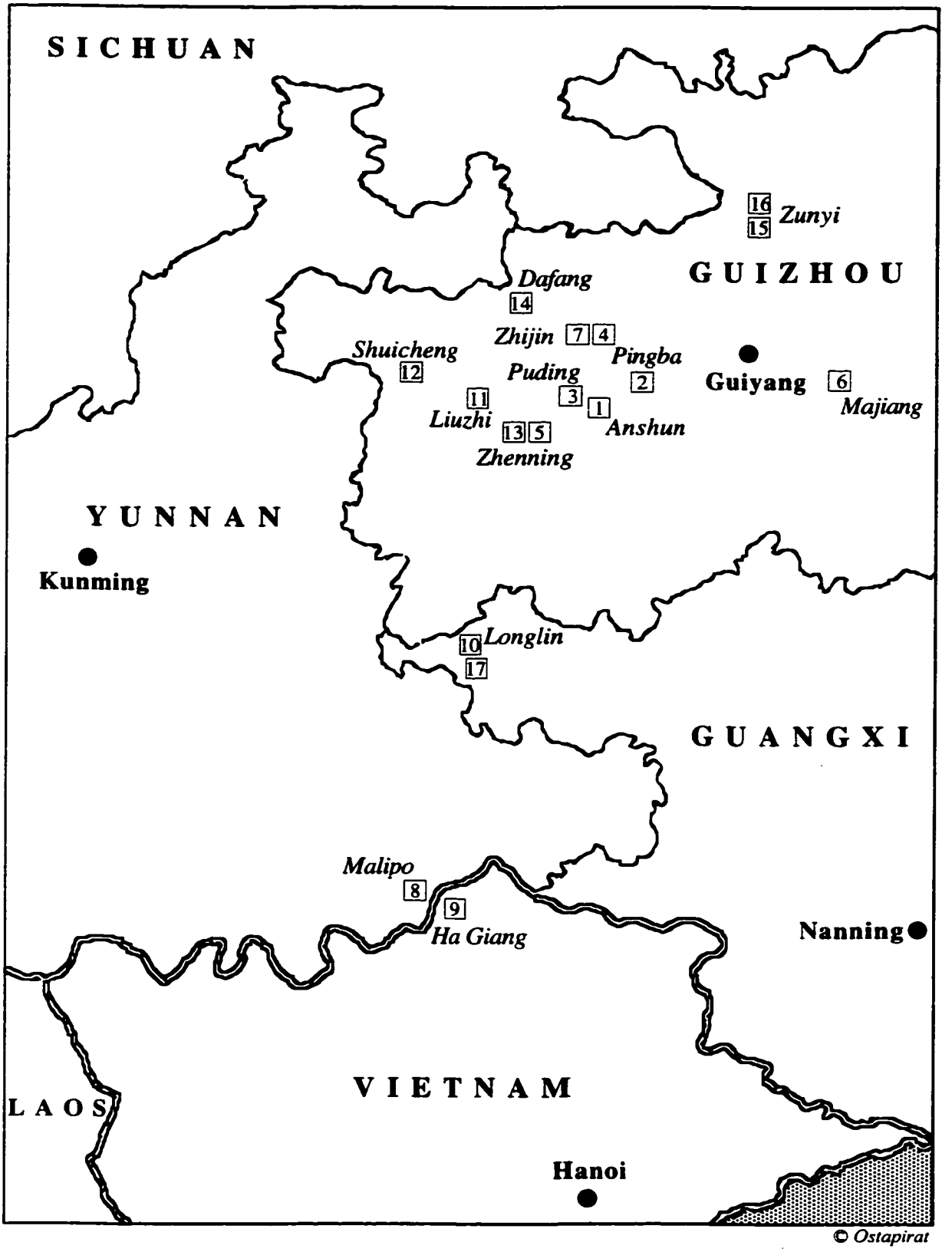


Figure 28

1. Northern Gelao.	Qiaoshang (Zhijin), Longli (Majiang) etc.
2. Central Gelao.	Wanzi (Anshun), Dagouchang (Pingba), etc.
3. Southwestern Gelao.	Laozhai (Malipo), Niupo (Liuzhi), etc.
4. Northern Lachi.	Jinchang (Maguan).
5. Central Lachi.	Man Pang (Ha Giang).
6. Southern Lachi.	Ban Phung, Ban Diu (Ha Giang).
7. Northern Laha.	Ta Mit (Lao Cai).
8. Southern Laha.	Nong Lay, Ban Bung (Son La).
9. Paha.	Yanglian (Guangnan).
10. Northern Buyang.	E-cun, Langjia (Funing), etc.
11. Southern Buyang.	Yalhong (Napo).
12. Pubiao.	Pufeng (Malipo), Pho Bang (Dong Van).

(The varieties whose names underlined are the main representatives in this study).

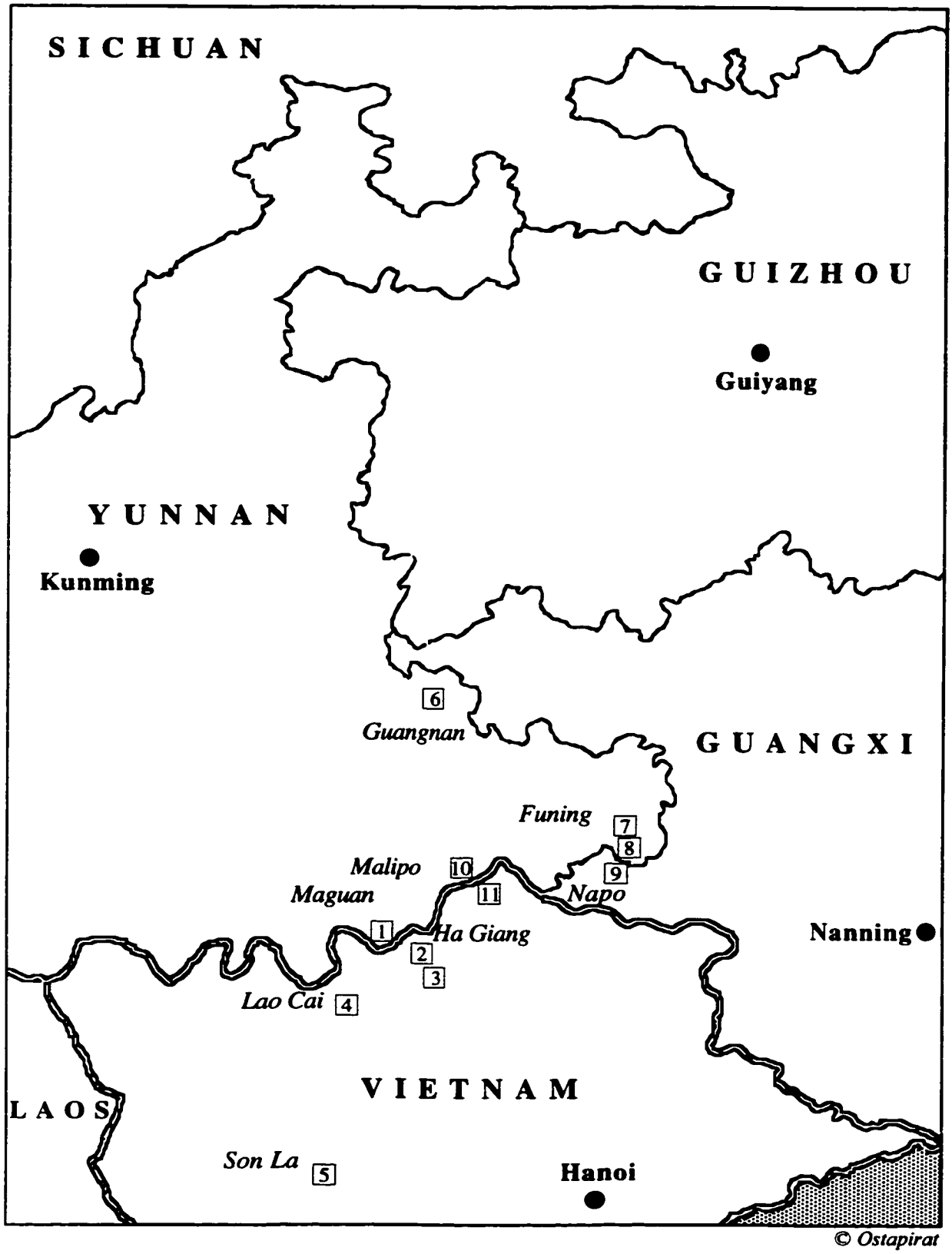


Map 1: Gelao varieties

Legends of Map 1

Branches	Varieties	Locations (Counties, Provinces)
Central	1. Wanzi	Anshun, Guizhou
	2. Dagouchang	Pingba, Guizhou
	3. Xinzai	Puding, Guizhou
Northern	4. Qiaoshang	Zhijin, Guizhou
	5. Bigong	Zhenning, Guizhou
	6. Longli	Majiang, Guizhou
	7. Longjia	Zhijin, Guizhou
Southwestern	8. Laozhai	Malipo, Yunnan
	9. Ban Ma Che	Dong Van, Ha Giang
	10. Moji	Longlin, Guangxi
	11. Niupo	Liuzhi, Guizhou
	12. Datiezai	Shuicheng, Guizhou
	13. Dingyinshao	Zhenning, Guizhou
	14. Pudi	Dafang, Guizhou
	15. Jianshan	Zunyi, Guizhou
	16. Qinglong	Zunyi, Guizhou
	17. Sanchong	Longlin, Guangxi

(All locations are in China, except location 9 which is in Vietnam).



Map 2: Other Kra languages

Legends of Map 2

Languages	Varieties	Locations (Counties, Provinces)
Lachi (n)	1. Jinchang	Maguan, Yunnan
Lachi (c)	2. Ban Pang	Xin Man, Ha Giang
Lachi (s)	3. Ban Phung	Xin Man, Ha Giang
Laha (n)	4. Ta Mit	Than Uyen, Lao Cai
Laha (s)	5. Nong Lay	Thuan Chau, Son La
Paha	6. Yanglian	Guangnan, Yunnan
Buyang (n)	7. E-Cun	Funing, Yunnan
	8. Langjia	Funing, Yunnan
Buyang (s) (Yalhong)	9. Rongtun	Napo, Guangxi
Pubiao	10. Pufeng	Malipo, Yunnan
	11. Pho La	Dong Van, Ha Giang

(Locations 1 and 6-10 are in China. The rest are in Vietnam).

Notes for Chapter 2

[1] Reports on the Jinchang variety by Liang (1990) and Zhang (1993) transcribe our breathy stops as simply voiceless unaspirated stops. Whether or not this may be the case with the records on such varieties as Ban Pang remains unclear.

[2] For another example of Yalhong ŋ- > ø-, note Yalhong /iiə 53/ Buyang /ŋaai 24/ 'maggot'.

CHAPTER 3

KRA-DAI TONES

3.1. Introduction.

All Kra languages are tonal. The number of tones in modern varieties range from three to six, some of which may be accompanied by breathy or creaky phonation types in addition to pitches. These modern tones of the Kra languages are discovered to go back to the same proto system of three-plus-one tones (three in non-checked syllables and one in checked syllables), which could then split in several ways, conditioned by the mutation of initial consonants and by the influence of vowel length in each language and dialect.

Such a tonal system and the mechanisms which underlie its split are found to be similar to what has been established already for Tai and Kam-Sui. It is our purpose in this chapter to offer the background and overall picture of the Kra-Dai tones, and put the Kra tonal system in this comparative context. We are also partly obliged to demonstrate such a connection of tonal systems among the various languages of the Kra-Dai branches in order to justify and substantiate the proposed cognates and correspondences we have presented in the first chapter to bind these languages into the same stock.

It is needless to say, however, that we will not be able to discuss in detail the later innovations or exceptions within a given branch or sub-branch. More emphasis will be put on Kra tones, whose established systems will serve as reference points in the following chapters on the reconstructions of Proto-Kra consonants and vowels.

3.2. The A-B-C tonal classes.

Traditional Thai grammar divides syllables into two types: *Kham Pen* 'live syllables' (syllables ending with a vowel or a nasal); and *Kham Taai* 'dead syllables' (syllables ending with a stop). 'Live syllables' may further belong to one of the three tonal categories: *săaman* 'basic', *?êek* 'primary', or *thoo* 'secondary'. These three tones

were respectively represented in the earliest inscription (13th century) as: no mark, ˈ , and + (the latter two are now written /ˈ/ and /ˇ/ over a vowel). These syllable divisions may be summarized as in Figure 29:

Syllable types	/Kham Pen/ 'live syllables'			/Kham Taai/ 'dead syllables'
Tonal categories	/săaman/ 'basic'	/?êek/ 'primary'	/thoo/ 'secondary'	
Symbols	no mark	ˈ	ˇ	no mark

Figure 29

Similar syllable and tonal structures have long been recognized in traditional Chinese philology. In the earliest Rime Book (7th century), syllables were divided into four tonal categories: *Píng* 'level', *Shăng* 'rising', *Qù* 'departing', and *Rù* 'entering'. The last category only occurs in syllables ending with a stop (equivalent to Thai 'Dead syllables'), thus leaving three categories in syllables ending with a vowel or a nasal (equivalent to Thai 'Live syllables'). Wulff (1934) has noticed that these Chinese tonal categories correspond sytematically with those of Thai, which may be summarized as in Figure 30:

Chinese	Píng	Shǎng	Qù	Rù
Thai	Saaman 'basic'	Thoo 'secondary'	?eek 'primary'	
	'Live Syllables'			'Dead Syllables'

Figure 30

In his *Handbook of Comparative Tai*, Li (1977), following the traditional Thai tone order, assigned symbols A, B, and C for the Proto-Tai tonal categories which correspond to the Thai tones 'basic', 'primary', and 'secondary' respectively. The 'dead syllables' were then assigned as the D tone class, because it is impossible to identify it with any of the other tones which have been set up for the other syllable type (p.25). In historical study of Chinese, these A, B, C, and D symbols have been sometimes used as well, but there the symbols follow the Chinese traditional tone order, i.e. they represent respectively Píng, Shǎng, Qù, and Rù tonal categories. This results in an inverse order of the use of symbols B and C between Chinese and Tai with respect to their corresponding tonal categories.

Chinese	Píng A	Shǎng B	Qù C	Rù D
Thai	Basic A	Secondary C	Primary B	D
	'Live Syllables'			'Dead Syllables'

Figure 31

This three-plus-one system of proto-tones can also be reconstructed for Hmong-Mien languages (cf. Haudricourt 1961, Downer 1963, Chang 1973). For Vietnamese, Haudricourt (1954) has shown that the six Vietnamese tones may be grouped into three classes *ngāng/huyền*, *sắc/nặng*, and *hỏi/ngã*, which correspond to Early Middle Chinese tonal categories Píng, Shăng, and Qù respectively. Thus, in Vietnamese too, the three 'Live Syllable' tonal categories can be assumed. Vietnamese syllables ending with a stop (i.e. the 'Dead Syllables') always belong to the *sắc/nặng* tonal category, so the D tone class has not been separately set up.

3.3. The 1-2 voicing series and the Proto-Tai tone split.

3.3.1. One or more of the Proto-Tai three (plus one) tonal categories have been known to further split in all modern dialects conditioned by voicing or other laryngeal properties of initial consonants such as aspiration and glottalization. As a result, all modern dialects now have more than three tones.

Traditional Thai grammar divides consonants into three classes: High, Mid, and Low. The early Thai grammarians recognized that these three initial classes may influence each of the original three (plus one) tones differently. For example, syllables with the 'basic' (A) tone may be pronounced with either a low rising pitch /24/ or a mid-level pitch /33/ depending on whether they belong to the High or the Mid/Low initial classes respectively. These three consonant classes in traditional Thai grammar are thus sophisticated representations of the groups of initial consonants which share similar phonetic properties with respect to their influence on tonal development.

Traditional series	*Early initials*
High	voiceless fricative and sonorants, aspirated stops
Mid	unaspirated stops, glottalized sounds
Low	voiced sounds

3.3.2. The middle of the 20th century saw a good deal of quality field work done on various Tai dialects, both in Thailand and other countries (see, among others, Brown 1965 for dialects in Thailand; Anonymous 1959 and Li 1940, 1956 for dialects in China and Gedney 1964, 1965, 1970 for dialects in Thailand, Laos, and Vietnam). Comparative material accumulated over the decades has enabled students of Comparative Tai to refine and improve their understanding of the tones and initial classes of Tai languages. For instance, it was found that it is sometimes necessary to further separate the glottalized sounds from the other Mid class initials, since certain dialects develop a special tonal reflex exclusively for syllables with those initials in certain tonal categories (cf. also Li 1943 for discussions on the possible influence of glottalized initial on tones based on a Po-ai dialect). In 'Dead Syllables', it also appears that vowel length may influence the development of the tones. The D tone class thus can be further divided into DS(hort) and DL(ong) depending on whether those checked syllables have short or long vowels respectively. An integrated scheme of this complex interaction between tones and segments in Tai languages, built on the foundation laid by traditional Thai philology, is provided in Figure 32 (this scheme is sometimes known as *Gedney's tone box*, so called after its developer, William Gedney):

Initials at the time of tone splits	Proto-Tai tones				
	A	B	C	DS	DL
1 *aspirated and voiceless fricative sounds					
2 *voiceless unaspirated stops					
3 *glottalized sounds					
4 *voiced sounds					

Figure 32

Figure 33 lists examples of Proto-Tai tones *A and *D and initial classes depicted above to illustrate how the scheme may facilitate the comparative study of Tai dialects. From the figure, we see that Lungchow only splits proto-tones based on the early voicing opposition, and that vowel length does not affect the D tone. The Siamese tonal split in tone A is conditioned by the voiceless fricative and aspirated initials, while the Po-ai split in the same tone is conditioned by glottalized initials. (Tonal splits are indicated for each language by horizontal lines.)

		Siamese	Lungchow	Po-ai	
A					
1	white	khaau 24	khaau 33	haau 24	*x-
1	rain	fon 24	phɯn 33	hun 24	*f-
2	year	pii 33	pii 33	pii 24	*p-
2	eat	kin 33	kin 33	kun 24	*k-
3	fly(n.)	bin 33	bin 33	min 31	*ʔb-
3	take	ʔau 33	ʔau 33	ʔau 31	*ʔ-
4	wet field	naa 33	naa 31	naa 55	*n-
4	thatch grass	khaa 33	kaa 31	haa 55	*ɣ-
DS					
1	heavy	nak 22	nak 55	nak 55	*hn-
1	vegetable	phak 22	phjak 55	pjak 55	*phl/r-
2	fall	tok 22	tuk 55	tɔk 55	*t-
2	duck	pet 22	pit 55	pit 55	*p-
3	raw	dip 22	dip 55	nip 44	*ʔdl/r-
3	chest	ʔok 22	ʔuk 55	ʔak 44	*ʔ-
4	ant	mot 55	mɯt 31	mɔt 44	*m-
4	wash	sak 55	ɬak 31	ɬak 44	*z-

DL

1	taro	phɯak 22	phɯɯk 55	piik 22	*p-
1	carry	haap 22	haap 55	laap 22	*thr-
2	mouth	paak 22	paak 55	paak 22	*p-
2	custard	kaat 22	kaat 55	kaat 22	*k-
3	hot	dɯat 22	dɯɯt 55	naat 22	*ʔd-
3	go out	ʔɔɔk 22	ʔook 55	ʔook 22	*ʔ-
4	root	raak 41	laak 31	laak 31	*dr-
4	rope	čhɯak 41	čɯɯk 31	šaak 31	*ǰ-

Figure 33

3.3.3. The tonal split by loss of a voicing opposition has also operated in other languages of the area, including Chinese, Hmong-Mien, and Vietnamese. The split by aspiration of initials is less widespread, but is also known to occur, for example, in some Hmong-Mien and Karen languages (cf. Haudricourt 1961). The split by glottalized initials is even rarer. There is thus often a tacit agreement among scholars that the tonal split by voicing opposition is most basic and the other kind of splits are somehow more recent or secondary. Li (1977) therefore only refers to Proto-Tai tonal classes as A1, A2, B1, B2, and so on, where the number 2 represents proto voiced initials and the number 1 represents all proto non-voiced initials. Gedney and his students, on the other hand, often refer to proto-tonal classes as A1, A2, A3, A4, and so on. And thus their A2, for instance, does not refer to the early voiced initial class, but to the unaspirated stop initial class (cf. especially Chamberlain 1975 for this practice).

In this study, we will follow Li in designating the basic bipartition of proto-tones as series 1 and series 2. This choice is partly pragmatically motivated, since Li's Proto-Tai has been most widely cited and his practice has already been adopted in the

comparison of Tai and other related languages such as Kam-Sui. When necessary, I will distinguish the three non-voiced initial classes by adding the apostrophe /'/ and raised zero /^{0}/ to the series 1 tones to indicate aspirated and glottalized classes respectively. For example:

Tonal classes	Initial classes
A1'	voiceless fricative or aspirated sounds
A1	unaspirated stops
A1^0	glottalized sounds
A2	voiced sounds

3.4. Kam-Sui tones.

For decades, we have owed our knowledge on the languages of the Kam-Sui group to the work of Li Fang-Kuei, who has published material on the Mak (1948a), Sui (1948b, 1965), and Then (1968) languages. Chinese scholars have worked on various Kam-Sui languages since the 1950s, but most publications only became accessible to the outside world in the 1980s. These include the material on the Kam, Mulam, and Maonan languages, the latter two of which had heretofore been undescribed. Li (1965) suggests that these languages may be divided into two main groups: Kam and Sui, and that Mak, Sui, and Then may belong to the latter group. Thurgood (1988) has added Mulam and Maonan languages into the picture as shown in Figure 34.

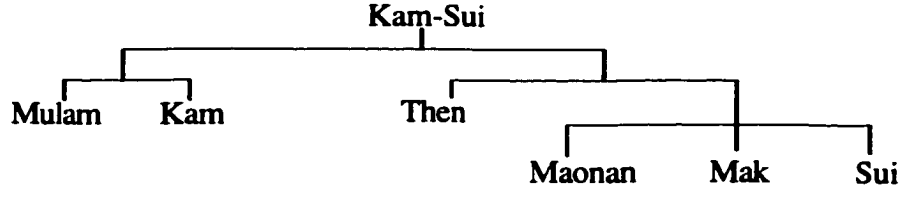


Figure 34

Li (1965) has shown that the tones of the Kam-Sui languages correspond systematically to those of Tai according to the A-B-C tonal classes. Examples of tonal class alternation between these two language groups are marginal; some of them, nevertheless, can serve to distinguish one group from another and thus can be useful for sub-grouping purposes. For example, the words 'pig' and 'rat' both have tone A1 in Tai, but all Kam-Sui languages uniquely show tones B1 and C1 respectively.

Kam-Sui languages, however, differ from Tai in a number of forms with respect to the 1-2 tonal series, indicating that Proto-Kam-Sui initials must differ significantly from Proto-Tai's. This issue will have to be postponed for later discussions on the complex issues concerning proto-initials. The mechanisms involved in Kam-Sui tonal splits are nonetheless the same as in Tai. Sui, Mulam and Then have a basic tonal split based on voicing opposition of initials, while Kam and Mak show an additional tonal split by aspiration (for Mak this only affects tone A). Maonan preglottalized stops agree with voiced initials in taking series 2 tones, but the glottal stop and glottalized nasals take series 1 tones (this fact unfortunately cannot be shown neatly in the chart below. Figure 35 illustrates Kam-Sui tones according to the A-B-C tonal classes; examples of these tonal correspondences are then given in Figure 36.

Tones	Kam	Mulam	Then	Maonan	Sui	Mak
A1'	35	42	13	42	11	13
A1	55	42	13	42	11	24
A2	11	121	35	231	31	31
B1'	453	44	44	44	35	35
B1	53	44	44	44	35	35
B2	33	11	53	213	55	24

C1'	13	53	22	51	44	44
C1	323	53	22	51	44	44
C2	31	24	31	24	52	51
D1S'	35	55	35	55	35	35
D1S	55	55	35	55	35	35
D2S	21	12	31	23	52	31
D1L'	13	42	22	44	35	44
D1L	24	42	22	44	35	44
D2L	31	11	31	24	52	31

Figure 35

3.5. Be tones.

Haudricourt (1965) was the first to make available substantial material on the Be language of Hainan island based on Savina's records. In that monograph, he noted that Be has a basic bipartition of tones and that its four 'live syllable' tones correspond systematically to Tai tones A1, A2, C1, and C2. Two tones in 'dead syllables' also correspond well to Tai tones D1 and D2. For tone B category, Haudricourt cautioned that examples were too few to figure out the correspondence with certainty.

Hashimoto (1980) later published extensive data on a different variety of Be, and that material allows us to see that the B and C tones of Tai have the same reflexes in Be. This fact was also noted by Hansell (1988). (For additional material on Be languages, cf. Zhang 1985).

		Kam	Mulam	Then	Maonan	Sui	Mak
dog	A1'	ŋwa 35	ŋwa 42	maa 13	ma 42	ɱa 11	maa 13
go	A1	paai 55	paai 42	paai 13	paai 42	pai 11	paai 24
yam	A2	man 11	man 121	man 35	man 231	man 31	man 31
new	B1'	məi 453	ɱai 44	mai 44	mai 44	ɱai 35	mai 35
egg	B1	kəi 53	kɣai	kai 44	kai 44	kai 35	tɕai 35
this	B2	naai 33	naai 11	naai 53	naai 213	nai 55	naai 24
liquor	C1'	khwaau 13	khɣaau 53	laau 22	khaau 51	khau 44	laau 44
wear	C1	tan 323	tan 53	tan 22	tan 51	tan 44	tan 44
tree	C2	məi 31	mai 24	mai 31	mai 24	mai 52	mai 51
flea	D1S'	ŋwat 35	ɱat 55	mat 35	mat 55	ɱat 35	mat 35
liver	D1S	tap 55	tap 55	tap 35	tap 55	tap 35	tap 35
ant	D2S	mət 21	mɣət 12	met 31	mət 23	mət 52	mət 31
blood	D1L'	phaat 13	phɣaat 42	---	phjaat 44	phjaat 35	phjaat 44
forehead	D1	pjaak 24	pɣaak 42	paak 22	pjaak 44	pjak 35	pjaak 44
child	D2	laak 31	laak 11	laak 31	laak 24	lak 52	laak 31

Figure 36

Tai tone classes	*Hashimoto's Be (Limkou)*	*Savina's Be*
A1	13	v́
A2	55	v̋
B1	33	v (no mark)
B2	21	v̀
C1	33	v (no mark)
C2	21	v̀
D1	33	ṽ
D2	55	v̩

Figure 37

Examples:

	Be	*Tai*	*Proto-Tai initials*
thick	na 13	naa A1	*hn-
go	ɓoi 13	pai A1	*p-
nose	loŋ 13	daŋ A1	*ʔd-
rice field	nia 55	naa A2	*n-
bark (v.)	sau 33	hau B1	*hr-
low	dom 33	tam B1	*t-
stay	ʒəu 33	juu B1	*ʔj-
soft	num 21	num B2	*n-
face	na 33	naa C1	*hn-
aunt	ɓa 33	paa C1	*p-
obtain	lai 33	dai C1	*ʔd-
water	nam 21	naam C2	*nl/r-

flea	mat 33	mat D1S	*hm-
mouth	ɓak 33	paak D1L	*p-
bird	nok 55	nok D2S	*nl/r-
otter	nak 55	naak D2L	*n-

Figure 38

There are very few forms where Be shows tonal category discrepencies with Tai. A noteworthy example is 'chicken': Be /kai 13/ (= A1), but Tai /kai/ B1. As we shall see later, Hlai and all Kra languages agree with Be in having tone A1 for this etymon. However, like Kam-Sui, Be differs from Tai in a number of forms with respect to the 1-2 series. Some of these words have also tonal series alternation between Southern-Tai dialects on the one hand (tonal series 1), and Northern-Tai dialects on the other (tonal series 2). This alternation is separated by a slash in examples below; for instance, A1/2 means that the word has tone series 1 in Southern-Tai dialects, but tone series 2 in Northern-Tai dialects. In such cases, Be usually agrees with Northern-Tai in having tone series 2. The following examples are not exhaustive:

Be tonal series 2 = Tai tonal series 1

	Be	*Tai*
hair	vun 55	khon A1
year	vəi 55	pii A1
bear	vui 55	mii A1
dream	von 55	fan A1
horn	vau 55	khau A1
bitter	kam 55	khom A1/2
knee	kau 21	khau B1

blow	pau 21	vou B1
excrement	kai 21	khii C1/2
rice	ŋau 21	khaau C1/2
bowl	hui 21	thuai C1/2
fruit	mak 55	maak D1L
gills	ŋak 55	ŋɯak D1L

Be tonal series 1 = Tai tonal series 2

	Be	*Tai*
long	loi 13	rii A2
change	lak 33	lɛɛk D2L
lightning	liap 33	lɛɛp D2L

3.6. Hlai tones.

3.6.1. Ouyang and Zheng (1983) provide the most comprehensive material on nine dialects of Hlai proper. Among these, five dialects have three tones in 'live syllables' plus one tone in 'dead syllables'; thus a similar basic tonal system to that of Proto-Tai may be postulated (see Figure 12 for correspondences of the A-B-C tonal categories between Hlai and Tai). On the other hand, the other four dialects (Yuanmen, Tongshi, Qiandui and Baocheng) show six tones in 'live syllables' plus two tones in 'dead syllables'. The basic 1-2 series tonal split thus may be hypothesized for these latter varieties.

Ouyang and Zheng use numbers 1-8 to represent tones in the glossary. In dialects which split tones, the odd-number tones and even-number tones normally represent series 1 and series 2 of tones respectively (Cf. also Matisoff 1988).

Proto tone classes	Tonal reflexes in Non-split dialects	Tonal reflexes in split dialects
A	1	1
	1	4
B	2	5
	2	2
C	3	3
	3	6

In his proposed system of Proto-Hlai initials, Matisoff (1988) divides initial consonants into three classes: High, Mid, and Low. The four dialects which split tones, Yuanmen, Tongshi, Qiandui and Baocheng, are called criterial dialects. According to him, the Low consonants induced splits in all four criterial dialects; the Mid consonants triggered splits in some, but not all, of the criterial dialects, and the High consonants did not trigger splits in any dialects. The following consonants are those he identifies as Low and Mid consonants:

Low consonants

v			z	ʒ	ɣ	ɣw
	vr	ml		(r)		
mb			ndz	nd	ŋg	

Mid consonants

m			n	ɳ	ŋ	Plain nasals
w	r		l	y		Resonants
hw				hy		Aspirated Resonants

There are certain problems with Matisoff's statements concerning the interaction between consonant classes and tonal splits. Some of his Low consonants did not trigger splits in *all* criterial dialects: /v-/ does not split tones in Baocheng, and /ɦ-, ɣ-, and ɣw-/ do not split tones in Yuanmen.

		Yuanmen	*Tongshi*	*Qiandui*	*Baocheng*
bow	*v-	vat 8	fat 8	vat 8	vat 7
breach/gap	*v-	viaŋ 2	feeŋ 2	veeŋ 2	veeŋ 5
host/master	*v-	viaŋ 4	feeŋ 4	veeŋ 4	veeŋ 1
shoulder	*v-	va 2	fua 2	va 2	va 5
arrange	*ɦ-	khai 1	gai 4	hai 4	hai 4
eight	*ɦ-	khou 1	gou 4	hou 4	hou 4
fat (a.)	*ɦ-	khui 3	guui 6	huui 6	huui 6
sell	*ɦ-	khiu 3	giiu 6	hiu 6	ziiu 6
ask	*ɣ-	kham 1	gaam 4	haam 4	haam 4
gift	*ɣ-	khim 3	giim 6	hiim 6	ziim 6
pullet	*ɣ-	khuui 1	gaai 4	haai 4	haai 4
sparrow hawk	*ɣ-	khen 5	gen 2	hen 2	---
head	*ɣw-	vo 3	go 6	ho 6	hɔ 6
plant (v.)	*ɣw-	va 1	gwa 4	va 4	hwa 4
rotten	*ɣw-	vaau 3	gwaau 6	vaau 6	hwau 6
negative copula	*ɣw-	vai 5	gwai 2	vai 2	hwai 2

It seems that here Matisoff has followed Solnit's (1982) suggestion that in Hlai languages the tonal splits were influenced by nasal (his prenasalized stops) and spirant consonants, and thus he wrongly includes all his reconstructed spirants as Low consonants, despite evidence to the contrary. One may also have the impression that he wants to suggest that consonants which share the same manner (e.g. nasals, resonants, spirants) should have split tones the same way, which unfortunately is not the case. For instance, in addition to the case of the Low consonants mentioned above, he provides the following table summarizing tonal splits in four criterial dialects for his Mid consonants (p.310):

	Yuanmen	Tongshi	Qiandui	Baocheng
Plain Nasals	+	-	+	-
Resonants (w r l y)	+	+	+	-
Aspirated Resonants	+	-	-	-

The summary is somewhat untrue concerning the resonants, since only /w/ and /y/ split tones in the three dialects indicated. Later in the text, it is clear that he in fact recognizes that /l/ only split tones in Yuanmen and Qiandui (and thus should actually belong with his Plain nasals), and that /r/ split tones in all criterial dialects (and thus belongs to his Low consonants). On the other hand, his /v/, which is included as a Low consonant above, should belong here with his /w/ and /y/.

It seems that the attempt to explain Hlai tone splits based on different manners of consonants can be misleading. My opinion is that the tonal split in Hlai is mainly a basic bipartition based on voicing opposition. But each Hlai dialect did not necessarily have the same initial inventory at the time of the tone split, nor is it a given that those inventories were the same as that of the Proto-Hlai stage. In comparative Tai, it is often

the case that we can project back the consonants reconstructible at the time of the tonal split to Proto-Tai. In other words, the Proto-Tai initial inventory must have been very close to the dialectal inventories at the time of their tonal splits. This may not be the case for Hlai, whose tonal splits are likely to be fairly recent. Many Hlai dialects have not split tones at all, while the dialects which split tones are found in the periphery of the Hlai settlement area in the East and the North where there is exposure to Chinese and Be languages (which regularly split tones), and they may be subjected to the influence of these languages.

Let us take the case of Proto-Hlai aspirated resonants *hj- and *hw- as examples. These initials only pattern with Low consonants in Yuanmen, which has nasals /ɳ/ and /ɱ/ as their respective reflexes. The Baisha and Xifang dialects, which I have placed with Yuanmen as the northern-Hlai dialect group, also have nasal reflexes for these proto sounds (cf. Ostapirat 1993). We may thus suggest that at the stage of Proto-Northern Hlai, Proto-Hlai *hj- and *hw- may have already become plain nasals (cf. also Lao, which has the nasal reflex /ɳ-/ for Proto-Tai *hj-), which then induced the series 2 tones in Yuanmen. On the other hand, in other dialects these initials were still voiceless at the time of the tone split, and thus took the series 1 tones. Below, I provide forms with these proto-initials from two Northern-Hlai dialects, Baisha and Yuanmen, and two Central-Hlai dialects, Baoding and Tongshi. The former dialects of each pair in general do not split tones, while the latter two may split tones under the proper conditions.

	Baisha	*Yuanmen*	*Baoding*	*Tongshi*
cogon grass	ɳa 1	ɳa 4	hja 1	za 1
crow (v.)	ɳuaŋ 1	ɳuun 4	hjoon 1	zoon 1
elbow	ɳuŋ 2	ɳuŋ 2	hjuuŋ 2	zuuŋ 5
twig tip	ɳuaŋ 3	ɳuun 6	hjoon 3	zoon 3

crawl	ŋum 1	mom 4	hwuuum 1	huuum 1
hair	ŋoŋ 1	mən 4	hun 1	hun 1
body	ŋuŋ 1	mun 4	huun 1	huun 1
thorn	ŋəŋ 3	mən 6	hwum 3	hum 3

3.6.2. We demonstrate below the regular corresponding A-B-C tonal system between Hlai and Tai, since the systematic correspondences of Proto-Hlai and Proto-Tai tonal categories have not been previously carried out. The representative Hlai dialects are Heitu and Tongshi; the former does not split tones while the latter does (Baoding forms (Bd) may be sometimes cited when related forms in Heitu or Tongshi are lacking). Siamese represents the Tai languages. We will also see that the 1-2 voicing series in these two language groups often do not agree, a fact which demonstrates that their initial consonant inventories differed significantly at the time of the tonal splits.

	Heitu	*Tongshi*	*Tai*
A			
arm	khiin 1	khiin 1	khɛɛn A1
eye	tsha 1	tsha 1	taa A1
gall bladder	dai 1	dai 1	dii A1
body hair	hun 1	hun 1	khon A1
hand	meɯ 1	meɯ 1	mɯɯ A2
leg	---	ha 1	khaa A1
navel	reɯ 1	feɯ 4	dɯɯ A1
nose/face	doŋ 1	daŋ 1	daŋ A1
saliva	laai 1	ɬaai 1	laai A2
skin	naŋ 1	nooŋ 1	naŋ A1
tooth	phen 1	fan 1	fan A2

bitter	ham 1	hoom 1	khom A1/2
far	lai 1	lai 1	klai A1
thick	na 1	na 1	naa A1
bear	mui 1	mui 1	mii A1
dog	ma 1	pa 4	maa A1
fish	da 1	ɬa 1	plaa A1
head louse	tshou 1	fou 1	hau A1
pig	mau 1	pau 4	muu A1
shellfish	tshei 1	tshei 1	hɔɔi A1
bamboo shoots	nɯɯŋ 1	nɯɯŋ 1	naaŋ A2
bran	rom 1	gom 4	ram A2
cogon	ha 1	za 1	khaa A2
ginger	khɯŋ 1	khɯɯŋ 1	khiŋ A1
seed	phen 1	fan 1	fan A2
sesame	ŋeɯ 1	ŋkeɯ 4	ŋaa A2
yam	--	man 1	man A2
fire	pei 1	fei 1	fai A2
gold	khim 1	--	kham A2
house	rɯɯn 1	--	rɯan A2
thunder/crow (v.)	raŋ 1	rooŋ 4	daŋ A1
moon	ɳaan 1	ɳaan 1	dɯan A1
rain	pun 1	fun 1	fon A1
ask	gaam 1	gaam 4	thaam A1
crow (v.)	han 1	zoon 1	khan A1
dream	phen 1	fan 1	fan A1
teach	tuun 1(Bd)	--	sɔɔn A1
walk/go	pei 1	fei 1	pai A1

drum	laŋ 1	laŋ 1	klɔɔŋ A1
road	kuun 1	kuun 1	hon A1
spirit	hwoon 1(Bd)	---	khwan A1
I	hou 1(Bd)	hou 1	kuu A1
we	rou 1	gau 4	rau A2

B

shoulder	va 2	fɯa 2	baa B1
dry	khew 2	khaw 5	khai B1
old	khau 2	--	kau B1
this	nei 2	ni 5	nii B2/C2

C

excrement	hai 3	haai 3	khii C1/2
head	rau 3	go 6	klau C1
intestine	raai 3	raai 6	sai C1
tongue	diin 3	ɬiin 3	lin C2
hot	tshau 3	fou 3 (Bd)	lau C1 (Pa)
near	lew 3	plaw 3	klaw C1
shallow	thun 3 (Bd)	---	tuɯm C1
weep	ŋei 3	ŋai 3	hai C1

D

blood	daat 7	ɬaat 7	luat D2L
bone	ruɯ? 7	fuɯ? 8	duuk D1L
brain	?uuk 7 (Bd)	--	?uk D1S (Pa)
fart	thuut 7	thuut 7	tot D1S

fingernail	liip 7	liip 7	lep D2S
deep	dak 7	ɬoo? 7	luk D2S
raw	riip 7	fiip 8	dip D1S
bird	nook 7 (Bd)	---	nok D2S
flea	mat 7	poot 8	mat D1S
wing	phii? 7	phia? 7	piik D1L
mushroom	dit 9	deɬ 7 (Bd)	het D1S
taro	geek 7(Bd)	---	phuak D1L
bathe	?aap 5	?aap 7	?aap D1L
fall	thok 7	thok 7	tok D1S
pestle	tshaa? 7	tshee? 7	saak D1L
child	laa? 7	ɬee? 7	luuk D2L

Figure 39

3.6.3. There are a few alternations of tonal classes between Hlai and Tai. Note the following examples:

	Heitu	*Tai*	*Hlai-Tai tones*
chicken	khai 1	kai B1	A = B
field	na 2	naa A2	B = A
black	dom 3	dam A1	C = A
beard	muum 3	mum B2 (Pa)	C = B
ash	tou 3	thau B2	C = B
father/male	pha 3 (Bd)	phɔɔ B2	C = B
grandmother	tsau 3 (Bd)	jaa B2	C = B
mother	mei 3	mɛɛ B2	C = B

Note that the last three examples are kinship terms; we shall see later that Kra languages normally agree with Hlai in having tone C for these words. As we have already noted, the word 'chicken' regularly has tone A in Be and the Kra languages.

3.7. Tones in Kra languages.

The tonal system of the Kra languages has not been systematically studied before. The following sections on each of the six languages (Pubiao, Buyang, Gelao, Lachi, Laha and Paha) will thus start with a brief description of tonal inventories in each language, followed by a demonstration of their tonal systems and examples of correspondences among the Kra languages or between them and Tai. The study reveals that these Kra languages also have the same basic A-B-C tonal system as in Tai and the other Kra-Dai languages earlier discussed.

3.8. Pubiao tones.

3.8.1. *Brief descriptions.* Pubiao distinguishes four tones: /42/, /33/, /213/, and /45/. Breathiness (represented by /ɦ/), which is articulated from initials into the vowels, may be found in a number of words with low-falling-rising /213/ and mid-level /33/ tones. In another set of words, the mid-level /33/ pitch is accompanied by glottal closure at the end of the syllable (represented by /ʔ/). Only two tones, /33/ and /45/, may occur in checked syllables.

3.8.2. *The A-B-C tones.* The comparison of Pubiao tones with the tonal categories of Proto-Tai reveals the following systematic correspondences (for examples of these tonal correspondences, see 3.8.5):

Proto-Tai	Pubiao
A	/42/ and /33ɦ/
B	/213/ and /213ɦ/
C	/33ʔ/ and /45/
D	/33/ and /45/

3.8.3. *The 1-2 voicing series.* As can be seen from the tonal correspondences above, each Proto-Tai tone corresponds to two Pubiao tones. Each pair of Pubiao tones reveals its complementary co-occurrence with initials: voiceless and glottalized initials usually occur with one set of tones, while voiced and breathy initials occur with another set of tones. This suggests that there is a basic tonal split based on voicing contrast of the initials which we may set up as the system shown in Figure 40. Examples are provided in Figure 41.

	A	B	C	D
Series 1	42	213	33ʔ	33
Series 2	33ɦ	213ɦ	45	45

Figure 40

		Series 1		*Series 2*
A	dog	ɻaa 42	five	maa 33ɦ
	six	ɻam 42	field	naa 33ɦ
	house	ɻiŋ 42	snake	ŋɯa 33ɦ
	skin	ʔboŋ 42	flower	poŋ 33ɦ
	black	ʔdam 42	we	tuu 33ɦ
	stomach	ɬɔŋ 42	star	luuŋ 33ɦ
	sieve	ɻaŋ 42	bee	raai 33ɦ
	medicine	jaa 42	child	jɯə 33ɦ
B	shoulder	ɻaa 213	cheek/face	mjaa 213ɦ
	head	ɻoo 213	stink	muu 213ɦ
	old	qau 213	earth	luu 213ɦ
	sleep	ʔau 213	swollen	puu 213ɦ

C	horse	ɬee 33ʔ	hawk	laaŋ 45
	blood	qaa 33ʔ	rice	mii 45
	water	ʔɔɔŋ 33ʔ	deaf	ŋan 45
	intestine	θai 33ʔ	sick	rai 45
D	flea	ɲat 33	sock	maat 45
	monkey	ɽɔɔk 33	wet	rak 45
	ten	pɑt 33	hear	tɕak 45
	raw	ʔdap 33	close eye	nap 45
	tail	θɑt 33	bird	nok 45

Figure 41

3.8.4. Pubiao reflexes of tone D are the same as those of tone C. It may be possible to assume that tone /45/ when corresponding to tone C, used to be accompanied by a glottal closure at the end (cf. also Buyang, where its two tones corresponding to the C tone category are both accompanied by similar glottal closure). This glottal closure had the same influence on tone as the stop finals of D class syllables. There are two internal reasons which motivate this assumption. First, we can then suggest that the merger of tone C and D is phonetically motivated, i.e. that both these tone categories once shared the stop closure at the end of syllables. The other reason is that, as we shall see shortly, Pubiao breathiness co-occurs with its reflexes of early voiced initials in tones A2 /33ɦ/ and B2 /213ɦ/, but this feature is not found with its reflexes of tones C2 /45/ and D2 /45/. Then, we may suggest that the breathiness was cancelled out by the abrupt closure at the end of the syllables, a feature shared by tones C and D. Similar interaction and restriction of laryngeal states at the beginning and the end of syllables may be found in Akha (a Loloish language), where aspirated initials only occur with non-checked

syllables and become unaspirated in checked syllables (e.g. *ph- > ph- in non-checked syllables, but *ph- > p- in checked syllables).

3.8.5. Examples of the tonal correspondences between Pubiao and Proto-Tai are provided below (Siamese is used as the representative variety for the Tai language). We can see that while the correspondence of the A-B-C tonal categories between the two languages is mainly regular, Pubiao and Tai disagree in a number of words with respect to the 1-2 tonal series. As in the previous cases of Tai and Kam-Sui or other Kra-Dai languages, such disagreement of tonal series correlates directly with the complex problem of reconstructing the proto-initials of the common language to Tai and other Kra-Dai languages. We will have to defer the issue for later discussions in the proto-initials section.

A = Pubiao /42/

	Pubiao	*Tai*
dog	ɱaa 42	maa A1
pig	ɱuu 42	muu A1
laugh	θaau 42	hua A1
husked rice	θaan 42	saan A1
teach	θuan 42	sɔɔn A1
eye	taa 42	taa A1
die	tjee 42	taai A1
I	kau 42	kuu A1
eat	kən 42	kin A1
hold in mouth	ʔɑm 42	ʔom A1
crow(v.)	ʔdaŋ 42	daŋ A1 'loud; thunder'
black	ʔdam 42	dam A1
medicine	jaa 42	jaa A1

fire	pei 42	fai A2
cogon grass	qaa 42	khaa A2
fishy	qaau 42	khaau A2
buffalo	qaai 42	khwaai A2

A = Pubiao /33fi/

	Pubiao	*Tai*
yam	mən 33fi	man A2
you	mii 33fi	muŋ A2
frost	maɑi 33fi	maai A2
field	nee 33fi	naa A2
ice	nei 33fi	nai A2
bamb shoot	njəŋ 33fi	naaŋ A2
snake	ŋɯɑ 33fi	ŋuu A2
sesame	ŋɯɑ 33fi	ŋaa A2
copper	tjuuŋ 33fi	thɔɔŋ A2
fish	pjɑɑ 33fi	plaa A1
stone/rock	pjɑɑ 33fi	phaa A1
bear	mje 33fi	mii A1
thick	nee 33fi	naa A1
ear	rɑɑ 33fi	huu A1/2

B = Pubiao /213/

	Pubiao	*Tai*
charcoal	thaan 213	thaan B1
old (objects)	qau 213	kau B1
old (people)	qee 213	kɛɛ B1

warm	ʔuɑn 213	ʔun B1
knee	qau 213	khau B1
dry	qɣaa 213	khai B1
shoulder	ɱaa 213	baa B1

C = Pubiao /33ʔ/

	Pubiao	*Tai*
intestine	θai 33ʔ	sai C1
below	tee 33ʔ	taai C1
seedling	kjaa 33ʔ	klaa C1

C = Pubiao /45/

	Pubiao	*Tai*
beard	muum 45	mum C2
buy	θɯɯ 45	sɯɯ C2
sick	rai 45	khai C1

D = Pubiao /33/

	Pubiao	*Tai*
flea	ɱat 33	mat D1
iron	ɬat 33	lek D1
shrink	ɣɑt 33	hot D1
hail	θap 33	hep D1
chase	qxjap 33	khap D1
fart	tɑt 33	tot D1
liver	tjap 33	tap D1
fall	tɔɔk 33	tok D1

raw	ʔdap 33	dip D1
bone	ʔdaak 33	duuk D1
brain	ʔuak 33	ʔuk D1 (Po-ai)

D = Pubiao /45/

	Pubiao	*Tai*
bird	nok 45	nok D2
steal	lak 45	lak D2
lightning	liep 45	lɛp D2
cry out	riak 45	riak D2
dragon	ŋɯak 45	ŋɯak D2
do	wak 45	wiak D2

3.8.6. There are instances of tonal category disagreement between Pubiao and Tai. The first set includes certain etyma where other Kra languages appear to agree with Pubiao in having the same tonal categories in contrast to those of Tai. This may be considered as a shared characteristic of the Kra languages.

	Pubiao	Tai	Pubiao-Tai tones
front/before	quən 42	kɔɔn B1	A1 = B1
chicken	qai 42	kai B1	A1 = B1
chin	qaaŋ 33ʔ	khaaŋ A2	C1 = A2
mother	maai 45	mɛɛ B2	C2 = B2

However, Pubiao alone shows the unexpected tonal category B1 for 'hand' in contrast with tone A2 in other Kra-Dai languages.

hand	m̥ii 213	mɯɯ A2	B1 = A2

The other set of words listed below is likely to consist of Tai loans. These words, though reconstructible for Proto-Tai, are hardly found systematically in Kra languages.

	Pubiao	*Tai*
Pubiao /213/ = Proto-Tai A1		
saddle	ʔaan 213	ʔaan A1
plow	thai 213	thai A1
headwrap	qxan 213	khan A1
onion	huam 213	hɔɔm A1
hair	hwan 213	khon A1
Pubiao /45/ = PT A2		
strength	rjəŋ 45	rɛɛŋ A2
silver	ŋən 45	ŋɯn A2
gold	ɣəm 45	kham A2
sickle	koo 45	khiau A2
Pubiao /33/ = PT B1/B2		
goose	haan 33	haan B1
cut	ʂan 33	han B1
plain	tʃioŋ 33	thuŋ B2

3.9. Buyang tones.

3.9.1. *Brief descriptions.* Buyang possesses six tones: /24/, /44/, /45/, /53/, /42/, and /213/. Tone /42/ is accompanied by a glottal closure at the end, while tone /213/ is accompanied by creakiness, which starts in the middle of the pitch and continues through its rising part. Two tones, /45/ and /53/, may occur with checked syllables.

3.9.2. *The A-B-C tones.* A comparison of Buyang and Pubiao tones reveals the following systematic correspondences:

Proto tone classes	*Pubiao tones*	*Buyang tones*
A1	42	24
A2	33ɦ	44
B1	213	45
B2	213ɦ	53
C1	33ʔ	42ʔ
C2	45	213ʔ
D1	33	45
D2	45	53

3.9.2.1. Buyang reflexes of tone D are identical to those of tone B. Pubiao, however, merges tone D with tone C, a merger which we have suggested may be phonetically motivated by their shared stop closure. Buyang's merging of tone D with tone B reminds us that much is still not understood about the many factors which may be responsible for tonal merger in the languages in this area. (The merger of tone D with either tone C or tone B has been found in many Tai languages.) On the other hand, it should be noted that tone D usually associates itself with either tone B or tone C, and rarely with tone A (but see 3.9.5.5).

3.9.3. *The 1-2 tonal series.* The glottalized initials only occur with series 1 tones (i.e. tones /24/, /45/, and /42/). Other initials may occur with any of the six tones. However, modern voiced sonorant initials which occur with series 1 tones usually correspond to Pubiao voiceless sonorant initials, while those which occur with series 2 tones are voiced in both languages. The basic tonal split by voicing contrast of the initials thus may be assumed for Buyang.

	A	B	C	D
Series 1	24	45	42ʔ	45
Series 2	44	53	213ʔ	53

Figure 42

3.9.4. **Comparison of Buyang and Pubiao forms arranged according to their corresponding tone classes is provided in Figure 43.**

		Buyang	*Pubiao*
pig	A1	muu 24	ɱuu 42
six	A1	nam 24	ɳam 42
stomach	A1	loŋ 24	ɬɔŋ 42
hair	A1	θam 24	θam 42
eye	A1	taa 24	tee 42
horn	A1	qau 24	ʔuu 42
skin	A1	ʔboŋ 24	ʔboŋ 42
pus	B1	muu 45	hau 213
garlic	B1	θoi 45	θei 213
father	B1	paa 45	pee 213
get	B1	tuə 45	tuu 213
ash	B1	tuu 45	tɑu 213
old	B1	qau 45	ʔuu 213
sleep	B1	ʔuu 45	ʔau 213
warm	B1	ʔuən 45	ʔuɑn 213
nose	C1	tiŋ 42ʔ	tɑŋ 33ʔ
wild cat	C1	qau 42ʔ	ʔuu 33ʔ
side	C1	ʔbaaŋ 42ʔ	ʔbaaŋ 33ʔ
orphan	C1	ʔbɔɔŋ 42ʔ	ʔbuoŋ 33ʔ
water	C1	ʔɔɔŋ 42ʔ	ʔɔɔŋ 33ʔ

flea	D1	mat 45	ɱat 33
shrink	D1	ðut 45	ɽɑt 33
deep	D1	lak 45	ɬak 33
liver	D1	tap 45	tjap 33
fart	D1	tut 45	tɑt 33
raw	D1	ʔdip 45	ʔdap 33
tall	A2	vaaŋ 44	kɑɑŋ 33fi
tongue	A2	mee 44	mjee 33fi
five	A2	maa 44	mɑɑ 33fi
yam	A2	man 44	mən 33fi
field	A2	naa 44	nee 33fi
salt	A2	ɳoo 44	ɳũ 33fi
snake	A2	ŋaa 44	ŋɯɑ 33fi
ear	A2	ðaa 44	rɑɑ 33fi
eight	A2	ðuu 44	rɯɯ 33fi
star	A2	lɔɔŋ 44	luuŋ 33fi
above	A2	luu 44	luu 33fi
armpit	A2	lie 44	lii 33fi
mosquito	A2	jaaŋ 44	jaaŋ 33fi
steep	B2	ðaaŋ 53	raaŋ 213fi
charcoal	B2	laa 53	laa 213fi
earth	B2	luu 53	luu 213fi
carry on back	C2	paa 213ʔ	pee 45
sick	C2	ðii 213ʔ	rai 45

hawk	C2	laaŋ 213?	laaŋ 45
inside	C2	lɔŋ 213?	loŋ 45
lick	C2	lɛɛm 213?	liam 45
beard	C2	muəm 213?	muum 45
mother	C2	mii 213?	maai 45
deaf	C2	ŋan 213?	ŋan 45
thorn	C2	ɳaan 213?	ŋɯən 45
rest	C2	jaŋ 213?	jɯŋ 45
wet	D2	ðak 53	rak 45
cloud	D2	mok 53	muak 45
close (eye)	D2	nap 53	nap 45

Figure 43

3.10. Gelao tones.

In this section we will describe the tonal systems of three Gelao varieties: Laozhai, Qiaoshang and Wanzi. These varieties represent three Gelao branches and constitute a main basis for the reconstruction of Proto-Gelao in Chapter 4.

3.10.1. Laozhai variety. The Laozhai variety has four tones: /45/, /35/, /31/, and /33/.

3.10.1.1. *The A-B-C tones.* Laozhai tones correspond to those of Pubiao according to the A-B-C tonal categories as follows:

Tonal Classes	*Laozhai*	*Pubiao*
A1	45	42
A2	35	33ɦ
B1	31	213
B2	31	213ɦ
C1	33	33ʔ
C2	33	45
D1	31	33
D2	31	45

Examples are listed in Figure 44:

		Laozhai	*Pubiao*
cogon	A1	qʏɯ 45	qaa 42
seed	A1	pi 45	pan 42
dog	A1	ɱ 45	ɱaa 42
husked rice	A1	tɕi 45	θaan 42
teach	A1	tʂɻ 45	θuan 42
laugh	A1	so 45	θaau 42
have	A1	ʔo 45	ʔan 42
liquor	A1	plʏu 45	pau 42
ear	A2	ʑi 35	rɑɑ 33ɦ
snake	A2	ŋʏɯ 35	ŋɯɑ 33ɦ
snow	A2	ɳi 35	nei 33ɦ
thick	A2	ni 35	nee 33ɦ
fat	A2	nõ 35	nin 33ɦ
knee	B1	qʏu 31	qau 213
dry	B1	qʏɯ 31	qɣaa 213

old	B1	qʏu 31	qau 213
ash	B1	tʏu 31	tau 213
pus	B1	ɱ 31	hau 213
silver	B1	phrə 31	phjoo 213
smelly	B2	ɱ 31	muu 213ɦ
meat	C1	ʔɑ 33	ʔjau 33ʔ
intestine	C1	ɕi 33	θai 33ʔ
boil(n.)	C1	plɑu 33	pau 33ʔ
water	C1	ʔɱ 33	ʔɔɔŋ 33ʔ
nest	C1	tʂɑ 33	θoo 33ʔ
sick	C2	ʐ̩ı 33	rai 45
deaf	C2	ɳ̊õ 33	ŋan 45
hawk	C2	lu 33	laaŋ 45
thorn	C2	ɳ̊i 33	ŋɯən 45
female	C2	mi 33	mei 45
fart	D1	tæ 31	tɑt 33
liver	D1	tæ 31	tjap 33
fall	D1	ti 31	tɔɔk 33
flea	D1	ɱæ 31	ɱat 33
brain	D1	ʔau 31	ʔwak 33
bird	D2	ni 31	nok 45

Figure 44

3.10.1.2. *The 1-2 tonal series.* Laozhai Gelao only splits tone A, based on voicing opposition of initials: tone /45/ occurs with the voiceless series and tone /35/ occurs with the voiced series. Contrast, for instance, the following forms:

A1 /45/		A2 /35/	
four	pu 45	cave	boŋ 35
tree	ti 45	do	di 35
dog	ɱ 45	hand	mi 35
door	hõ 45	snake	ŋʏɯ 35
ladder	ʔli 45	far	li 35
house	ʔrə 45	fly(n.)	ʐo 35

3.10.1.3. When preceded by another syllable, words with tone /45/ tend to be lowered to [35]. For example, /hɱ 45/ 'dog' may be pronounced in compounds as /ʔla33 hɱ35/. When both syllables of a bisyllabic form have the same original tone /45/, they may both become lowered to [35].

hair	la 31	so 45/35	
ear of grain	la 31	qõ 45/35	
tooth	di 31	pi 45/35	
pillar	di 31	tɕɯ 45/35	
dream	ŋɯ 31	pi 45/35	(ŋɯ 31 = 'sleep')
peach	mɑ 31	plo 45/35	(mɑ 31 = 'fruit')
horn	pa 31	qʏu 45/35	
black	tʂæ 31	ʔlo 45/35	
door	qo 31	hõ 45/35	
chicken	ʔla 33	qei 45/35	
pig	ʔla 33	hʏũ 45/35	
belly	do 35	ɬoŋ 4535	
wait	hʏɯ 45/35	hʏɯ 45/35	(reduplication)
egg	to 45/35	qei 45/35	(egg + chicken)
walk	pi 45/35	ɕõ 45/35	(go/walk + road)

3.10.2. Wanzi and Qiaoshang varieties. The Wanzi variety has six tones: /33/, /44/, /24/, /31/, /55/, and /13/. Syllables with tones /31/ and /13/ are accompanied by breathiness. The Qiaoshang variety also has six tones: /44/, /31/, /24/, /21/, /45/, and /32/. Tones in these varieties correspond to those of Malipo dialect according to the A-B-C tonal classes as follows:

Tonal classes	*Laozhai*	*Wanzi*	*Qiaoshang*
A1	45	33	44
A2	35	44	31
B1	31	24	24
B2	31	31ɦ	21
C1	33	55	45
C2	33	13ɦ	32
D1	31	24	24
D2	31	31ɦ	21

Figure 45

3.10.3. All three Gelao varieties have the same tonal reflexes of tones D and B. Wanzi breathiness occurs with the series 2 tones (B2, C2, and D2), indicating that it arose from early voiced initials. In tone A2, this breathiness became aspiration of stop initials. (The following change may be assumed: *b- etc. > pɦ- and then pɦ- > ph- in tone A.)

		Laozhai	*Wanzi*	*Qiaoshang*
cave	A2	boŋ 35	phu 44	poŋ 31
father	A2	ba 35	phɒ 44	pɒ 31
do	A2	di 35	tha 44	tʏu 31
louse	A2	dʐu 35	tshen 44	tʂø 31

brother	B2	ʑu 31	tsəɯ 13fi	so 21
count	C2	dau 33	ta 31fi	tʏu 33
chopstick	C2	dzɑu 33	tsəɯ 31fi	tso 33
tear(n.)	C2	ʑi 33	tsau 31fi	se 33
bone	D2	dæ 31	taŋ 13fi	tɒ 21
fall	D2	dʏu 31	ta 13fi	tʏu 21

Figure 46

Examples of syllables with the series 1 tones are illustrated below:

		Laozhai	*Wanzai*	*Qiaoshang*
four	A1	pu 45	pu 33	pau 44
tree	A1	ti 45	tai 33	ti 44
get	B1	po 31	pɒ 24	pø 24
ash	B1	tʏu 31	ta 24	tʏu 24
plant (v.)	C1	to 33	tan 55	tø 45
excrement	C1	qæ 33	qɒ 55	qai 45
blood	D1	plɑ 31	plɒ 24	ple 24
close (eye)	D1	ʔlæ 31	kle 24	kwa 24

Figure 47

3.11. Lachi tones.

3.11.1. *Brief description.* Jinchang Lachi has six tones: /55/, /35/, /45/, /24/, /33/, and /21/. The two lower rising tones /35/ and /24/ are frequently accompanied by breathiness. This feature is also found with a number of words with tones /33/ and /21/.

A number of syllables with tone /33/ and tone /21/ may also have a glottal closure at the end (which usually constricts the vowels. This is shown as v̲ below). These complex features of Lachi tones may be illustrated as follows:

pitch	*breathiness*	*glottal constriction*
55	ø	ø
45	ø	ø
33	ø	v̲
21	ø	v̲
21	ɦ	v̲
33	ɦ	v̲
24	ɦ	ø
35	ɦ	ø

3.11.2. *The A-B-C tones.* Lachi tones correspond to the Gelao tones according to early tonal classes as follows:

Tone classes	*Lachi*	*Gelao (Wanzi)*
A1	55	33
A2	35ɦ	44
B1	45	24
B2	24ɦ	31
C1	3̲3̲	55
C2	3̲3̲ɦ	13
D1	2̲1̲, 45	24
D2	2̲1̲ɦ, 24ɦ	31

For examples of correspondences of tone D, see 3.11.3; for tone series 2, see 3.11.4; and for tone series 1, see 3.11.7.

3.11.3. *Early short and long checked syllables.* Lachi variant reflexes of the D tones are conditioned by vowel length. Tone /21/ is the reflex of early syllables with short vowels (DS); the glottal constriction which usually occurs with this tone can be assumed to be a residue of the early stop endings (this constriction was often obscured by the strong breathiness accompanying the stop initials in D2S syllables). The two DL tones /45/ and /24fi/ do not show glottal constriction, a fact which suggests that original stop endings were lost early after long vowels. The reflexes of syllables with DL tones merge with those of the B tones.

Buyang forms are provided for comparison below, since this language has a vowel length distinction and still keeps stop endings intact. Laha (Lh) forms are sometimes cited when corresponding Buyang forms are lacking (Laha tones 4 and 1 are the normal reflexes of D1 and D2 tonal classes respectively; see 3.12). Forms from Gelao (Wanzi) are provided in the last column to illustrate the tonal correspondences between Lachi and Gelao as summarized above, and especially to confirm the proper 1-2 tonal series when Buyang differs from Lachi in this respect. Laozhai Gelao (Lz) forms fill in some gaps when corresponding forms in the Wanzi variety are lacking.

		Lachi	*Buyang*	*Gelao (Wz)*
ten	D1S	pɛ̱ 21	put 45	pe 24
fart	D1S	tɛ̱ 21	tut 45	tæ 31 (Lz)
fall	D1S	tjo̱ 21	tuk 45	tau 24
liver	D1S	tja̱ 21	tap 45	tæ 31 (Lz)
tail	D1S	sɛ̱ 21	cut 53 (D2)	tshan 24
fingernail	D1S	lɛ̱ 21	lip 53 (D2)	kle 24

blood	D1L	pjo 45	plaat 4 (Lh)	plɒ 24
duck	D1L	ko 45	ʔaap 45	---
handspan	D1L	ko 45	kaap 45	xɒ 24
soil	D1L	ʔo 45	ʔɔɔt 45	---
white	D1L	ʔi 45	ʔɔɔk 45	ʔau 31 (Lz)
bone	D2S	tjɒ̰ 21fi	dak 1 (Lh)	taŋ 31fi
raw	D2S	tjɛ̰ 21fi	ʔdip 45 (D1)	te 31fi
forget	D2S	tja̰ 21fi	ʔdap 45 (D1)	te 31fi
deep	D2S	ljɒ̰ 21fi	lak 45 (D1)	laŋ 31fi
carry	D2L	pi 24fi	pjaak 53	---
fruit	D2L	mī 24fi	maak 45 (D1)	mei 31fi
cry	D2L	n̰o 24fi	n̰iet 45 (D1)	---
take	D2L	zi 24fi	haak 1 (Ph)	---

Figure 48

3.11.4. *Breathiness.* Breathiness is only found in the reflexes of the series 2 tones, suggesting that it originated from the early voicing of initials (this feature is especially strong with stop initials). Examples below illustrate the tonal correspondences between Gelao (Wanzi) and Lachi as summarized above. Forms from other Gelao varieties are provided when related forms in the Wanzi variety are lacking; these are marked by either (Lz) or (Qs) which indicate respectively Laozhai or Qiaoshang varieties.

		Lachi	*Gelao (Wz)*
crow (v.)	A2	tjɔ̃ 35fi	thaŋ 44
do	A2	tje 35fi	tha 44

navel	A2	tjo 35fi	zo 31 (Qs)
louse	A2	tjã 35fi	tshen 44
yam	A2	ma 35fi	mbø 31 (Qs)
tongue	A2	ɲjo 35fi	mlõ 35 (Lz)
fat	A2	ɲja 35fi	nan A2
ear	A2	lu 35fi	zau 44
shoulder	B2	pu 24fi	py 21 (Qs)
y brother	B2	ʑo 24fi	tsəɯ 31fi
love	B2	mɒ 24fi	ŋɒ 31fi
sleep	B2	ɳi 24fi	ŋka 31fi
smelly	B2	mi 24fi	mpa 31fi
tear (n.)	C2	ɳũ 33fi	tsau 13fi
deaf	C2	ɳa 33fi	ŋan 13fi
bamboo shoot	C2	ni 33fi	ntəɯ 13fi
thorn	C2	ŋo 33fi	ɳu 13fi
wear	C2	ljo 33fi	lai 13fi
grandmother	C2	ʑu 33fi	ʑɒ 13fi
female	C2	mja 33fi	mɒ 13fi
steal	C2	lĩ 33fi	len 13fi
bone	D2S	tjɒ̱ 21fi	taŋ 31fi
deep	D2S	ljɒ̱ 21fi	laŋ 31fi
raw	D2S	tje̱ 21fi	te 31fi
fruit	D2L	mĩ 24fi	mei 31fi

Figure 49

3.11.5. *Glottal constriction.* In addition to its appearing with DS syllables as a residue of early stop endings, the glottal constriction is also found with tone C syllables (cf. Pubiao and Buyang for this similar feature in tone C). This constriction is sometimes obscured by (early) aspirated or fricative initials.

		Lachi	Gelao (Wz)	Laha (Nl)
excrement	C1	kạ 33	qɒ 55	kai 6
water	C1	ʔi̱ 33	ʔəɯ 55	ʔuŋ 6
plant (v.)	C1	tjã̱ 33	tan 55	tam 6

3.11.6. *Tonal changes.* In addition to the normal reflexes above, there are certain words which show tone /45/ with breathiness. Such words are usually preceded by the prefix /ʔa-/. Thus, for example, we have the following trio, where the tone of the second word ('tiger') in Lachi shifts from its original /35/ to /45/ but still possesses the breathy trace of the A2 tone class ('do'), in contrast with the non-breathy reflex of B1 syllables ('ash'):

	'do' /A2/	*'tiger' /A2/*	*'ash' /B1/*
Lachi	tje 35fi	ʔa tje 45fi	tje 45
Gelao (Laozhai)	di 35	di 35	tʏu 31
Gelao (Wanzi)	tha 44	(qa 55)	ta 24

There also appears to be the following tonal change, where tone /55/ becomes /45/ when preceded by syllables with tone /33/:

		Lachi	*Gelao (Wz)*	*Pubiao*
tree	A1	m̩33 tje45	tai 33	tai 42
I	A1	la33 ki45	(ʔi 33)	kau 42

3.11.7. **Examples of correspondences of tones A1, B1, and C1 between Lachi and** Gelao (Wanzi) **are here provided:**

		Lachi	*Gelao (Wz)*
dream	A1	pã 55	pan 33
four	A1	pu 55	pu 33
fire	A1	pje 55	pai 33
egg	A1	tã 55	tan 33
eye	A1	tju 55	tau 33
teach	A1	tɕe 55	səɯ 33
pillar	A1	tɕi 55	sa 33
leg	A1	ku 55	qau 33
bitter	A1	kã 55	qan 33
heavy	A1	kjã 55	xen 33
horn	A1	kwɛ 55	qa 33
chicken	A1	kɛ 55	qai 33
two	A1	su 55	su 33
dry	B1	ku 45	xau 24
old	B1	kwɛ 45	qa 24
sated	B1	sɛ 45	tshai 24
bran	B1	pu 45	pau 24
ash	B1	tje 45	ta 24
excrement	C1	kạ 33	qɒ 55
meat	C1	ʔọ 33	ʔɒ 55
wild cat	C1	kwɛ̰ 33	qa 55

water	C1	ʔi̯ 33	ʔəɯ 55
ask	C1	tɕi̯ 33	sai 55
plant (v.)	C1	tjā̤ 33	tan 55

3.12. Laha tones.

3.12.1. *Brief description.* The Laha language (Nong Lay variety) has six tones, represented by the numbers 1 to 6. Their phonetic pitches are approximated from the descriptions given in Solntseva and Hoang (1986) as follows:

Phonemic tones	1	2	3	4	5	6
Approximate pitches	55	55ʔ	53	33	32	24

3.12.2. *The A-B-C tones.* Laha often shows competition between two or more tones corresponding to each Proto-Tai tonal class. The complications are most likely due to the many loans from neighboring Tai dialect(s) spoken by the more numerous and dominating Tai population living in the same area. The current geographic settlement of Laha is found farther south than the other Kra languages, and may perhaps mark the southernmost point where these languages are spoken. Since Laha and Tai belong to the same language family, sorting out loans from native words is not an easy task.

To clarify the picture of the basic tonal system of Laha, we propose to consider first the sets of vocabulary items which Laha does not share with Tai. This will prevent the possibility of contamination by recent Tai loans The comparisons of these lexical items with Buyang and Pubiao, whose tonal systems have already been demonstrated, reveals systematic correspondences according to the A-B-C tonal classes as follows:

Tone classes	*Laha*	*Buyang*	*Pubiao*
A1	3, 5	24	42
A2	2	44	33ɦ
B1	4	45	213
B2	1	53	213ɦ
C1	6	42?	33?
C2	3	213?	45
D1	4	45	33
D2	1	53	45

3.12.2.1. Laha shows two reflexes of tone A1: tone 3 and tone 5. The latter only occurs with aspirated and fricative initials, the former elsewhere. Like Buyang (E-Cun) and Gelao dialects (but unlike Pubiao), tone D merges with tone B. Examples of Laha reflexes of the A-B-C tonal classes in selected non-Tai vocabulary are provided below. Lachi (Lc) or Wanzi Gelao (Gl) forms may be sometimes cited when no related forms are found in either Buyang or Pubiao.

		Laha	*Buyang*	*Pubiao*
laugh	A1'	sɔɔ 5	θoo 24	θaau 42
husband	A1'	sɛɛ 5	θee 24	cje 42
two	A1'	saa 5	θaa 24	cee 42
know	A1'	sɔɔ 5	sa 33 (Gl)	cu 55 (Lc)
die	A1'	phən 5	pen 33 (Gl)	phī 55 (Lc)
stomach	A1'	loŋ 5	loŋ 24	ɬɔŋ 42
tooth	A1	cuŋ 3	θɔɔŋ 24	θuaŋ 42
skin	A1	taa 3	---	tu 55 (Lc)
good	A1	ʔai 3	---	ʔai 42

buy	A1	col 3	sen 33 (Gl)	tɕī 55 (Lc)
have	A1	ʔan 3	ʔan 24	ʔan 31
liquor	A1	pəu 3	pa 33 (Gl)	pau 42
three	A1	təu 3	tuu 24	tau 42
sunlight	A1	klaaŋ 3	klei 33 (Gl)	ɬaaŋ 42
egg	A1	tam 3	tam 24	tā 55 (Lc)
tree	A1	təi 3	tai 44 (Gl)	tai 42
star	A2	kluŋ 2	lɔɔŋ 44	luuŋ 33fi
wind	A2	van 2	vən 44	ven 44 (Gl)
afraid	A2	blaa 2	laa 44	lau 44 (Gl)
tendon	A2	van 2	ven 44 (Gl)	vṍ 35fi (Lc)
cow	A2	nəi 2	ntai 44 (Gl)	---
do	A2	dəu 2	ʔduu 24 A1	tje 35fi (Lc)
return	A2	dɔŋ 2	ʔdɔɔŋ 24 A1	---
gibbon	A2	mjuu 2	luu 44	---
neck	A2	juu 2	jo 44	---
new	A2	maal 2	maan 44	mu 44 (Gl)
salt	A2	ɳɔɔ 2	ɳoo 44	ɳũ 33fi
wing	A2	vaa 2	vu 44 (Gl)	lu 35fi (Lc)
tongue	A2	maa 2	mee 44	mje 33fi
sated	B1	cii 4	θi 45	sɛ 45 (Lc)
ripe	B1	ɳəu 4	muu 45	ɳi 45 (Lc)
many	B1	ʔəi 4	ʔai 24 (Gl)	---
bite	B1	tai 4	---	tja 45 (Lc)
sleep	B1	ʔou 4	ʔuu 45	ʔau 213

bran	B1	paa 4	faa 45	pu 45 (Lc)
bark (v.)	B1	plau 4	plɒ 24 (Gl)	---
stink	B2	məu 1	mpa 31fi (Gl)	muu 213fi
y brother	B2	jau 1	juə 53	zo 24fi (Lc)
d-in-law	B2	mləi 1	lai 31fi (Gl)	---
flesh	C1	ʔəu 6	ʔuə 42ʔ	ʔjau 33ʔ
armpit	C1	tai 6	--	tjạ 33 (Lc)
rat	C1	lai 6	lɒ 55 (Gl)	lia 33 (Lc)
iron	C1	kɛl 6	tɕin 55 (Gl)	kẹi̯ 33 (Lc)
water	C1	ʔuŋ 6	ʔɔɔŋ 42ʔ	ʔɔɔŋ 33ʔ
plant	C1	tam 6	tam 42ʔ	---
one	C1	cam 6	tɕã 33ʔ (Lc)	tɕjaa 33ʔ
heart	C1	lul 6	ləɯ 55 (Gl)	lie 33 (Lc)
inside	C1	kluŋ 6	kləɯ 55 (Gl)	---
ask	C1	cəi 6	sai 55 (Gl)	tɕi̯ 33 (Lc)
deaf	C2	ŋal 3	ŋan 213ʔ	ŋan 45
yellow	C2	ŋil 3	ŋaan 213ʔ	ŋ̍in 45
goat	C2	mɛɛ 3	---	mọ 33fi (Lc)
hawk	C2	klaaŋ 3	laaŋ 213ʔ	laaŋ 45
go	C2	vaa 3	vaa 213ʔ	vụ 33fi (Lc)
wear	C2	lɛɛ 3	lee 213ʔ	ljọ 33fi (Lc)
rice(cooked)	C2	mlaa 3	mpəɯ 13fi (Gl)	mii 45
white	D1	ʔuk 4	ʔɔɔk 45	ʔi 45 (Lc)
monkey	D1	hok 4	khọ 21 (Lc)	ɽɔɔk 33

tail	D1	cot 4	cut 53 D2	sɑt 33
full	D1	tik 4	tiak 45	tek 33
foot	D1	kok 4	qa 24 (Gl)	kǫ 21 (Lc)
give	D2	nak 1	naak 53	ni 31fi (Gl)
hear	D2	jak 1	jǫ 21fi (Lc)	tcak 45
forget	D2	dap 1	ʔdap 45 D1	ʔdjap 33
itchy	D2	dok 1	ʔduk 45 D1	tau 31fi (Gl)

Figure 50

(Recall that Buyang and Pubiao on the one hand, and Gelao and Lachi on the other, normally differ in terms of the 1-2 tonal series in lexical items where the former group has reflexes of preglottalized stop initials (ʔd- etc) while the latter has reflexes of voiced stop initials. Laha agrees with the Gelao-Lachi group in this respect).

3.12.3. The majority of Tai-related vocabulary items also fit the above A-B-C tonal scheme, although, like other Kra languages, Laha differs from Tai in a number of forms with respect to the 1-2 series. Examples of comparisons between Laha and Tai are provided below. These probably include a number of early Tai loans which were integrated into Laha early enough to have developed like native words.

		Laha	Tai
A	hair	sam 5	phom A1
	belly	loŋ 5	loŋ A2 (Ks)
	cooked rice	saal 5	saan A1
	road	hon 5	hon A1

garden	sun 5	suan A1
pond	nɔɔŋ 5	nɔɔŋ A1
sun/day	van 5	wan A2/1
sky	thɛn 5	thɛɛn A1
fragrant	hɔm 5	hɔɔm A1
ginger	khiŋ 5	khiŋ A1
jar	hai 5	hai A1
sheet clf.	phɯn 5	phɯɯn A1
yawn	hɔɔ 5	haau A1
of	khɔŋ 5	khɔɔŋ A1
fire	pəi 3	fai A2
eye	taa 3	taa A1
door	təu 3	tuu A1
cucumber	tiŋ 3	tɛɛŋ A1
louse	tou 3	hau A1
snail	cii 3	hɔɔi A1
leg	kaa 3	khaa A1
horn	kou 3	khau A1
bitter	kam 3	khom A1/2
pig	məu 3	muu A1
dog	maa 3	maa A1
spur	dɯə 3	dɯaj A1
rattan	kwɛɛ 3	waai A1
grandson	klaal 3	laan A1
expensive	phɛŋ 2	phɛɛŋ A2

even	phiŋ 2	phiaŋ A2
copper	thoŋ 2	thɔɔŋ A2
lead (n.)	sɯn 2	chin A2
person	khon 2	khon A2
ear	khlaa 2	huu A1
gold	kham 2	kham A2
cogon grass	khaa 2	khaa A2
kill	phən 2	fan A2
fish	blaa 2	plaa A1
navel	dau 2	dɯɯ A1
moon	daan 2	dɯan A1
thunder	daŋ 2	daŋ A1
boat	daa 2	rɯa A2
hand	maa 2	mɯɯ A2
come	maa 2	maa A2/1
bear	mɛɛ 2	mii A1
city	mɯŋ 2	mɯaŋ A2
rice field	naa 2	naa A2
thick	naa 2	naa A1
snake	ŋaa 2	ŋuu A2
far	klәi 2	klai A1
fall	kloŋ 2	loŋ A2
deer	kwaaŋ 2	kwaaŋ A1
flowery	laai 2	laai A2
swim	lɔj 2	lɔɔi A2
rain	jal 2	fon A1
sell	vәj 2	khaai A1/2

B	dry	khaa 4	khai B1 (Lao)
	old	kou 4	kau B1
	goose	haan 4	haan B1
	charcoal	thaan 4	thaan B1
	ash	thəu 4	thau B2
	loom	kii 4	kii B1
	shake	sal 4	san B1
	bark(v.)	plau 4	hau B1
	split	phaa 4	phaa B1
	release	plɔi 4	plɔɔi B1
	from	tɛɛ 4	tɛɛ B1
	shoulder	baa 1	baa B1
	onion	buu 1	bua B1
	field	thoŋ 1	thuŋ B2
	tired	mɯ(ə)i 1	mɯaj B2
C	heel	son 6	son C1
	intestine	sii 6	sai C1
	excrement	kai 6	khii C1
	male	pau 6	phuu C1/2
	bee	phləŋ 6	phɯŋ C1
	smooth	kliŋ 6	kliaŋ C1
	thick (soup)	khon 6	khon C1
	cloud	phaa 6	faa C1
	cave	tham 6	tham C1
	cotton	phaai 6	faai C1
	plank	pɛn 6	pɛɛn C1

	knife	phlaa 6	phraa C2
	crossbow	naa 6	naa C1
	trousers	soŋ 6	sooŋ C1 (Lao)
	insane	baa 6	baa C1
	rise	khɯn 6	khɯn C1
	enter	khau 6	khau C1
	embrace	ʔum 6	ʔum C1
	valley	lɔŋ 3	lɔɔŋ C2
	rib	khlaaŋ 3	khaaŋ C1
	hammer	kɔn 3	khɔɔn C2
D	beard	nut 4	nuat D1
	blood	plaat 4	lɯat D2
	liver	tap 4	tap D1
	lung	pɔt 4	pɔɔt D1
	male	thɯk 4	thɯk D1/2
	tail	cot 4	sut D1
	fingernail	klɔp 4	lep D2
	catfish	-duk 4	duk D1
	frog	khwit 4	khiat D1
	leech	taak 4	thaak D2
	moth	mut 4	mɔɔt D2
	deep	lak 4	lɯk D2
	spicy	pat 4	phet D1
	carry	haap 4	haap D1
	pestle	caak 4	saak D1
	lance	hɔɔk 4	hɔɔk D1

hat	muək 4	muak D1
bamboo hat	klop 4	kuup D1
sheaf	plɔk 4	plɔɔk D1
sing	khap 4	khap D1
blind	bɔt 4	bɔɔt D1
go out	ʔɔk 4	ʔɔɔk D1
fall down	tok 4	tok D1
answer	tɔp 4	tɔɔp D1
child	laak 1	luuk D2
gum	huɯk 1	nuɯak D1
chest	ʔək 1	ʔok D1
bone	dak 1	duuk D1
bird	nok 1	nok D2
toad	khlok 1	khrok D2
ant	mot 1	mot D2
dark	muɯt 1	muɯɯt D2
curve	khot 1	khot D2
lightning	laap 1	lɛɛp D2
fog	muk 1	mɔɔk D1
taro	haak 1	phuɯak D1
fruit	maak 1	maak D1
squash	bɔp 1	buap D1
mat	phuk 1	fuuk D2
slip	phlaat 1	phlaat D2
like	mak 1	mak D2
grow	ŋɔk 1	ŋɔɔk D2

tie	mat 1	mat D2
tear	cik 1	chiik D1
pluck	bət 1	bit D1
drag	klaak 1	laak D2
fold	thop 1	thop D2
count	nap 1	nap D2
exchange	lɛk 1	lɛɛk D2

Figure 51

3.12.4. Having set up the normative Laha tonal system, we may now suggest that the following vocabulary items whose tonal reflexes deviate from the scheme are possibly Tai loans. Most of these words do not have regular corresponding forms in the other Kra languages, a fact which further supports the presumption that they are more recently integrated into the language.

4 = A1

	Laha	*Tai*
waist	ʔɛw 4	ʔeu A1
coxcomb	hɔn 4	ŋɔɔn A1
thin	baaŋ 4	baaŋ A1
ditch	muŋ 4	muaŋ A1
dam	phaai 4	faai A1
foot	tin 4	tiin A1
bridge	khuu 4	khua A1
steel	khaaŋ 4	khaaŋ A1 (Lao)
sound	siŋ 4	siaŋ A1

eggplant	khɯɯ 4	khɯa A1/2
lid	phaa 4	faa A1
plow	thai 4	thai A1
bag	thoŋ 4	thuŋ A1
ring	vɛn 4	wɛɛn A1
sink	com 4	com A1
dive	dam 4	dam A1
lean	ʔiŋ 4	ʔiŋ A1
hang	khwɛn 4	khwɛɛn A1

4 = C1

	Laha	*Tai*
face/before	naa 4	naa C1
wide	kwaaŋ 4	kwaaŋ C1/B1
pot	mɔɔ 4	mɔɔ C1
swim/cross	khaam 4	khaam C1
carry	hiw 4	hiu C1
untie	kii 4	kɛɛ C1

5 = B1

	Laha	*Tai*
muddy	khun 5	khun B1
grey	mun 5	mon B1
big	ɳəɯ 5	jai B1
young	num 5	num B1
sow	vaan 5	waan B1

5 = C1

	Laha	*Tai*
gourd	tau 5	tau C1/B1
grass	ɳaa 5	jaa C1/A1

1 = C1

	Laha	*Tai*
throw	kwaaŋ 1	khwaaŋ C1
flood	thum 1	thuam C1

4 = A2

	Laha	*Tai*
cat	mɛu 4	mɛɛw A2
frost	mɯj 4	məi A2 (White Tai)
stand	jɯn 4	jɯɯm A2

1 = A2

	Laha	*Tai*
hate	saŋ 1	chaŋ A2
lift	ɳɔɔ 1	jɔɔ A2
grope	cam 1	khlam A2
carry on shoulder	khɔn 1	khɔɔn A2
salty	khəm 1	khem A2
steep	san 1	chan A2
round	mon 1	mon A2
long	jaau 1	jaaw A2
peacock	juŋ 1	juuŋ A2

mud	phoŋ 1	phoŋ A2
smoke	khwan 1	khwan A2
fan	vəi 1	wii A2
pole	khaan 1	khaan A2

1 = C2

	Laha	*Tai*
morning	sau 1	chaau C2
lazy	khlaan 1	khlaan C2
bad	haai 1	raai C2
drought	lɛŋ 1	lɛɛŋ C2

3.13. Paha tones.

3.13.1. *Brief description.* Paha has five tones /33, 31, 44, 21(3) and 45/. Breathiness may be found with voiced initials in all but /31/ tones. The rising part of tone /213/ is especially prominent in citation, otherwise it is often audible as /21/. Only the last two tones occur with checked syllables.

3.13.2. *The A-B-C tones.* The Paha tones correspond to those of Buyang according to the Kra-Dai tonal categories as follows:

Proto-tone classes	Paha tones	Buyang tones
A1	33	24
A2	31	44
B1	44	45
B2	21(3)	53
C1	45	42?
C2	21(3)	213?
D1	44	45
D2	21	53

3.13.3. *The 1-2 voicing series.* In native words, initials with tone series 2 are exclusively sonorants. These sonorants are usually breathy in syllables with tone /21(3)/, which is the Paha reflex of proto tones B2, C2, and D2. With tone /31/, the reflex of proto tone A2, they remain plain sonorants.

Breathiness is also found in a number of syllables with tone series 1 and with both obstruent and sonorant initials. Comparative evidence suggests that the breathiness in this category has developed from early voiceless fricative or aspirated sounds, which is rightly reflexed by tone series 1.

3.13.4. Examples of comparison between Paha and Buyang forms according to their tonal correspondences are provided in Figure 52:

		Paha	*Buyang*
A1	leg	ɣaa 33	ʔaa 24
	tooth	jɔɔŋ 33	θɔɔŋ 24
	bitter	qam 33	ʔam 24
	good	ʔaai 33	ʔai 31 (Pb)
	heavy	qan 33	han 24
	chicken	qai 33	ʔai 24
	egg	ðam 33	tam 24
	cogon	qaa 33	ʔaa 24
	seed	pii 33	pee 24
	fire	pui 33	fii 24
	sun/day	vhan 33	vən 24
	two	θaa 33	θaa 24
	three	tuu 33	tuu 24
	four	paa 33	paa 24
	buy	tɕɛn 33	tɕī 55 (Lc)

	do	duu 33	ʔduu 24
	dream	van 33	pan 24
	have	ʔan 33	ʔan 24
	laugh	ðhɯɯ 33	θoo 24
	pillar	dʒhuu 33	θuu 24
	pillow	ɳhii 33	ɳee 55
A2	fat	nan 31	nɛn 44
	new	maan 31	maan 44
	bee	ðii 31	rɑɑi 33fi (Pb)
	mosquito	jaaŋ 31	jaaŋ 44
	snake	ŋaa 31	ŋaa 44
	wing	vaa 31	vu 33 (Wz)
	behind	lan 31	len 35 (Lz)
	salt	ɳɯɯ 31	ɳoo 44
B1	pus	ŋfiuu 44	muu 45
	dry	gfiaa 44	haa 45
	old	quu 44	ʔuu 45
	bran	bɣaa 44	faa 45
	father	paa 44	paa 45
	bite	ðaai 44	tja 45 (Lc)
	ash	duu 44	tuu 45
B2	rotten	ðhuŋ 21(3)	zuŋ 13fi (Wz)
	smelly	mhuu 21(3)	muu 213fi (Pb)
	sleep	ŋhuu 21(3)	ŋka 13fi (Wz)

C1	chin/jaw	qaaŋ 45	ʔaaŋ 42ʔ
	heart	lhin 45	lɒ 55 (Wz)
	light (a.)	ghaa 45	xau 55 (Wz)
	wild cat	quu 45	ʔuu 42ʔ
	water	ʔɔɔŋ 45	ʔɔɔŋ 42ʔ
	plant (v.)	tam 45	tam 42ʔ
C2	goat	mfiii 21(3)	mǫ 33fi (Lc)
	grandmother	jfiaa 21(3)	jaa 21ʔ
	steal	lfiam 21(3)	luəm 21ʔ
	sick	ðfiii 21(3)	ðii 21ʔ
	mother	mfiai 21(3)	mii 21ʔ
	male-in-law	jfiuu 21(3)	jau 45 (Pb)
D1	chest	tak 45	tak 45
	fart	ðat 45	tut 45
	foot	kɔɔk 45	kǫ 21 (Lc)
	liver	tap 45	tap 45
	nose	ŋfiat 45	ŋ̩tce 24 (Wz)
	deep	lhak 45	lak 45
	itchy	dɔɔk 45	ʔduk 45
	crow	ʔaak 45	ʔi 24 (Wz)
	ten	vat 45	put 45
	bathe	ʔaap 45	ʔɒ 24 (Wz)
	fall	tɔɔk 45	tuk 45
	forget	dap 45	ʔdap 45

D2	hair	mfiɯt 21	mɛ 21fi (Lc)
	bird	nfiook 21	nok 1 (Lh)
	crab	ðfiaat 21	khlaat 1 (Lh)
	cloud	mfiook 21	muok 53
	child	lfiaak 21	laak 1 (Lh)
	weep	ɳfiit 21	ɳit 1 (Lh)
	give	nfiaak 21	naak 53
	take	ðfiaak 21	haak 1 (Lh)
	hear	jfiak 21	jak 1 (Lh)

Figure 52

3.14. Summary of Kra-Dai tonal correspondences.

This study shows that the early tonal system of Kra-Dai languages consists of three tones in syllables ending with a resonant or a vowel, plus one tone in syllables ending with a stop. This system, which we may call the A-B-C tonal system, shows excellent corerespondences across the Kra-Dai languages (with marginal exceptions). We may thus suggest that this A-B-C tonal system is reconstructible for Proto-Kra-Dai.

The split of these proto tones, basically conditioned by different laryngeal states of initials (namely voicing, aspiration, and glottalization), has operated extensively in most Kra-Dai languages. But there are also a number of languages which have not split tones at all (e.g. some dialects of Hlai). The tonal split is thus a more recent development than the initial differentiation of Proto-Kra-Dai, which each branch of the Kra-Dai languages or sometimes each variety of a subgroup may have adopted at different periods of time. This time differential, combined with the fact that at the time of tonal split in each language the initial inventories may have already become quite different from language to language, is responsible for the often alternating tonal series found among

the daughter languages. Such tonal alternations, however, can be very useful for reconstructing the early stage of proto-initials. The detailed comparison of Proto-Kra-Dai initials, however, has to be left for future studies.

A summary of the tonal correspondences across the Kra-Dai languages discussed in this chapter is given in Figure 53. The abbreviations in parentheses following some language names indicate particular varieties as follows:

Gelao (Lz)	=	Laozhai Gelao
Gelao (Qs)	=	Qiaoshang Gelao
Gelao (Wz)	=	Wanzi Gelao
Lachi	=	Jinchang Lachi
Laha (Nl)	=	Nong Lay Laha
Laha (Tm)	=	Ta Mit Laha
Paha	=	Yanglian Paha
Buyang (Ec)	=	E-Cun Buyang
Buyang (Lj)	=	Langjia Buyang
Yalhong	=	Yalhong
Pubiao	=	Pufeng Pubiao
Hlai (1)	=	Hlai dialects which do not split tones
Hlai (2)	=	Hlai dialects which split tones
Be	=	Limkou Be (Hashimoto 1980)
Kam-Sui	=	Proto-Kam-Sui
Tai	=	Proto-Tai

Of these, Laha (Tm), Buyang (Lj), and Yalhong tonal systems have not been discussed in the previous sections. The summary of their systems are included in Figure 53 as reference, since we have sometimes cited forms from these varieties, especially

when forms in the main representative dialects are lacking. With certain exceptions, their tonal reflexes appear to fit in our established A-B-C tonal system as summarized here. Nevertheless, we have to caution that data on these languages are somewhat limited, and are not from our own records. In Laha (Tm), transcriptions of checked syllable tones are unfortunately so ambiguous that a systematic analysis could not be carried out. For example, the source (Gregerson and Edmondson 1997) has provided the following forms: 'bone' /thak 32/ (p.261) but /thak 34/ (p.262); 'liver' /tap 32/ (p.261) but /tap 23/ (p.262).

Proto-Tones	A1'	A1	A1⁰	A2	B1'	B1	B1⁰	B2	C1'	C1	C1⁰	C2	D1S	D1L	D2S	D2L
Gelao (Lz)	45			35	31				33				31			
Gelao (Qs)	44			31	24			21	45			32	24		21	
Gelao (Wz)	33			44	24			31fi	55			13fi	24		31fi	
Lachi	55			35fi	45			24fi	33			33fi	21	45	21fi	24
Laha (Nl)	5	3		2	4			1	6			3	4		1	
Laha (Tm)	343			33	24				212	31		21				
Paha	33			31	44			21(3)	45			21(3)	44		21	
Buyang (Ec)	24			44	45			53	42?			213?	45		53	
Buyang (Lj)	54		31	312	11				24			11	54	11		
Yalhong	53			31	33			12	33			12	33	53	31	
Pubiao	42			33fi	213			213fi	33?			45	33		45	
Hlai (1)	1				2				3				7			
Hlai (2)	1			4	5			2	3			6	7		8	
Be	13			55	33			21	33			21	33		55	
Kam-Sui	A1			A2	B1			B2	C1			C2	D1		D2	
Tai	A1			A2	B1			B2	C1			C2	D1		D2	

Figure 53

CHAPTER 4

PROTO GELAO

In this chapter we will discuss the reconstruction of Proto-Gelao (PG), based mainly on three representative dialects. Laozhai variety represents the Southwestern branch (Swg), Qiaoshang the Northern branch (Ng) and Wanzi the Central branch (Cg). PG onsets will be discussed first (4.1) followed by PG rimes (4.2).

4.1. Proto-Gelao initials

For ease of discussion, PG initials will be divided into five groups and presented according to their similar phonetic manners in the following order: stops (4.1.1), sibilants (4.1.2), sonorants (4.1.3), retroflexes (4.1.4) and spirants (4.1.5). Discussions of complex onsets will follow in section 4.1.6.

Some notes may be provided after each set of the reconstructed sounds. These are in general intended to give additional forms from other dialects when relevant, especially when the corresponding forms in the representative varieties are lacking. The numbers in the notes refer to the respective numbers of etyma which precede them.

4.1.1. Stops

4.1.1.1. Voiceless stops **p-, *t-, *k-, *ʔ-*

The reflexes of PG voiceless stop consonants are straightforward and can be reconstructed without difficulty. PG *k- is reflexed as post-velar in several dialects, including all three varieties here, but k- is also found (e.g. in Shanbeihou variety, Zhang 1993). Words with these initials have series 1 of tones, indicating their voicelessness in origin.

	Proto-Gelao		Laozhai	Qiaoshang	Wanzi
1. four	*p-	A1	pu	pau	pu
2. fire	*p-	A1	---	pa	pai
3. seed	*p-	A1	pi	pa	---
4. male	*p-	C1	pɑu	po	---
5. three	*t-	A1	tʏu	tʏu	ta
6. ash	*t-	B1	tʏu	tʏu	ta
7. plant (v.)	*t-	C1	to	tø	tan
8. fall (v.)	*t-	D1	ti	tau	tau
9. chicken	*k-	A1	qɪ	qai	qai
10. old	*k-	B1	qʏu	qʏu	qa
11. expensive	*k-	B1	qʏɯ	qe	qau
12. excrement	*k-	C1	qæ	qai	qɒ
13. ascend	*ʔ-	A1	ʔi	ʔa	ʔai
14. have	*ʔ-	A1	ʔo	ʔø	ʔan
15. water	*ʔ-	C1	ʔm̩	ʔau	ʔəɯ
16. brain	*ʔ-	D1	ʔau	--	ʔu

Notes

2. For Swg, cf. Moji /pi^{31}/.

16. For Ng, cf. Majiang /ʔu^{55}/.

*4.1.1.2. Voiced stops *b-, *d-, *g-*

PG voiced stops are kept as voiced in Laozhai. In Qiaoshang, they are regularly devoiced into unaspirated voiceless stops, while in Wanzi these sounds become voiceless aspirated in tone A. Words with these initials all have series 2 of tones.

	Proto-Gelao		Laozhai	Qiaoshnag	Wanzi
1. cave	*b-	A2	boŋ	poŋ	phu
2. father	*b-	A2	bɑ	pɒ	phɒ
3. well	*b-	B2	bo	pau	pəɯ
4. do	*d-	A2	di	tʏu	tha
5. fall	*d-	B2	dʏu	tʏu	ta
6. count	*d-	C2	dau	tʏu	ta
7. measure	*g-	B2	---	kã	kaŋ

4.1.2. Sibilants

*4.1.2.1. Voiceless sibilants *s-, *ʃ-, *ts-, *tʃ-, *c-*

No dialect has kept all distinctions of these proto-sounds. Laozhai and Qiaoshang have normally separated fricatives from affricates, while merging alveolar and prepalatal sounds (i.e. *s- = *ʃ- (#1-2 and #5-6) and *ts- = *tʃ- (#3-4 and #7-8)). Wanzi, on the other hand, has kept the distinction between alveolar and prepalatal articulations, but lost contrast between original fricatives and affricates. The palatal *c- has later brought back modern Wanzi affricate ts-. In Qiaoshang, it has merged early with the other two fricatives to become s-.

	Proto-Gelao		Laozhai	Qiaoshang	Wanzi
1. hair	*s-	A1	so	sø	san
2. laugh	*s-	A1	so	sau	sa
3. buy	*ts-	A1	tsen	tsen	sen
4. ask	*ts-	C1	--	tse	sai
5. dry (v.)	*ʃ-	A1	--	sʏu	tsha
6. rope	*ʃ-	D1	sɑ	sɒ	tshei

7. satiated	*tʃ-	B1	tsʅ	tsei	tshai
8. tail	*tʃ-	D1	tsæ	tsen	tshan
9. paddy	*c-	A1	tɕi	se	tsau
10. descend	*c-	C1	---	so	tsɯ

Notes

10. For Swg, cf. Niupo /tsei^{31}/.

*4.1.2.2. Voiced sibilants *z-, *ʒ, *dz-, *dʒ-, *ɟ-*

All dialects have kept voiced alveolar fricative (*z-) and affricate (*dz-) apart. For pre-palatal sounds, Wanzi again has merged fricative (*ʒ-) and affricate (*dʒ-) together, while Qiaoshang has merged the latter (*dʒ-) with palatal (*ɟ-) instead.

These are the voiced counterparts of those in the preceding set. Words with these initials all show series 2 of tones.

	Proto-Gelao		Laozhai	Qiaoshang	Wanzi
1. play	*z-	A2	zʅ	sɒ	zəɯ
2. field	*z-	A2	---	se	zəɯ
3. borrow	*dz-	A2	---	tsø	tshu A1!
4. chopsticks	*dz-	C2	dzɑu	tso	tsəɯ
5. younger brother	*ʒ-	B2	zu	so	tsəɯ
6. tear (n.)	*ʒ-	C2	zi	se	tsau
7. mosquito	*dʒ-	A2	---	zi	tɕhi
8. son-in-law	*dʒ-	C2	---	zʏu	tsa
9. grandmother	*ɟ-	C2	zɑ	zɒ	zɒ

Notes

2. Both Laozhai and Niupo (Swg varieties) use another word: /bo C2/ and /bɑŋ^{55}/ respectively.

7. For Swg, cf. Niupo /ʑu^{55}/.

4.1.3. Sonorants

*4.1.3.1. Voiced nasals and liquid *m-, *n-, *ɳ-, *ŋ-, *l-*

Voiced nasals have usually become Qiaoshang prenasalized stops; velar nasal (*ŋ-) at times became postvelar (ɴʁ-) before back vowels (#12-13). Wanzi shows variable reflexes as either plain nasals or prenasalized stops. It is unclear whether these variants might point to an early distinction or are simply due to dialect mixture. Even closely related varieties (such as Wanzi and Dagouchang) do not always agree in this respect. For instance, for #10 'thorn', the Dagouchang form has been recorded as /ɳtɕu^{21}/. We will temporarily put them together here until new evidence suggests otherwise.

For the liquid, all varieties have a straightforward reflex l-.

	Proto-Gelao		Laozhai	Qiaoshang	Wanzi
1. hand	*m-	A2	mi	mbe	mpau
2. smelly	*m-	B2	m̩	mbu	mpa
3. rice	*m-	C2	mɑu	mbo	mpəɯ
4. rain	*m-	A2	men	mben	mei
5. female	*m-	C2	mi	mbi	mɒ
6. cow	*n-	A2	ɳi	ɳdzi	ntai
7. this	*n-	B2	ni	ɳdzi	ni
8. horse	*ɳ-	C2	ɳi	ɳdze	ɳtɕau
9. salt	*ɳ-	A2	ɳu	---	ɳtɕəɯ
10. thorn	*ɳ-	C2	ɳi	ɳdzai	ɳu

11. snake	*ŋ-	A2	ŋʏɯ	ŋge	ŋkau
12. sleep	*ŋ-	B2	ŋɯ	NʁʏU	ŋka
13. deaf	*ŋ-	C2	ŋ̊ō	Nʁā	ŋan
14. steal	*l-	C2	lā	len	len
15. deep	*l-	D2	ʑi	lɒ	laŋ

Notes

8. For Ng, see Majiang /ŋ̊ə^{31}/.

12, 14. Laozhai palatal reflexes are secondary. A palatal glide is assumed to have been added between the initials and the following short vowel -a- (#13 has rime *-an, and #15 *-ak), i.e. *ŋan > ŋjan > ŋ̊an > ŋ̊ō (#13) and *lak > ljak > jak > ji (#15). For another Swg form for #15, cf. Niupo /lei^{35}/.

*4.1.3.2. Voiceless nasals and liquid *hm-, hn-, *hn̥-, *hŋ-, *hl-*

The voiceless nasals have been kept in Laozhai. This dialect interestingly shows two variants, the voiceless labial nasal m̥- and the nasalized glottal fricative h̃-, for both early labial and velar sounds (*hm- and *hŋ-). For *hm-, the regular reflex is m̥-, but the nasal is dropped before high back vowel *-u (through rounding dissimilation, #2) and left as the nasalization of the glottal fricative. For *hŋ-, on the other hand, the regular reflex is nasalized glottal fricative h̃-, but the sound has become labial, also, before the high back vowel *-u (i.e. *hŋu > hmu > m̥-, #6 and #7).

In Wanzi, voiceless nasals have usually become prenasalized stops, except in one case (#4, cf. notes). Qiaoshang has a special development for *hm-, showing prenasalized velar (or postvelar before -w-) reflexes (#1-3). It also appears from the tonal reflex that the initials of these words have become voiced, probably *ŋw-, at the time of tone split in this variety (-w- was lost before *-u in #2; when it is kept, it has

caused the preceding initial to become postvelar). Extra-Kra evidence, namely in some Kam-Sui languages, reveals that all these roots have a velar pre-initial, which has similarly caused the labial initial to become velar. For instance, the root 'dog' shows the following forms in Sui, Mulam and Lakkja languages respectively: ɱa A1, ŋwa A1 and khwõ A1, all supposed to go back to *x-ma. The development in Qiaoshang thus may be such that the nasal initial has left its labial articulation in the form of medial -w- while exposing its nasality to the velar pre-initial (*xm- > *xᵑw > *ʱŋw-).

Voiceless lateral *ɬ- has been kept in Laozhai and Qiaoshang. (It has become palatalized to ɕ- before high vowels in the former). Wanzi shows plain l-, but with tone series 1 which indicates its voiceless origin.

	Proto-Gelao		Laozhai	Qiaoshang	Wanzi
1. dog	*hm-	A1	ɱ	ŋqwau A2	mpau
2. pig	*hm-	A1	hɤ̃ũ	ŋgʏu A2	mpa
3. flea	*hm-	D1	ɱæ	ŋqwa A2	mpe
4. six	*hn-	A1	---	ndø A2	nan
5. nose	*hɳ-	D1	---	ɳdzɒ	ɳtɕe
6. ripe	*hŋ-	B1	ɱ	ŋgʏu	ŋka
7. pus	*hŋ-	B1	ɱ	---	ŋka
8. wait	*hŋ-	A1	hɤ̃ũ	ŋge	ŋkau
9. door	*hŋ-	A1	hõ	ŋgau	ŋka
10. stomach	*hl-	A1	ɬoŋ	---	luŋ
11. rat	*hl-	A1	ɕi	ɬi	lɒ
12. heart	*hl-	C1	ɕu	ɬɒ	ləɯ

Notes

4. This is the only form in this series where Wanzi shows a plain nasal reflex. Perhaps, this is pointing to *ʔn-, whose glottalized feature may be assumed to have dropped early in Qiaoshang and merged with *n- before tonal splits (and thus tone series 2) in this latter variety. For a similar development, cf. #5 under 4.1.4.2, where *ʔɳ- may be noted.

5. For Swg, cf. Niupo /ŋɛ^{35}/, perhaps pointing to *hŋj- (cf. 4.1.6.3, #46).

10. For Ng, cf. Majiang /luŋ^{24}/. This dialect does not show voiceless lateral as its reflex for this proto sound.

4.1.4. Retroflexes

*4.1.4.1. Retroflexed obstruents *ʈ-, *ɖ-, *tʂ-, *dʐ-*

These sounds in general show the same reflexes as those of the respective stops (*t- and *d-) and affricates (*ts- and *dz-) in Wanzi. The similar merger of retroflexed (*ʈ- and *ɖ-) into alveolar stops (*t- and *d-) also occurred in Laozhai, but the retroflexed affricates (*tʂ- and *dʐ-) have remained retroflexes and are distinct from their alveolar counterparts. But the retroflexed series is reflected mainly in Qiaoshang, whose distinctive spirant reflex (z-) has motivated setting up this separate series of PG retroflexes.

	Proto-Gelao		Laozhai	Qiaoshang	Wanzi
1. eye	*ʈ-	A1	ti	ze	tau
2. egg	*ʈ-	A1	to	zø	tan
3. dry in sun	*ʈ-	D1	---	zɒ	tei
4. crow (v.)	*ɖ-	A2	dõ	zã	thaŋ
5. raw	*ɖ-	D2	dæ	zĩ	te
6. teach	*tʂ-	A1	tʂʅ	zɒ	səɯ
7. pillar	*tʂ-	A1	tɕɯ	zɪ	sa

8. mountain	*dʐ-	A2	dʐɯ	zʏu	tsha
9. choose	*dʐ-	A2	---	zen	tshe

*4.1.4.2. Retroflexed sonorants *ɳ-, *ɭ-, *r-, *hr-*

Similar to the retroflexed obstruents, the retroflexes ɳ- and ɭ- are reflected distinctly from their alveolar counterparts as Qiaoshang spirants. Initials *r- and *hr- usually become modern fricatives and may also be distinguished from each other by their original tonal series.

	Proto-Gelao		Laozhai	Qiaoshang	Wanzi
1. thick	*ɳ-	A2	ni	ze	ntau
2. bird	*ɳ-	D2	ni	zau	ntau
3. fat	*ɳ-	A2	nõ	zø	nan
4. give	*ɳ-	D2	---	zɒ	ni
5. salty	*ɳ-	A2	---	za	naŋ A1
6. near	*ɭ-	C2	lʏɯ	ze	lau
7. hawk	*ɭ-	C2	lu	zø	li
8. bee	*r-	A2	ʐə	ʐa	zei
9. sick	*r-	C2	ʐɪ	ʐɪ	zai
10. ear	*r-	A2	zi	ʐe	zau
11. drink	*hr-	C1	ʐɑ̃	sen C2	han
12. cut	*hr-	C1	ʐo	---	han

Notes

5. This etymon perhaps points to *ʔɳ-. Cf. 4.1.3.2, #4 'six', where the Wanzi form similarly shows tone series 1 corresponding to Qiaoshang form with tone series 2.

12. For Ng, cf. Majiang /ɕe^{33}/.

4.1.5. Spirants *v-, *(ɣ)w-, *x-

The spirant *v- has been devoiced in Qiaoshang but remained voiced in the other varieties. On the other hand, the labio-velar *(ɣ)w- has become modern v- instead, both in Qiaoshang and in Wanzi. The Laozhai approximant ɣ- before w- may be considered as an innovated onglide, in which case *(ɣ)w- may be simply reconstructed as *w-.

	Proto-Gelao		Laozhai	Qiaoshang	Wanzi
1. sieve	*v-	A2	vu	fy	vi
2. go	*v-	C2	---	fo	vu
3. thin	*(ɣ)w-	C2	ɣwə	vau	vu
4. sun	*(ɣ)w-	A2	ɣwo	---	---
5. hat	*x-	A1	hau	---	hu
6. pluck	*x-	B1	---	χe	hau

Notes

1. Shanbeihou variety has /ʑi^{31}/, perhaps pointing to *vj- (cf. 4.1.6.4).

4. For Ng, see Majiang /ve^{31}/.

4.1.6. Complex onsets

The first or initial members of complex onsets may be stops, nasals or spirants. Usually, the second members or medials are the resonants -l-, -r-, -j- or -w-. The combination of -w- plus a liquid (-l- or -r-) is also attested. The tonal series are usually assigned according to the voicing property of the initial members. Examples are few in some types and their reconstructions remain tentative.

4.2.6.1. Voiceless stops as the initial member.

***pl-** The medial -l- may be lost in certain circumstances in different varieties. For instance, in Laozhai it is lost before modern -u (#3), while in Qiaoshang it is lost before back vowels in general (#5-6). In Wanzi, the medial is lost early before proto *-u (#5).

	Proto-Gelao		Laozhai	Qiaoshang	Wanzi
1. blood	*pl-	D1	plɑ	ple	plɒ
2. peach	*pl-	A1	plo	---	plaŋ
3. alive	*pl-	C1	pu	---	pləɯ
4. split	*pl-	B1	---	---	plau
5. liquor	*pl-	A1	plʏu	pu	pa
6. boil (n.)	*pl-	C1	plɑu	po	---

Notes

1-3. The Pudi (Dafang) variety uniquely shows prenasalization in their reflexes of these words: /mpɛ^{13}/, /mpɑŋ^{55}/ and /mpɛ^{33}/ respectively.

3. For the retention of -l- in Swg, cf. Niupo /plɯ^{55}/. For Ng, cf. Majiang /pɑu^{24}/ (this variety does not keep medial -l- for this rime).

***pr-** The medial -r- has at times induced aspiration, thus pr- has become phr- in some dialects. In dialects where -r- later merged into -l-, the aspirated quality is sometimes the only feature which distinguishes early *pl- from *pr-. Cf. Niupo /phlɯ^{35}/ 'silver' (for *pr-) contrasting with /plɯ^{55}/ 'alive' (from *pl-).

	Proto-Gelao		Laozhai	Qiaoshang	Wanzi
7. shoulder	*pr-	A1	phrə	py	phɒ
8. silver	*pr-	B1	phrə	---	---

***pwl- and *pwr-** The labio-velar medial -w- may be found as the first medial member before -l- or -r-. In this environment the Qiaoshang reflex is a sptrant (e.g. *pwl- > vl-). It is still unclear, however, why *pwr- shows in Qiaoshang a reflex of tone series 2 in contrast with tone series 1 for *pwl- (both become Qiaoshang vl-). Majiang, on the other hand, interestingly shows spirant v- for *pwl- (> vl- > v-), but affricates (ts- or tɕ- depending on the following vowels) for *pwr- (> pr- > ts-). Again, in Wanzi, the medial has been lost before *-u (#9 *-ut and #11 *-un). In Laozhai, the medial -r- is kept faithfully only before modern schwa, otherwise it has merged into -l- (cf. the similar conditioned variants in this variety under *kr-).

	Proto-Gelao	Laozhai	Qiaoshang	Wanzi
9. ten	*pwl- D1	---	vlo	pe
10. year	*pwr- A1	prə	vlen A2	plei
11. die	*pwr- A1	plen	vlen A2	pen

Notes

9-11. Majiang has following respective forms: /ve^{53}/, /tsə^{24}/ and /tɕi^{55}/.

***kl-** This cluster has been kept in Wanzi. In Qiaoshang the medial -l- has become -w- (probably through velarized -ɬ-). In Laozhai, on the other hand, the initial has been weakened into a preglottalized feature of the surviving medial.

	Proto-Gelao	Laozhai	Qiaoshang	Wanzi
12. grandson	*kl- A1	---	kwai	klu
13. close eye	*kl- D1	ʔlæ	kwa	kle
14. take off	*kl- D1	---	kwe	klu
15. lazy	*kl- D1	ʔlæ	kwen	kle
16. fingernail	*kl- D1	ʔlæ	---	kle

Notes

12, 13, 16. Majiang shows a spirantal reflex for the first two roots: /zo^{53}/ (#12) and /ʑe^{53}/ (#13), probably through retroflex *ʅ- < *kʅ-), but lateral for the last: /lie^{33}/ (#16). The last example has proto-rime *-it; perhaps the palatal vowel *-i- has blocked the preceding medial from being retroflexed.

***kr-** The reflexes of this cluster in Laozhai and Wanzi are similar to those of *kl-. The medial -r- is kept in these dialects only when followed by shwa (in #17-18, it appears as retroflexed vowel in Wanzi). The early velar has normally become Wanzi postvelar q-; the k- variant is only found in the modern cluster kl-. In Qiaoshang it has become ɣ- (probably through < kɣ-).

	Proto-Gelao		Laozhai	Qiaoshang	Wanzi
17. house	*kr-	A1	ʔrə	ɣai	qɚ
18. head	*kr-	B1	ʔrə	ɣai	klɒ
19. person/Gelao	*kr-	C1	ʔlʏɯ	ɣe	klau
20. road	*kr-	A1	---	ɣen	qen

Notes

20. Another instance of Wanzi losing the medial before *-un. For Swg, cf. Niupo /ʔlɑn^{31}/.

***kw-** This onset is separated from simple initial *k- mainly on the basis of spirant reflexes in Northern varieties, as exemplified by Qiaoshang ɣ- (Majiang has x-). Also, the proposed medial *-w- may be indirectly substantiated by its effect on modern vowel reflexes. For instance, Wanzi -ɒ instead of expected -an in item #24 may have

developped as follows: -wan > -uɒ (normal loss of nasal ending after long vowel, cf. 4.2.2) > -ɒ.

	Proto-Gelao	Laozhai	Qiaoshang	Wanzi
21. horn	*kw- A1	qɤu	ɣɤu	qa
22. leg	*kw- A1	qɤɯ	ɣeu B1	qau
23. ax	*kw- A1	qɪ	ɣai	qu
24. smoke	*kw- A1	---	ɣø	qɒ
25. skin	*kw- B1	qo	ɣo	qɒ

Notes

21-24. For extra-Kra evidence of medial -w-, cf. Saek /kwau A1/ (#21), /kwaa A1/ (#22), Thai /khwaan A1/ (#23) /khwan/ A2 (#24).

***kj-** There are two competing correspondence sets for this onset. The first one is supported by a good Kra etymon 'iron' (#26). It shows the palatalization of the initial by medial -j- in both Wanzi and Qiaoshang (*kj- > tɕ-). In Laozhai, the development is parallel with that of *kl- and *kr-, where the velar stop initial is wealened into glottalized quality preceding the medial.

The other set shows Wanzi and Qiaoshang reflexes having been fricated into x- (we temporarily mark it as *kʒ-, #27-29). The palatal medial may also be postulated by the fact that Majiang shows for this onset the reflex /s-/, which is normally its reflex of pre-palatal or palatal affricates (i.e. *kʒ- > *tʃ- or *c- > s-). Cf. Majiang /so^{24}/ (#27) and /so^{33}/ (#28).

	Proto-Gelao		Laozhai	Qiaoshang	Wanzi
26. iron	*kj-	C1	ʔjo	tɕø	tɕin
27. dry	*kʒ-	B1	qʏɯ	---	xau
28. light	*kʒ-	C1	qʏɯ	χe	xau
29. heavy	*kʒ-	A1	qo	χø	xen

Notes

29. The Majiang reflex remains unpalatalized /q-/ before *-ăn in this example: /qɑi^{24}/ (#28). The other two examples (#27-28) where palatalization occur have open low rime *-a.

There remain a few other correspondence sets whose reconstruction is somewhat hypothetical. We temporarily posit alveolar clusters for these sets.

***tl-** The Wanzi reflex merges with that of *kl-, probably through dissimilation of the initial and medial (*tl- > kl-). The fricative quality, which has brought about the Laozhai and Qiaoshang reflex ɬ-, presumbly occurred during the transition when the stop closure released into a lateral approximant (e.g. tl- > tθl- > ɬ-).

	Proto-Gelao		Laozhai	Qiaoshang	Wanzi
30. flow	tl-	A1	---	ɬi	klai
31. rock	tl-	B1	ɬʏɯ	---	klau
32. waist	tl-	C1	ɬʏu	---	kla

Notes

1. For Swg, cf. Niupo /ɬei^{33}/.

2-3. For Ng, cf. Majiang /liu^{24}/ and /lɑu^{33}/ respectively. This variety also normally shows plain l- for PG *ɬ-.

***tr-** The reflexes in all representative varieties are affricates, but the correspondences do not fit with any of the established PG affricates. With its retroflex reflexes in Laozhai and Qiaoshang, this correspondence set may appear to be competing for PG *tʂ-. We have preferred the earlier proposed set for *tʂ- (4.1.4.1) for several reasons. One reason concerns the Qiaoshang spirant reflex /z-/ for that established set, which we have taken as a general indication of early retroflex initials (including, namely, *ʈ-, *ɖ- and others in the series). Another reason is suggested by extra-Gelao evidence. Lachi shows an affricate initial /tɕ-/ for the established affricate *tʂ-, but has an alveolar stop reflex /t-/ for this *tr- set.

	Proto-Gelao		Laozhai	Qiaoshang	Wanzi
33. nest	*tr-	C1	tʂɑ	---	tsɒ
34. sprout	*tr-	C1	tʂɑ	---	tsɒ
35. birth	*tr-	C1	---	tʂo	tsɒ

4.16.2. Voiced stops as the initial member

Examples of this type of clusters are rare. But the development of these proto-initials to modern reflexes is parallel with that of their voiceless counterparts. These initials all have series 2 tones.

	Proto-Gelao		Lozai	Qiaoshang	Wanzi
36. duck	*bl-	A2	blu	plo	---
37. orphan	*bl-	C2	blɑ̃	---	---
38. louse	*dr-	A2	dʐu	tʂø	tshen

Notes

37. For Ng, cf. Majiang /vuŋ^{33}/, which perhaps pointing to *bwl-. See a parallel example: Majiang /ve^{53}/ 'ten' from *pwl- (4.1.6.1).

4.1.6.3. Nasals as the initial member

The reflexes of these clusters are mostly parallel with those of their stop counterparts. The reconstruction of medial -r- in #42 is based on Wanzi retroflexed vowel reflex. For #44, the Qiaoshang nasalized spirant ɣ̃- is a normal reflex of early velar nasal before non-front vowels (cf. 4.1.3.1).

	Proto-Gelao		Laozhai	Qiaoshang	Wanzi
39. five	*ml-	A2	mlen	mbau	mpu
40. frost	*ml-	A2	---	---	mplai
41. tongue	*ml-	A2	mlõ	---	---
42. ghost	*mr-	A2	---	---	mpɚ
43. sesame	*ŋl-	A2	---	---	ŋklau
44. dew	*ŋl-	C2	---	NʁYu	ŋkla
45. yellow	*ŋj-	C2	ɳi	ɳdza	ntɕi
46. nose	*hŋj-	D1	---	ɳdzɒ	ɳtɕe

Notes

40. For Swg, cf. Niupo /mlei^{53}/.

41. For Ng, cf. Majiang /mu^{31}/. (Majiang normally lost medial -l- in bilabial clusters. It has simple initial /p-/ for *pl-, for instance.)

42. For Swg, cf. Niupo /mlɯ^{31}/.

45-46. For the reflexes of original velar nasals, cf. Majiang /ŋɑi^{53}/ (#45) and Niupo /ŋɛ^{35}/ (#46).

4.1.6.4. Resonants as the initial member

The resonant clusters *vj-/*vr- and *(ɣ)wj- have often merged with the simple initials *v- and *(ɣ)w- in Wanzi and Qiaoshang. But in Laozhai, the medial has often

survived well as the initial of the reflexes (ʑ- for *-j- and ʐ- for *-r-). The cluster *(ɣ)wr- seems to have metathesized early into ʐw- and then ʐ- in Qiaoshang (#53).

	Proto-Gelao		Laozhai	Qiaoshang	Wanzi
47. tall	*vj-	A2	ʑu	fy	vi
48. wind	*vj-	A2	ʑu	fy	ven
49. wing	*vj-	A2	ʑə	---	vu
50. tendon	*wj-	A2	ʑu	vy	ven
51. kill	*vr-	A2	ʐen	---	ven
52. fly (n.)	*vr-	A2	ʐo	fy	van
53. eight	*wr-	A2	---	ʐɣu	vla
54. put	*wl-	A2	---	vlɪ	vlɒ

Notes

49. For Ng, cf. Majiang /fɑu^{31}/.

54. For Swg, cf. Niupo /luɑ^{31}/.

4.1.7. Summary of PG initials

Simple initials

p	t	ʈ	ts	tʂ	tʃ	c	k	ʔ
b	d	ɖ	dz	dʐ	dʒ	ɟ	g	
m	n	ɳ				ɲ	ŋ	
hm	hn					hɲ	hŋ	
v	l	ɭ	z	r	ʒ		(ɣ)w	
	hl		s	hr	ʃ		x	

Complex initials

With -l-			With -r-		
pl	tl	kl	pr	tr	kr
bl				dr	
ml		ŋl	mr		
		wl	vr		wr

With -wl-/-wr-	With -w-/-j-	
pwl-	kw-	kj-
pwr-	vj-	ŋj-

There is a possiblity that a few more complex onsets may turn up. Cf. the following examples, which might point to *b-l- and *m-l- contrasting respectively with *bl- (4.1.6.2) and *ml- (4.1.6.3):

		Laozhai	Qiaoshang	Wanzi
barrel	A2	bloŋ	zoŋ	luŋ
crawl	B2	mlʏɯ	---	lau

Examples are often too few in such cases, and we have not attempted to complicate the initial inventories by including all these potential types until better supporting material turns up.

4.2. Proto-Gelao rimes

The rimes in Gelao have drastically diverged from the originals. In fact it is often impossible to figure out precisely what the reconstructed rimes should be without taking into consideration the reflexes in other Kra languages. For instance, the basic rime *-a may be reflected as almost everything (e.g. /-i/ in Laozhai, /-e/ in Qiaoshang, /-ɯ/ in Niupo, /-o/ in Majiang, -au in Wanzi, etc). Moreover, within each proto-rime, a given dialect may have variant reflexes due to the influence of initial consonants (e.g. *-a may become either -i or -ʏɯ in Laozhai). Without extra-Gelao clues, such variant reflexes may easily lead us to set up different proto rimes, and we will end up by positing unbelievably rich arrays of proto-rimes. Another obvious instance is the case of checked rimes, where no modern Gelao dialects keep the final stops intact; still two stop endings (*-t and *-k) need to be reconstructed at the Proto-Gelao level (4.2.3).

As a footnote following each comparative table in this section, we will also include as reference related forms from other Kra languages, especially Buyang and Laha. (These two languages have kept the original rimes mostly intact.) On the other hand, it should be emphasized that these are used merely to provide clues, and that we have not attempted to superimpose facilely the rime from any given Kra language onto Proto-Gelao. It is needless to say that no language has completely kept all the Proto-Kra rimes intact, though we may say that some languages may have adopted lesser changes in this respect. Thus it is still the evidence internal to Gelao that will ultimately confirm the proposed system and justify whether such a system allows us naturally to explain the development from the proto-stage to the modern dialects.

4.2.1. Open rimes

Six monophthongs and three diphthongs may be reconstructed. There is no contrast of short and long vowels in open rimes.

*4.2.1.1. *-a*

This proto-rime has become -e in Qiaoshang and -au in Wanzi. In Laozhai the reflexes are -ʏɯ after grave initials and -i after acute initials.

		Laozhai	Qiaoshang	Wanzi
1. eye	A2	ti	ze	tau
2. thick	A2	ni	ze	ntau
3. horse	C2	ɳi	ɳdze	ɳtcau
4. paddy	A1	tɕi	se	tsau
5. ear	A2	zi	ʐe	zau
6. tear (n.)	C2	zi	se	tsau
7. hand	A2	mi -v	mbe	mpau
8. snake	A2	ŋʏɯ	ŋge	ŋkau
9. expensive	B1	qʏɯ	qe	qau
10. light (a.)	C1	qʏɯ	χe	xau
11. dry	B1	qʏɯ	---	xau
12. cogon	A1	qʏɯ	qe	---
13. bran	B1	pʏɯ	---	pau
14. pluck	B1	---	χe	hau
15. flower	C1	---	ŋge	ŋkau

Notes

7. The Laozhai reflex is irregular, as if there is a preceding medial -j-. Cf. Sui /mjaa A1/.

* Buyang: 1. taa 2. naa 3. ŋaa 5. ðaa 7. maa 8. ŋaa 10. khaa 11. haa 12. ʔaa 13. faa.

*4.2.1.2. *-i-*

This rime is kept as /-i/ in Laozhai and Qiaoshang. In Laozhai, the variant /-ɪ/ is found after retroflexed and postvelar initials (#9-10), and the apical vowel /ɿ/ is found after sibilants (#6). In Qiaoshang, the variant /-ɪ/ (#4-9) is found after sibilants, and /-ai/ after postvelars (#10-11). In Wanzi the rime is regularly diphthongized into /-ai/.

		Laozhai	Qiaoshang	Wanzi
1. tree	A1	ti	ti	tai
2. flow	A1	---	ɬi	klai
3. many	B1	---	ʔi	ʔai
4. far	A2	li	zɪ	lai
5. intestine	C1	ɕi	sɪ	sai
6. satiated	B1	tsɿ	tsɪ	tshai
7. snow	A2	---	zɪ	ntai
8. ask	C1	---	tsɪ	sai
9. sick	C2	ʐɪ	zɪ	zai
10. chicken	A1	qɪ	qai	qai
11. ladder	A1	ʔli	ɣai	klai

* Buyang: 4. lii 6. θii 9. ðii.

*4.21.3. *-e*

This rime has generally merged with *-i in Laozhai and Wanzi. In these varieties, a subtle distinction between *-e and *-i may be found in their variant reflexes, however. For instance, Wanzi shows the variant -ei after early retroflexed initials (cf. /zei/ 'bee', #4); such a variant does not occur with rime *-i (cf. /zai/ 'sick', #9 above). Similarly, the Laozhai variant -æ for *-e (#5) contrasts with the variant -ɪ for *-i after postvelars. After

early *r-, the reflex is centralized into schwa (cf. the similar centralization in the rime *-ai). Qiaoshang clearly distinguishes the two front rimes by showing the low vowel -a reflex for *-e. Internal Gelao evidence does not allow us to determine whether the last two examples (#9 and #10) belong to *-i or *-e, since the crucial Qiaoshang forms are lacking.

		Laozhai	Qiaoshang	Wanzi
1. ascend	A1	ʔi	ʔa	ʔai
2. throat	A1	---	χa	qhai
3. seed	A1	pi	pa	---
4. bee	A2	ʐə	ʐa	zei
5. limp	C1	qæ	χja	qei
6. use	C2	læ	za	lai
7. send	C2	---	va	vai
8. fire	A1	---	pa	pai
9. frost	A2	---	---	mplai
10. comb	A1	sʅ	---	sai

* Buyang: 3. pee 9. mee 10. θee.

*4.2.1.4 *-u*

This rime has become slightly onglided to -ʏu in Laozhai and Qiaoshang, except after labials where it remains -u. In Laozhai, the -u after modern labial nasal has dropped, and the initial has become syllabic nasal (#9-11). Also, after early retroflexed initials, the Laozhai reflex has been centralized to -ɯ. In Wanzi, it has regularly become -a.

		Laozhai	Qiaoshang	Wanzi
1. ash	B1	tʏu	tʏu	ta
2. old	B1	qʏu	qʏu	qa
3. horn	A1	qʏu	ɣʏu	qa
4. eight	A2	---	ʐʏu	vla
5. son-in-law	C2	---	zʏu	tsa
6. waist	C1	ɬʏu	---	kla
7. pig	A1	hʏū	ŋgʏu	mpa
8. liquor	A1	plʏu	pu	pa
9. smelly	B2	ɱ	mbu	mpa
10. ripe	B1	ɱ	ŋgʏu	ŋka
11. pus	B1	ɱ	---	ŋka
12. mountain	A2	dʐɯ	zʏu	tsha
13. pillar	A1	tɕɯ	---	sa

* Buyang: 1. tuu 2. ʔuu 3. ʔuu 4. ðuu 7. muu 10. muu 11. muu 13. θuu.

*4.2.1.5. *-o*

This rime remains -o in Laozhai. It has merged with *-u and become -a in Wanzi (parallel with the general merger of *-i and *-e in this dialect). In Qiaoshang it has been diphthongized into -au.

		Laozhai	Qiaoshang	Wanzi
1. laugh	A1	so	sau	sa
2. know	A1	so	---	sa
3. door	A1	hõ	ŋkau	ŋka
4. take by force	A2	---	lau	la

5. tie (v.)	C1	---	tau	ta
6. escape	B2	---	ʐau	za

* Buyang: 1. θoo. Laha: 2. soo.

*4.2.1.6. *-ə*

This rime has remained as Laozhai -ə, which becomes -o/-u after labials. It has merged with *-o and become -au in Qiaoshang. In Wanzi, it has become -u (perhaps via -əu, in parallel with *-a > -au).

		Laozhai	Qiaoshang	Wanzi
1. wing	A2	ʑə	---	vu
2. thin	C2	ɣwə	vau	vu
3. you	A/B2	mo A2	---	mu B2
4. four	A1	pu	pau	pu

* Both Laha and Buyang usually have -aa for this rime (merging with *-a). Pubiao shows variants -aa (after postvelar) and -ii/-ee (after labials): 2. Gaa 3. mfiii A2 4. pee.

*4.2.1.7. *au*

This rime has normally merged with *-au and become -o in Qiaoshang. It has regularly become Wanzi -əɯ. Laozhai shows two variants, -u and -ɑu, the latter of which occurs after labials and sibilants.

		Laozhai	Qiaoshang	Wanzi
1. navel	A2	---	zo	---
2. younger brother	B2	ʑu	so	tsəɯ

3. duck	A2	blu	plo	---
4. pick up	C1	---	po	pəɯ
5. chopstick	C2	dzɑu	tso	tsəɯ
6. male	C1	pɑu	po	---
7. cooked rice	C2	mɑu	mbo	mpəɯ

* Buyang: 1. ʔduə A1 2. juə. Laha: 1. dau 2. jau.

*4.2.1.8 *-ai*

This rime appears to have merged with *-e in Laozhai and with *-i in Qiaoshang (with similar conditioned variants as those of the respective rimes *-e and *-i in those dialects). In Wanzi, it has become -ɒ.

		Laozhai	Qiaoshang	Wanzi
1. female	C2	mi	mbi	mɒ
2. monkey	C1	tɕi	ti	tɒ
3. rat	C1	ɕi	ɬi	lɒ
4. good	A1	---	ʔi	ʔɒ
5. excrement	C1	qæ	qai	qɒ
6. see	A1	qæ	---	qɒ
7. head	B1	ʔrə	ɣai	klɒ

* Laha: 3. lai 4. ʔai 5. kai 6. kai.

*4.2.1.9. *-au*

This rime has merged with *-aɯ and become -o in Qiaoshang, while it has merged with *-ai and become -ɒ in Wanzi. In Laozhai, it has become -ɑ (with the variant -o after postvelars, #5)

		Laozhai	Qiaoshang	Wanzi
1. meat	C1	ʔɑ	---	ɒ
2. nest	C1	tʂɑ	---	tsɒ
3. sprout (v.)	C1	tʂɑ	---	tsɒ
4. birth	C1	---	tʂo	tsɒ
5. skin	B1	qo	ɣo	qɒ

* Paha: 1. ʔaau 2. ðaau.

A main reason for reconstructing the last three rimes as diphthongs (*-aɯ, *-ai and *-au) instead of monophthongs (namely, *-ɯ, *-ɛ and *-ɔ respectively) is because they have never occurred in closed rimes. Only six distinct vowels are found with final consonants. By reconstructing these rimes as diphthongs, we can more naturally explain their failure to appear with final consonants as a constraint which applied to the whole distinct class of vowels. If we reconstruct them as monophthongs, we cannot explain equally well why it is exactly these three vowels which have adopted such a co-occurrence constraint.

4.3.1.10 Summary of open rime correspondences

	Laozhai	Qiaoshang	Wanzi
*-a	-ʏɯ	-e	-au
*-i	-i	-i	-ai
*-e	-i	-a	-ai
*-u	-ʏu	-ʏu	-a
*-o	-o	-au	-a
*-ə	-u	-o	-u
*-aɯ	-ɑu	-o	-əɯ
*-ai	-i	-i	-ɒ
*-au	-ɑ	-o	-ɒ

(Variants are not listed in this summary table).

4.2.2. Rimes with sonorant endings

Two nasal endings, *-n and *-ŋ, may be reconstructed for PG. It also appears to be necessary to reconstruct vowel length before these endings. This is hypothesized on the basis of the fact that the finals have been often kept after short vowels but lost after long vowels.

*4.2.2.1. *-an*

This rime is kept as such in Wanzi. It has become -o and ø in Laozhai and Qiaoshang respectively. In Qiaoshang, the reflex -ø is raised to -y after labials (#13-16). The survival of a nasality trace in certain Laozhai forms seems to be enhanced by nasal initials (#10-11), with one exception (#12). Extra-Gelao comparisons show that this rime came from the merger of original *-am and *-an.

		Laozhai	Qiaoshang	Wanzi
1. hair	A1	so	sø	san
2. egg	A1	to	zø	tan
3. plant (v.)	C1	to	tø	tan
4. bitter	A1	qo	---	qan
5. hatch	C1	qo	---	qan
6. six	A1	---	ndø A2	nan
7. bite	C2	ʐo	---	zan
8. cut	C1	ʐo	---	han
9. stay	A1	---	ʔø	ʔan
10. oil	A2	mlõ	zø	nan
11. deaf	C2	ɳõ	ɣ̃ā -v	ŋan
12. ear of grain	A1	qõ -v	---	qan
13. tooth	A1	pi	py	pan
14. dream	A1	pi	py	pan
15. rub	A1	---	py	pan
16. fly (n.)	A2	ʐo	fy	van

Notes

11. This is the only example where Qiaoshang has the reflex -ā for this rime, perhaps due to the preceding unique initial ɣ̃-.

13-14. Laozhai -i after labials looks strange, but no counter-examples are found. For these words, Niupo unexpectedly shows medial -l-: /plɑŋ^{31}/ and /plɑ^{31}/ respectively. Otherwise reflexes in all Kra languages simply suggest *p- for these etyma.

*Buyang: 1. θam 2. tam 3. tam 4. ʔam 6. nam 7. ðam 9. ʔan 14. pan

After palatal medials, the Wanzi reflex -an becomes -en, which is further raised to -in after modern palatal initials (#21). (The cluster *dr-, #19, has probably first become *dʒ- and affected the vowel in the same way as other palatal onsets did). Laozhai raised its reflex -o > -u, except after velar clusters. Qiaoshang shows the normal reflex -ø, which becomes -y after labials.

		Laozhai	Qiaoshang	Wanzi	
17. tendon	A2	zu	vy	ven	*wj-
18. wind	A2	zu	fy	ven	*vj-
19. louse	A2	dʐu	tʂø	tshen	*dr-
20. heavy	A1	qo	χø	xen	*kʒ-
21. iron	C1	ʔjo	tɕø	tɕin	*kj-

*4.2.2.2. *-aŋ*

This rime is again kept as such in Wanzi. In Qiaoshang, the velar ending has induced nasalization of the vowels. The Laozhai reflex is the same as that of *-an, with an example of nasalized vowel probably being enhanced by the prenasalization of the initial [ⁿd-] (#2).

		Laozhai	Qiaoshang	Wanzi
1. cook	B1	to	tã	taŋ
2. crow (v.)	A2	dõ	zã	thaŋ
3. peach	A1	plo	---	plaŋ
4. salty	B1	---	zã B2	naŋ
5. measure (v.)	B2	---	kã	kaŋ
6. forehead	A2	---	tã	---

*4.2.2.3. *-aan*

The nasal ending has been lost in all dialects after long vowels. The Laozhai reflex appears to have merged with *-i (note the same conditioned variants, -ɪ after postvelars (#6) and -ə after -r- (#8)). This rime has become -ai and -u in Qiaoshang and Wanzi respectively.

		Laozhai	Qiaoshang	Wanzi
1. new	A2	mi	mbai	mu
2. thorn	C2	ɳi	ɳdʑai	ɳu
3. husked rice	A1	tɕi	sai	su
4. grandchild	A1	---	kwai	klu
5. scold	B1	ʔi	ʔai	---
6. ax	A1	qɪ	ɣai	qu
7. light (v.)	A1	---	ɣai	qu
8. house	A1	ʔrə	ɣai	qɚ

* Buyang: 1. maan 2. ɳaan 6. ʔaan.

*4.2.2.4. *-aaŋ*

This rime has regularly become Laozhai -u. Qiaoshang has the reflex -ø, with variants -y after labials (#1-2) and -i after palatals (#5). Wanzi shows -i, which becomes -ɚ after *-r- medial.

		Laozhai	Qiaoshang	Wanzi
1. tall	A2	ʑu	fy	vi
2. sieve	A2	vu	fy	vi
3. hawk	C2	lu	zø	li

4. sorghum	A2	---	sø	tɕhi
5. mosquito	A2	---	ʑi	tɕhi
6. root	A1	tsu	---	---
7. ghost	A2	---	---	mpɘ

* Buyang: 1. vaaŋ 2. vaaŋ A1 3. laaŋ 4. jaaŋ 5. jaaŋ 6. θaaŋ.

*4.2.2.5. *-un*

This rime has become -en (probably through -ən) in all dialects here.

		Laozhai	Qiaoshang	Wanzi
1. road	A1	---	ɣen	qen
2. rain	A2	men	mben	mei -f
3. die	A1	plen	vlen	pen
4. back	A2	len	zen	---
5. buy	A1	tsen	tsen	sen
6. kill	A2	ʐen	---	ven
7. tear (v.)	B1	qen	---	qen

Notes

2. This is the only form where Wanzi has lost a nasal reflex, perhaps through dissimilation with the nasal initial.

* Buyang: 1. hun 2. mun.

*4.2.2.6. *-uun*

Another example of the regular loss of nasal ending after early long vowels. This rime has become Laozhai -u, with variants -o after postvelars and -ɿ after sibilants. In Qiaoshang and Wanzi, it has usually become -ɒ and -əɯ respectively.

		Laozhai	Qiaoshang	Wanzi
1. front	A1	qo	---	qəɯ
2. teach	A1	tʂʅ	zɒ	səɯ
3. heart	C1	---	lɒ	ləɯ
4. play	A2	zʅ	sɒ	zəɯ
5. alive	C1	pu	---	pləɯ
6. saliva	A1	qo	---	---

* Buyang: 1. ʔɔɔn 2. θɔɔn.

*4.2.2.7. *-uŋ*

This rime has become -oŋ or -uŋ in most dialects. Wanzi appears to have developed a unique loss of nasal ending after non-sonorant initials in this rime (#1-3).

		Laozhai	Qiaoshang	Wanzi
1. cave	A2	boŋ	poŋ	phu
2. lightning	A1	---	qoŋ	qu
3. mouth	A2	---	ŋgoŋ	ŋku
4. barrel	A2	bloŋ	zoŋ	luŋ
5. vegetable	A2	loŋ	---	luŋ
6. stomach	A1	ɬoŋ	---	luŋ

*4.3.2.8. *-uuŋ*

For this rime, Laozhai and Wanzi show the same reflexes as those of *-uun. But Qiaoshang distinguishes the two by having -au for this rime, contrasting with -ɒ for *-uun. Qiaoshang also shows the variant -oŋ after z-, as if the rime has merged early with the *-uŋ in this environment.

		Laozhai	Qiaoshang	Wanzi
1. water	C1	ʔɱ	ʔau	ʔəɯ
2. salt	A2	ɳu	---	ɳtcəɯ
3. cloth	A1	---	sau	səɯ
4. drum	A2	---	zoŋ	ləɯ
5. star	A2	---	zoŋ	---

Notes

1. The Laozhai rime reflex for this root probably developed as follows: first metathesis, *ʔuŋ > *ʔŋu, then assimilation, *ʔŋu > *ʔmu, followed by the loss of -u after m- (cf. 4.2.1.4, #10-11, for the parallel development *hŋu (> hmu) > ɱ.

* Buyang: 1. ʔɔɔŋ 4. lɔɔŋ 5. lɔɔŋ.

*4.2.2.9. *-iN*

The Wanzi and Qiaoshang reflexes of this rime merge with those of *-un (probably through -ən). But Laozhai has -ã for this rime, contrasting with -en for *-un. Extra-Gelao comparison shows that a number of words in this rime came from early *-um, perhaps through rounding dissimilation of the vowel and bilabial ending (*-um > -im > in). It appears that there is no contrast between alveolar and velar finals (*-in/-iŋ) after high front vowels.

		Laozhai	Qiaoshang	Wanzi
1. beard	C2	---	---	men
2. steal	C2	lã	zen	len
3. pound	C1	tã	ten	ten
4. razor (v.)	C1	ʐã	ʐen	---
5. shallow	C2	dzjã	zen	ten B1

6. drink	C1	ʐɑ̃	sen C2	han -v
7. hold in mouth	A1	---	---	qen

* Buyang: 1. muəm 2. luəm 5. tiən B2 7. ʔum. Laha: 5. dəl. Pubiao: 6. hɑm.

*4.3.2.10. *-iiN*

This rime has become -i in Laozhai (merging with *-i), with variants -ɪ after postvelars and -ə after -r-. It appears to have merged with *-iN and become -en in Qioashang.

		Laozhai	Qiaoshang	Wanzi
1. garden	A2	---	fen	vei
2. year	A1	prə	vlen	plei
3. cucumber	A1	tɕi	---	---
4. leaf	C2	ʑi	ʐen	---

* Buyang: 2. ðiaŋ A2 3. tiaŋ A2 4. ðiaŋ.

4.2.2.11. Summary of nasal rime correspondences.

PG	Laozhai	Qiaoshang	Wanzi
*-an	-o	-ø	-an
*-aŋ	-o	-ã	-aŋ
*-aan	-i	-ai	-u
*-aaŋ	-u	-ø	-i
*-un	-en	-en	-en
*-uŋ	-oŋ	-oŋ	-uŋ

*-uun	-u	-ɒ	-əɯ
*-uuŋ	-u	-au	-əɯ
*-iN	-ɑŋ	-en	-en
*-iiN	-i	-en	-ei

(Variants are not listed in this summary table).

The system of Gelao nasal rimes is shown to have contained two endings: *-n and *-ŋ. These endings appear to have been neutralized after high front vowels *-i/*-ii. As we have seen, while the final nasals after early short vowels has been kept in several modern reflexes, they hardly survived after early long vowels (the exception is Qiaoshang reflexes of *-iiN, where we must assume its early merger with the short rime counterpart *-iN). This fate of the nasal endings constitutes a basis for us to reconstruct a PG system of three vowels with length contrast instead of one with six vowels with contrastive height. In other words, we consider it to be phonetically more reasonable to assume that the loss of final nasals was due to the longer sonorant duration of the preceding long vowels (which are two morae, in contrast with one-mora short vowels).

Still, since we have reconstructed six PG vowels in open rimes (without length contrast), it is likely that this nasal rime system of three vowels plus length contrast had developed from an earlier system of six vowels which contrasted qualitatively. The choices are thus whether we should assume that this innovation of a length contrast was already completed at the PG level, or that it was a parallel development in each variety. We have chosen the former in the preceding presentation. The equation of these two systems is as follows:

With length contrast	Without length contrast
*-an	*-ən
*-aan	*-an
*-aŋ	*-əŋ
*-aaŋ	*-aŋ
*-un	*-on
*-uun	*-un
*-uŋ	*-oŋ
*-uuŋ	*-uŋ
*-iN	*-eN
*-iiN	*-iN

4.2.3. Rimes with stop endings

Two stop endings, *-t and *-k, as well as vowel length may be reconstructed in parallel with those of nasal rimes. The Laozhai reflexes of these rimes are usually accompanied by slight vowel constriction. All these rimes only occur with one proto tone (i.e. tone *D, which later split into two series after the initial mutation).

*4.2.3.1. *-at*

This rime has become -æ and -e in Laozhai and Wanzi, respectively. In Qiaoshang, it has become -ɒ, which has been dissimilated into -a after rounded medial -w-.

		Laozhai	Qiaoshang	Wanzi
1. close eye	D1	ʔlæ	kwa	kle
2. liver	D1	tæ	---	---
3. forget	D2	---	---	te
4. flea	D1	ɲæ	ŋkwa	mpe
5. nose	D1	---	ɳdzɒ	ɳtce

* Buyang: 2. tap 3. ʔdap D1 4. mat.

*4.2.3.2. *-ak*

Laozhai and Qiaoshang have merged this rime with *-at. In Laozhai, the reflex -æ is variantly raised to -i after palatals. In Wanzi, the rime has merged with *-aŋ and become -aŋ. This development from *-ak > -aŋ may have gone through the stage of preploded nasal (*-ak^{ŋ}), under the influence of the preceding short vowel which created a premature glottal closure (i.e. *-a^{ʔ}k > *-ak^{ŋ} > -aŋ). At the stage of constricted stop *-a^{ʔ}k, if the ending was unreleased, it would become glottal stop /-ʔ/ which could then disappear entirely (*-a^{ʔ}k > -aʔ > -a). On the other hand, the velum may be lowered to release the pre-ploded nasal (*-a^{ʔ}k > *-ak^{ŋ} > -aŋ). The former type of development (loss of ending) is commonly found in several languages of the area. The latter type has been less well-known, yet we have noticed such development in a few Northern Mon-Khmer languages such as Bugan (Yunnan, China) and Darang (Chiangmai, Thailand).

		Laozhai	Qiaoshang	Wanzi
1. bone	D2	dæ	tɒ	taŋ
2. deep	D2	ʑi	lɒ	laŋ
3. hear	D2	---	---	tsaŋ

* Buyang 2. lak D1. Laha: 1. dak 2. lak D1 3. jak.

*4.23.3. *-aat*

This rime has regularly become -ɑ, -e and -ɒ in Laozhai, Qiaoshang and Wanzi respectively. Extra-Gelao comparisons show that this rime came from the merger of original *-aat and *-aap.

		Laozhai	Qiaoshang	Wanzi
1. blood	D1	plɑ	ple	plɒ
2. sour	D2	---	vle	vlɒ
3. bathe	D1	ʔjɑ	---	ɒ
4. handspan	D1	---	---	xɒ

* Buyang: 4. kaap. Laha: 1. plaat 3. ʔaap.

*4.2.3.4. *-aak*

Laozhai has merged this rime with *-aat (in parallel with its merger of *-ak with *-at). Qiaoshang, on the other hand, has merged this rime with its short counterpart *-ak. Wanzi normally has the reflex -ei, which became -i after retroflexed initials (#4).

		Laozhai	Qiaoshang	Wanzi
1. child	D2	lɑ	lɒ	lei
2. rope	D1	sɑ	sɒ	tshei
3. fruit	D2	mɑ	---	mei
4. give	D2	---	zɒ	ni -v

* Buyang: 2. caak D2 3. maak D1 4. naak.

*4.2.3.5. *-ut*

This rime has merged with *-at and become -æ and -e in Laozhai and Anshun respectively. But Qiaoshang shows the reflex -o for this rime, contrasting with -ɒ for *-at.

Qiaoshang shows the variant -en in a few forms (#3-4); these we consider to have developed from the early merger of *-ut with *-iK (-en is the normal reflex of *-iK in Qiaoshang, cf. 4.2.3.9). For 'tail' (#4), the reflex was probably fronted from *-ut > *-it after PG prepalatal initial (*tʃ-). For 'lazy' (#3), the change was due to the dissimilation with rounded medial -w- (similar to the dissimilation of -ɒ > -a after -w- in the *-at rime).

Wanzi also shows a variant reflex -an in certain forms. The development is similar that of *-ak > -aŋ, presumably through preploded nasal (*-ut > -ə$^{?}$t > -at^{n} > -an). The variants -e and -an probably branched off at the stage of *-ə$^{?}$t. The unrelaesed -$^{?}$t may have become -$^{?}$ and then lost (-ə$^{?}$t > -e$^{?}$ > -e); with ploded nasal, -ə$^{?}$t became -at^{n} and then -an. The conditions which determined the variant developments are unclear, but a few examples with nasal variant seem to show sibilant initials.

		Laozhai	Qiaoshang	Wanzi
1. fart	D1	tæ	tʂo	(tsɑn)
2. ten	D1	---	vlo	pe
3. lazy	D1	ʔlæ	kwen	kle
4. tail	D1	tʂæ	tsen	tshan

Notes

1. The parenthesized form is from Dagouchang variety.

* Buyang: 1. tut 2. put 4. cut D2.

*4.2.3.6. *-uk*

This rime has regularly become -i, -au and -au in Laozhai, Qiaoshang and Wanzi respectively.

		Laozhai	Qiaoshang	Wanzi
1. bird	D2	ni	zau	ntau
2. fall	D1	ti	tau	tau
3. itchy	D2	---	---	tau

* Buyang: 2. tuk 3. ʔduk D1.

*4.2.3.7. *-uut*

There do not appear to be examples we may cite with confidence for this rime. The only example provided below is suggested on the basis of the possibly related extra-Gelao form indicating early *-uut. The Qiaoshang and Wanzi reflexes may simply point to *-uuk.

		Laozhai	Qiaoshang	Wanzi
1. take off	D1	---	kwe	klu

* Buyang: 1. θɔɔt.

*4.2.3.8. *-uuk*

This rime has become -au, -e and -u in Laozhai, Qiaoshang and Wanzi respectively.

		Laozhai	Qiaoshang	Wanzi
brain	D1	ʔau	---	u
white	D1	ʔau	ʐe	zu
hat	D1	hau	---	hu
fog	D2	---	---	mpu

* Buyang: 2. ʔɔɔk 4. muok.

*4.2.3.9. *-iK*

This rime has merged with *-at and *-ut in Laozhai. It is possible to specify the rime *-iK as *-it in this variety, since we will then be able to assume that Laozhai has merged together all three short vowels with alveolar endings (*-at, *-ut and *-it), probably through *-ət. This also appears to be the case in Wanzi. Qiaoshang has developed final nasalization for this rime.

		Laozhai	Qiaoshang	Wanzi
1. raw	D2	dæ	zen	te
2. fingernail	D1	ʔlæ	---	kle

* Buyang: 1. ʔdip D1 2. lip D2.

*4.2.3.10. *-iiK*

This rime has become -i, -ai and -ei in Laozhai, Qiaoshang and Wanzi respectively. The Wanzi reflex is the same as that of *-aak.

	Proto-Gelao	Laozhai	Qiaoshang	Wanzi
full	D1	tɕi	tai	tei
deer	D2	dʑi	---	---

* Buyang: 1. tiak. Pubiao: 2. ?diet D1.

4.3.3.11 Summary of stopped rime correspondences

	Laozhai	Qiaoshang	Wanzi
*-at	-æ	-ɒ	-e
*-ak	-æ	-ɒ	-aŋ
*-aat	-ɑ	-e	-ɒ
*-aak	-ɑ	-ɒ	-ei
*-ut	-æ	-o	-e
*-uk	-i	-au	-au
*-uut (?)	---	-e	-u
*-uuk	-au	-e	-u
*-iK	-æ	-en	-e
*-iiK	-i	-ai	-ei

(Variants are not listed in the summary table).

4.2.4. Summary of PG rimes

Open rimes

Monophthongs			Diphthongs		
i		u	ai	aɯ	au
e	ə	o			
	a				

Nasal rimes

iiN		**uun/uuŋ**
iN	**an/aŋ**	**un/uŋ**
	aan/aaŋ	

Stopped rimes

iiK		**uut/uuk**
iK	**at/ak**	**ut/uk**
	aat/aak	

CHAPTER 5

WESTERN-KRA AND SOUTHWESTERN-KRA

In this chapter, we will put Lachi and Laha languages in comparison with Proto-Gelao. The sound systems of Proto-Western-Kra and Proto-Southwestern-Kra, as well as their development to modern Lachi and Laha languages, will be presented in sections 5.1 - 5.3 and 5.4 - 5.6 respectively.

5.1. Lachi and Proto-Western-Kra

Lachi reflexes have hardly added any changes to the system of initials and rimes reconstructible for Proto-Gelao, which therefore can be generally projected back to Proto-Western-Kra (PWK). In the following two sections, we will be essentially summarizing the development of Lachi from the proto-language with respect to its initials (5.2) and rimes (5.3).

5.2. Lachi and PWK initials

5.2.1. Simple initials.

The development of simple initials from PWK to Lachi is fairly straightforward. The following main changes may be summarized for simple initials:

1. The retroflexed series merged with the alveolar series, i.e. *t- and *ʈ- merged etc. 2. The prepalatal affricates (*tʃ- and *dʒ-) have been deaffricated; the former has become an alveolar fricative (*tʃ- > ʃ- > s-) while the latter has become a palatal fricative (dʒ- > z-). 4. The voiceless sonorants have merged with their voiced counterparts, but their early voicing contrast is indirectly preserved by the separate tonal series. 5. *l- and *r- merged into l-; and *w- and *v- merged into v-.

In the following figures, we also provide as references the sections and item numbers where the related Gelao forms discussed in the last chapter may be found.

PWK	Lachi	Examples		Gloss	References
*p-	p-	pje	A1	fire	4.1.1.1 #2
*t-	t-	tje	B1	ash	4.1.1.1 #6
*ʈ-	t-	tã	A1	egg	4.1.4.1 #2
*k-	k-	kwɛ	B1	old	4.1.1.1 #10
*ʔ-	ʔ-	ʔi̱	C1	water	4.1.1.1 #15
*b-	pfi-	pfiu	B2	shoulder	---
*d-	tfi-	tfije	A2	do	4.1.1.2 #4
*ɖ-	tfi-	tfijẹ	D2	raw	4.1.4.1 #5
*dz-	tfi-	tfijo	B2	chopsticks	4.1.2.2 #4
*s-	s-	su	A1	two	---
*ʃ-	s-	so	D1	rope	4.1.2.1 #6
*tʃ-	s-	sɛ	B1	satisfied	4.1.2.1 #7
*ts-	tɕ-	tɕĩ	A1	buy	4.1.2.1 #3
*tʂ-	tɕ-	tɕe	A1	teach	4.1.4.1 #6
*ʒ-	z-	zfio	B2	y brother	4.1.2.2 #5
*dʒ-	z-	zi̱	C2	son-in-law	4.1.2.2 #8
*ʒ-	z-	zu̱	C2	grandmother	4.1.2.2 #9
*dʐ-	tɕfi-	tɕfii	A2	mountain	4.1.4.1 #8
*m-	m-	m̩	A2	hand	4.1.3.1 #1
*(ʔ)n-	n-	nfijã	A2	six	4.1.3.2 #4
*ɳ-	n-	njọ	D2	bird	4.1.4.2 #2
*ɳ̊-	ɳ-	ɳfiũ	A2	salt	4.1.3.1 #9

*ŋ-	ŋ-	ŋ	A2	snake	4.1.3.1 #11
*hm-	m-	mą	D1	flea	4.1.3.2 #3
*hŋ-	ŋ-	ŋ	A1	door	4.1.3.2 #9
*hl-	l-	lje	C1	heart	4.1.3.2 #12
*l-	l-	lfiyọ	D2	deep	4.1.3.1 #15
*l̥-	l-	ljụ	C2	near	4.1.4.2 #6
*r-	l-	lu	A2	ear	4.1.4.2 #10
*v-	v-	vu	C2	go	4.1.5 #2
*w-	v-	vfiõ	A2	sun	4.1.5 #4

Notes

1. The alveolar fricative (s-) may become palatalized (ɕ-). The following examples show reflexes of the rime *-o, which has first become Lachi -ju after alveolar initials (cf. 5.3.1.5); and thus *so > sju > ɕu.

*s-	s- > ɕ-	ɕu	A1	laugh
*s-	s- > ɕ-	ɕu	A1	know

Some Lachi varieties have further developed labialization of s- (> f-) before -u- (both modern and original):

	Jinchang	Ban Phung	PWK
tooth	sei A1	fei	*tʃuuŋ
tail	sɛ̨ D1S	fɛ	*tʃut
two	su A1	fu	*sa

2. The modern palatal spirant may be nasalized (ʑ- > ɳʑ-) in certain environment. The nasality may be spread from the vowel (which was in turn nasalized by PWK nasal endings):

rain	A2	ɳʑã	cf. Laha /jal/, Paha /jin/

Or, sometimes, the nasalization may spread from the preceding syllable:

tear (n.)	C2	(ʔi) ɳʑiũ	cf. Gelao /ji/ (Lz)
neck	A2	(lja ŋ̩) ɳʑiũ	cf. Laha /ju/, Paha /juɯ/

The first morpheme of the former example means 'water' (< *ʔuuŋ C2). The preceding syllabic nasal of the latter example is prefixed to a number of body parts, e.g. /lja ŋ̩ kɛ/ 'throat', /lja ŋ̩ ku/ 'leg', /lja ŋ̩ lje/ 'heart', /lja ŋ̩ tju/ 'eye', etc.

5.2.2. Complex initials.

The major development of the complex initials from the proto-stage to Lachi may be summarized as follows:

1. Medials -l- and -r- have usually become Lachi -j- after labials. This palatal -j- is further lost before front vowels. 2. The medial -r- after voiceless grave initials (*pr- and *kr-) also induced aspiration, e.g. *pr- becomes *phj-. 3. Alveolar and velar clusters with -l- (*tl- and *kl-) have merged and become l- (with tone series 1, probably through *ʔl-). Modern Lachi -j- in certain examples is not part of the initial reflex, but is the regular epenthetic onglide of certain rime reflexes (e.g. 'waist' which goes back to rime *-u, cf. 5.3.1.4). 4. Other complex initials often simply lost the medials.

PWK	Lachi	Examples		Gloss	References
*pl-	p-	pjo	D1	blood	4.1.6.1 #1
*pwl-	p-	pɛ	D1	ten	4.1.6.1 #9
*pr-	ph-	phjo	B1	silver	4.1.6.1 #8
*pwr-	ph-	phī	A1	die	4.1.6.1 #11

*bl-	pfi-	pfii	D2	carry on back	blæ D2 (Lz)
*tl-	l-	ljɐ	C1	waist	4.1.6.1 #32
*kl-	l-	lɛ	D1	fingernail	4.1.6.1 #16
*kr-	kh-	kho	A1	house	4.1.6.1 #17
*tr-	t-	tǫ	C1	nest	4.1.6.1 #33
*dr-	tfi-	tfijã	A2	body louse	4.1.6.2 #3
*kw-	k-	kwɛ	A1	horn	4.1.6.1 #21
*kj-	k-	kɐi̯	C1	iron	4.1.6.1 #26
*kɜ-	k-	ku	B1	dry	4.1.6.1 #27
*gj-	kfi-	kfiu	C2	skinny	4.1.6.2 #4
*ml-	m-	m̩	A2	five	4.1.6.3 #1
*mr-	m-	mfiei	A2	ghost	4.1.6.3 #4
*hŋj-	n̥-	n̥a	D1	nose	4.1.6.3 #8
*vj-	v-	vei	A2	tall	4.1.6.4 #1
*wj-	v-	vɔ̃	A2	tendon	4.1.6.4 #4

Note: There are a few instances where Lachi shows velar initial with slight offglide (kfiɣ-) for PG *r-.

PG	Lachi	Examples		Glosses	PWK
*r-	kfiɣ-	kfiɣe	C2	sick	*k-r-
*r-	kfiɣ-	kfiɣei	C2	ribs	*k-r-

For these examples, Laha also shows velar onset: khəi 'sick' (*-r- lost before -ə-) and khlaŋ 'ribs', suggesting PSWK *k-r- (see 5.5.2.2).

5.3. Lachi and PWK Rimes

The rime system of Proto-Western-Kra is essentially the same as that of Proto-Gelao. For each rime, Lachi often shows variant reflexes conditioned by initials. It is thus necessary to include a number of examples for certain rimes in order to explain their conditioned variants and to justify that these variants do not constitute evidence for separate rimes at the proto-level. Since certain subtle variations are affected by early distinctions of proto initials which may not have been kept in modern Lachi, we will also provide as reference the PWK initials for each example.

5.3.1. Open rimes

*5.3.1.1. *-a*

This rime has become Lachi -u. After alveolar initials (non-sibilants), the short palatal offglide -j- is developed. After grave nasal onsets (m- and ŋ-), the vowel further dropped and the initials become syllabic nasals.

PWK		Lachi	Gloss	Reference
*p-	B1	pu	bran	4.2.1.1 #13
*k-	A1	ku	cogon	4.2.1.1 #12
*s-	A1	su	two	---
*ʈ-	A1	tju	eye	4.2.1.1 #1
*ɳ-	A2	nju	thick	4.2.1.1 #2
*m-	A2	m̩	hand	4.2.1.1 #7
*ŋ-	A2	ŋ̩	snake	4.2.1.1 #8

*5.3.1.2. *-i*

This rime has become Lachi -je, which is lowered to -ɛ after back consonants. Alveolar sibilants (*s- and *ts-) have become palatalized before the reflex -je, and in turn

brought the rime back to -i (e.g. *si > sje > ce > ci). (Cf. the similar palatalization of the alveolar sibilant under *-o, 5.3.1.5).

PWK		Lachi	Gloss	Reference
*t-	A1	tje	tree	---
*d-	A2	tfije	tiger	---
*l-	A2	lje	far	4.2.1.2 #4
*s-	C1	ci	intestine	4.2.1.2 #5
*ts-	C1	tci	ask	4.2.1.2 #8
*tʃ-	B1	sɛ	satisfied	4.2.1.2 #6
*k-	A1	kɛ	chicken	4.2.1.2 #10

*5.3.1.3. *-e*

This rime has become -o (with epenthetic -j- after alveolars), with lower variant -ɒ after non-breathy labials. (In narrow transcriptions, there is always a non-contrastive offglide -w- before the low back vowel -ɒ. E.g. /pɒ/ = [p^{w}ɒ]).

PWK		Lachi	Gloss	Reference
*ml-	A2	mɒ	frost	4.2.1.3 #9
*p-	A1	pɒ	seed	4.2.1.3 #3
*l-	C2	lfijo	wear	---
*m-	C2	mfio	goat	---

*5.3.1.4. *-u*

This rime has in general merged with *-i and become -je. It shows variants -i after modern palatals and -ɛ after velar stops. The latter variant -ɛ occurs with epenthetic -w- after the initial, and thus shows a subtle distinction between *-u and *-i (contrast, for

example, /kwɛ B1/ 'old', from *-u, with /kɛ A1/ 'chicken', from *-i). Early velar nasals, on the other hand, have been palatalized by the rime -je and in turn raised the reflex into -i (e.g. *ŋu > ŋje > ɳe > ɳi). (Cf. the parallel development of alveolar sibilants before *-i).

PWK		Lachi	Gloss	Reference
*t-	B1	tje	ash	4.2.1.4 #1
*tl-	C1	lje	waist	4.2.1.4 #6
*hm-	A1	mje	pig	4.2.1.4 #7
*kw-	A1	kwɛ	horn	4.2.1.4 #3
*k-	B1	kwɛ	old	4.2.1.4 #2
*k-	C1	kwɛ̨	wild cat	---
*tʂ-	A1	tɕi	pillar	4.2.1.4 #13
*dʐ-	A2	tɕɦi	mountain	4.2.1.4 #12
*dʒ-	C2	ʑi	son-in-law	4.2.1.4 #5
*hŋ-	B1	ɳi	ripe	4.2.1.4 #10
*ŋ-	B2	ɳɦi	sleep	---
*m-	B2	mɦiī	smelly	4.2.1.4 #9

Note: The last example, /mɦiī/ 'smelly', shows vowel raising by breathiness (contrast with /mje/ 'pig'). Cf. the similar contrast in the previous section between /mɦio/ 'goat' and /mɒ/ 'frost'.

*5.3.1.5. *-o*

This rime has become Lachi -ju. The alveolar sibilants were similarly palatalized by this -ju reflex as they were by the -je reflex of the rime *-i (e.g. *so > sju > cu). (Contrast this with rime *-a, where s- is not palatalized: *sa > su). The vowel further dropped after the velar nasal, which became syllabic (cf. the similar change under *-a).

PWK		Lachi	Gloss	Reference
*l-	A2	lfijũ	take by force	4.2.1.5. #4
*s-	A1	cu	laugh	4.2.1.5 #1
*s-	A1	cu	know	4.2.1.5 #2
*hŋ-	A1	ŋ	door	4.2.1.5 #3

*5.3.1.6. *-ə*

This rime has merged with *-a and become Lachi -u. Similar loss of the vowel after grave nasal initials, which then become syllabic, also applied.

PWK		Lachi	Gloss	Reference
*p-	A1	pu	four	4.2.1.6 #4
*m-	C1	ʔm̩	you	4.2.1.6 #3

*5.3.1.7. *-au*

This rime has regularly become -o (merging with *-au). This back vowel -o, like -u, has also been lost after grave nasal initials, but the remaining syllabic nasal appears to be pronounced with relatively longer duration than the one before the dropped -u (contrast the last example /m̩m/ 'rice' with /ʔm̩/ 'you' in the previous section).

PWK		Lachi	Gloss	Reference
*ɖ-	A2	tʃijo	navel	4.2.1.7 #1
*ʒ-	B2	ʒʃio	younger brother	4.2.1.7 #2
*dz-	C2	tʃijo	chopsticks	4.2.1.7 #5
*p-	C1	pǫ	male	4.2.1.7 #6
*m-	C2	m̩m	rice	4.2.1.7 #7

*5.3.1.8. *-ai*

This rime has become Lachi -ja. The epenthetic -j- is not found after back consonants (cf. *-i).

PWK		Lachi	Gloss	Reference
*m-	C2	mʃija	female	4.2.1.8 #1
*hl-	C1	lja	rat	4.2.1.8 #3
*t-	A1	tja	elder brother	---
*k-	C1	kạ	excrement	4.2.1.8 #5
*ʔ-	A1	ʔa	good	4.2.1.8 #4

*5.3.1.9. *-au*

This rime has merged with *-aɯ and become Lachi -o.

PWK		Lachi	Gloss	Reference
*ʔ-	C1	ʔǫ	meat	4.2.1.9 #1
*tr-	C1	tǫ	nest	4.2.1.9 #2
*tr-	C1	tǫ	sprout (v.)	4.2.1.9 #3

5.3.1.10. Summary of Lachi open rime reflexes

PWK		Lachi	variants
*-i, *-u	>	-i	-i, -je, -(w)ɛ
*-o, *-a, *-ə	>	-u	-(j)u
*-e	>	-o	-(j)o, -ɒ
*-aɯ, *au	>	-o	-(j)o
*-ai	>	-a	-(j)a

The monophthongs seem to go in a series of counter-clockwise shufflings. The high back vowel *-u has generally merged with *-i (a subtle distinction between them may be found in certain conditioned variants). The non-high back and central vowels *-a, *-ə and *-o then slid up to -u (again, with certain distinctions amidst their conditioned variants). And the mid front vowel *-e then moved to -o. Diphthongs were monophthongized: *-aɯ and *-au have become -o, while *-ai has become -a.

5.3.2. Nasal rimes

The nasal finals have been kept in Lachi as vowel nasalization after early short vowels; after early long vowels they have been lost without trace. The two early endings, *-n and *-ŋ, are distinguished in modern Lachi as different vowel qualities.

*5.3.2.1. *-an*

This rime has become Lachi -ã, whose nasalization was dissimilated when following nasal initials. After alveolar initials, an epenthetic -j- is added before the vowel.

PWK		Lachi	Gloss	Reference
*k-	C1	kã̠	hatch	4.2.2.1 #5
*p-	A1	pã	dream	4.2.2.1 #14

*t-	C1	tjã	plant (v.)	4.2.2.1 #3
*m-	A2	mfia	yam	---
*n-	A2	nfija	six	4.2.2.1 #6

*5.3.2.2. *-aŋ*

This rime has become Lachi -ɔ̃. The change from *-a- > -ɒ- must have been influenced by the early velar ending before it was lost (i.e. *-aŋ > -ɒŋ > -ɔ̃, in contrast with *-an > -ã).

PWK		Lachi	Gloss	Reference
*pl-	A1	pɔ̃	peach	4.2.2.2 #3
*t-	B1	tjɔ̃	cook (v.)	4.2.2.2 #1
*ɖ-	A2	tfijɔ̃	crow (v.)	4.2.2.2 #3

*5.3.2.3. *-aan*

This rime has become Lachi -o, which was further raised to -u after labials (including labio-velar -w-). The nasal ending has been entirely lost after long vowels in general.

PWK		Lachi	Gloss	Reference
*m-	A2	mu	new	4.2.2.3 #1
*kw-	A1	ku	ax	4.2.2.3 #6
*kr-	A1	kho	house	4.2.2.3 #8
*ŋj-	C2	ŋfio	thorn	4.2.2.3 #2

*5.3.2.4. *-aaŋ*

This rime has become Lachi -ei or -i after grave or acute initials respectively.

PWK		Lachi	Gloss	Reference
*vj-	A2	vei	tall	4.2.2.4 #1
*mr-	A2	mɦei	ghost	4.2.2.4 #7
*dʒ-	A2	ʑi	mosquito	4.2.2.4 #5
*l̥-	C2	li	hawk	4.2.2.4 #3

*5.3.2.5. *-un*

This rime has become Lachi -ĩ. The vowel probably first became fronted by the acute ending (i.e. *-un > -in > -ĩ). Contrast this with the next rime (*-uŋ > -ũ)) where *-u- remains as such before the early velar ending. A similar change, though in the opposite direction, has been noted for *-a-, where the vowel has remained -a- before the alveolar ending *-n but has become backed to -ɒ before velar *-ŋ.

PWK		Lachi	Gloss	Reference
*kr-	A1	khĩ	road	4.2.2.5 #1
*pwr-	A1	phĩ	die	4.2.2.5 #3
*ts-	A1	tɕĩ	buy	4.2.2.5 #5

*5.3.2.6. *-uŋ*

PWK		Lachi	Gloss	Reference
*l-	A2	lɦũ	vegetable	4.2.2.6 #5

*5.3.2.7. *-uun*

This rime has become Lachi -e. Palatal onglides -j- and -w- develop after alveolar and velar initials respectively.

PWK		Lachi	Gloss	Reference
*tʂ-	A1	tɕe	teach	4.2.2.7 #2
*hl-	A1	lje	heart	4.2.2.7 #3
*k-	A1	kwe	front/before	4.2.2.7 #1

*5.3.2.8. *-uuŋ*

This rime has become Lachi -i and sometimes -ei. The condition for the latter variant is unclear since only one example is found.

PWK		Lachi	Gloss	Reference
*ʔ-	C1	ʔi̯	water	4.2.2.8 #1
*l̥-	A2	li	drum	4.2.2.8 #4
*l̥-	A2	lei	star	4.2.2.8 #5

*5.3.2.9. *-iN*

This rime has regularly become Lachi -ī (parallel with *-uŋ > -ū).

PWK		Lachi	Gloss	Reference
*l-	C2	lfiī	steal	4.2.2.9 #2
*k-	A1	kwī	hold in mouth	4.2.2.9 #7
*t-	C1	tī̯	pound (v.)	4.2.2.9 #3
*d̥(j)-	C2	tfiī	shallow	4.2.2.9 #5

*5.3.2.10. *iiN*

The reflex shows the expected complete loss of nasal ending after long vowel, contrasting with that of the previous short rime counterpart.

PWK		Lachi	Gloss	Reference
*t-	A1	ti	cucumber	4.2.2.10 #3
*pwr-	A1	pfii A2	year	4.2.2.10 #2

5.3.2.11. Summary of nasal rimes

Early short vowels		Lachi	Early long vowels	Lachi
*-an		-ã	*-aan	-o
*-aŋ	(> -ɒŋ)	-õ	*-aaŋ	-i
*-un	(> -in)	-ĩ	*-uun	-e
*-uŋ		-ũ	*-uuŋ	-i
*-iN		-ĩ	*-iiN	-i

5.3.3. Checked rimes

The development of checked rimes is parallel with that of nasal rimes. The final stops have left their trace as vowel constriction after early short vowels, while being lost completely after early long vowels. Interestingly, the reflexes of high short vowels (-ɛ̰, -o̰ and -ɛ̰ for *-ut, *-uk and *-iK respectively) are lower than those of their nasal counterparts (-ĩ, -ũ and -ĩ for *-un, *-uŋ and *-iN respectively). This vowel lowering is clearly caused by constricted glottis.

*5.3.3.1. *-at*

PWK		Lachi	Gloss	Reference
*t-	D1S	tja̰	liver	4.2.3.1 #2
*d-	D2S	tfija̰	forget	4.2.3.1 #3
*hm-	D1S	ma̰	flea	4.2.3.1 #4

*5.3.3.2. *-ak*

PWK		Lachi	Gloss	Reference
*l-	D2S	lɦjɒ	deep	4.2.3.2 #1
*d-	D2S	tɦjɒ	bone	4.2.3.2 #2
*(d)ʒ-	D2S	jɦɒ	hear	4.2.3.2 #3

*5.3.3.3. *-aat*

PWK		Lachi	Gloss	Reference
*pl-	D1L	pjo	blood	4.2.3.3 #1
*k-	D1L	ko	handspan	---

*5.3.3.4. *-aak*

PWK		Lachi	Gloss	Reference
*m-	D2L	mɦiī	fruit	4.2.3.4 #3
*l-	D2L	lɦi	child	4.2.3.4 #1

Note: The nasalization of the vowel reflex ('fruit') was spread from the breathy nasal initial. Cf. 5.3.2.1 *-an for the opposite development where the nasalization was dissimilated after nasal initial.

*5.3.3.5. *-ut*

PWK		Lachi	Gloss	Reference
*pwl-	D1S	pɛ	ten	4.2.3.5 #2
*tʃ-	D1S	sɛ	tail	4.2.3.5 #4

*5.3.3.6. *-uk*

PWK		Lachi	Gloss	Reference
*ɳ-	D2S	njǫ	bird	4.2.3.6 #1
*t-	D1S	tjǫ	fall (v.)	4.2.3.6 #2

*5.3.3.7. *uut*

PWK		Lachi	Gloss	Reference
*kl-	D1L	lja	take off	4.2.3.7 #1

*5.3.3.8. *-uuk*

PWK		Lachi	Gloss	Reference
*ʔ-	D1L	ʔi	white	4.2.3.8 #2

*5.3.3.9. *-iK*

PWK		Lachi	Gloss	Reference
*ɖ-	D2S	tfijɐ̭	raw	4.2.3.9 #1
*kl-	D1S	lɐ̭	fingernail	4.2.3.9 #2

Note: This rime has become -ɐ̭ (merging with that of *-ut). A higher variant -ɐ̭ is found after breathy initials. (Cf. the similar examples of vowel raising by breathiness in rimes *-u and *-e).

*5.3.3.10. *iiK*

PWK		Lachi	Gloss	Reference
*t-	D1L	tfii D2	full	4.2.3.10 #1

5.3.3.11. Summary of checked rimes

Early short vowels	Lachi	Early long vowels	Lachi
*-at	-a̱	*-aat	-o
*-ak	-ɒ̱	*-aak	-i
*-ut	-ɛ̱	*-uut	-a (?)
*-uk	-ɔ̱	*-uuk	-i
*-iK	-ɛ̱	*-iiK	-i

5.4. Laha and Proto-Southwestern-Kra

There are some major changes in the systems of initials and rimes at the Proto-Southwestern-Kra (PSWK) level. Monosyllabic clusters versus sesquisyllabic pre-initial plus medial have to be distinguished, e.g. *kl- vs *k-l- and *kr- vs *k-r-. Labial nasal and stop finals (*-m and *-p) are reconstructible, in addition to PWK alveolars (*-n and *-t) and velars (*-ŋ and *-k). Also, a liquid final (*-l) has to be posited at this proto stage.

5.5. Laha and PSWK onsets

5.5.1. Simple onsets

5.5.1.1. Voiceless stops

Proto-Southwestern-Kra	Proto-Western-Kra	Laha
*p-	*p-	p-
*t-	*t-	t-
*k-	*k-	k-
*ʔ-	*ʔ-	ʔ-

		Laha	Gelao	Lachi	
*p-	A1	pəi	pai	pje	fire

*t-	D1	tok	tau	tjo̱	fall (v.)
*k-	A1	kam	qan	kã	bitter
*ʔ-	A1	ʔai	ʔɒ	ʔa	good

5.5.1.2. Voiced Stops

Proto-Southwestern-Kra	Proto-Western-Kra	Laha
*b-	*b-	b-
*d-	*d-	d-

		Laha	Gelao	Lachi	
*b-	B2	baa	---	pfiu	shoulder
*d-	D2	dak	taŋ	tfijo̱	bone
*d-	D2	dap	te	tfija̱	foget

Note: These initials have been devoiced in Ta Mit variety into /ph-/ and /th-/ respectively, e.g. Ta Mit /thap/ 'forget'. The development in Ta Mit is similar to that found in some Lachi varieties, i.e. the initial has first become breathy and then voiceless aspirated (*d- > tfi- > th-). Words with these initials have series 2 tones, indicating a voiced origin.

5.5.1.3. Voiceless Sibilants

Proto-Southwestern-Kra	Proto-Western-Kra	Laha
*s-	*s-	s-
*ts-	*ts-	c-
*tʃ-	*tʃ-	c-
*c-	*c-	c-

		Laha	Gelao	Lachi	
*s-	A1	sɔ	sa	ɕu	laugh
*ts-	A1	col	sen	tɕĩ	buy
*tʃ-	D1	cot	tshan	sɛ̰	tail
*c-	C1	cau	tsəɯ	---	descend

Note: Laha has contrastive fricative and affricate s- and c-. However, while the Nong Lay variety merged *tʃ- with alveolar affricate *ts-, the Ta Mit variety merged it with fricative *s- instead. For the above examples, Ta Mit shows /so/ 'laugh', /tɕum/ 'buy, but /sʏt/ 'tail'.

5.5.1.4. Voiced Sibilants

Proto-Southwestern-Kra	Proto-Western-Kra	Laha
*ʒ-	*ʒ-	j-
*dʒ-	*dʒ-	j-
*ɟ-	*ɟ-	j-

		Laha	Gelao	Lachi	
*ʒ-	B2	jau	tsəɯ	ʑo	younger brother
*dʒ-	A2	(m)jaaŋ B2	tɕhi	ʑi	mosquito
*ɟ-	C2	jaa B1	ʑɒ	ʑu̱	grandmother

Note: Ta Mit appears to adopt a change j- > z-, cf. /za C2/ 'grandmother'.

5.5.1.5. Sonorants

Proto-Southwestern-Kra	Proto-Western-Kra	Laha
*m-	*m-	m-

*n-	*n-	n-
*ɳ-	*ɳ-	ɳ-
*ŋ-	*ŋ-	ŋ-
*l-	*l-	l-

		Laha	Gelao	Lachi	
*m-	A2	maa	mpau	m̩	hand
*n-	A2	nəi	ntai	nĩ A1	cow
*ɳ-	A2	ɳɔ	ɳtɕəɯ	ɳfiũ	salt
*ŋ-	A2	ŋaa	ŋkau	ŋ	snake
*l-	C2	lɛ	lai	lfijo	wear

All forms in the above set have series 2 tones, indicating voiced sonorants. For what is reconstructed as PWK voiceless sonorants, Laha shows the same plain sonorant reflexes, usually with tonal series 1. Exceptions seem to abound with the PWK voiceless velar nasal (*hŋ-), which at times shows Laha tone series 2 instead, as if indicating the early loss of voicelessness at this position of articulation.

PWK		Laha	Gelao	Lachi	
*hm-	A1	maa	mpau	m̩	dog
*ʔn-	A1	dam (Tm)	nam	nfija A2	six
*hɳ-	C1	ɳaan	ɳø (Qs)	---	short (≠ Long)
*hŋ-	A1	ŋaa A2	ŋkau	---	wait
*hŋ-	D1	ŋat D2	ɳtɕe	ɳa	nose
*hŋ-	A1	ŋai	---	ɳa	sand
*hŋj-	B1	ɳəu	ŋka	ɳi	ripe
*hl-	C1	lul	ləɯ	lje	heart

Ta Mit variety has distinctive stop reflexes for PWK voiceless nasals, while it simply shows plain l- for the earlier voiceless liquid. For example, /ba/ 'dog' and /laai/ 'rat'.

There is a possiblity that the nasal initials in a number of these latter forms were glottalized in early Laha. The reasons are two-fold. First, Ta Mit has the stop reflex /d-/ for what is reconstructible as *kl- (5.5.2.1), e.g. Nong Lay /klaal/ Ta mit /daan/ 'grandchild', Nong Lay /klap/ Ta Mit /dap/ 'close eye'. This Ta Mit /d-/ is accompanied by tone series 1, suggesting that the initial was previously glottalized (*kl- > ʔd- > d-. The glottalized feature is also transcribed in the source in some forms, e.g. Nong Lay /kliŋ B1/ Ta Mit /ʔdiŋ C1/ 'black'). This contrasts with the reflex of the early voiceless lateral (*hl-) which has simply become Ta Mit plain l-.

A parallel development may be assumed for nasals, where early glottalized nasals have become Ta Mit stops, i.e. *ʔm- > ʔb- > b- (e.g. 'dog') and *ʔn- > ʔd- > d- (e.g. 'six'), while voiceless nasals simply become plain nasals ('sand' Ta Mit /n̥aai A1/ Lachi /n̥a A1/). Also, this is consonant with the second reason, i.e. that the Nong Lay variety shows tone A1 (usually indicating early plain voiceless initials) for the hypothesized glottalized nasals but tone A1' (usually indicating early voiceless aspirated and fricative initials) for the voiceless nasals. For example, Nong Lay /ma A1/, but /ŋai A1'/. Nong Lay also shows tone A1' for voiceless lateral (*hl-), e.g. /loŋ A1'/ 'stomach'.

As a matter of fact, at the PSWK level, there appear to be very few etyma which can be reconstructed simply as voiceless nasals. All three good PG/PWK etymologies reconstructed with initial *hm- correspond to those in early Laha with *ʔm-. Already at the Proto-Gelao level, these roots suggest the possibility of reconstructing velar presyllable plus labial nasal of the sort *x-m- (4.1.3.2). Also, the only non-voiced alveolar nasal reconstructible for PG/PWK is glottalized *ʔn- ('six'), which can be projected back to the PSWK stage. Without further evidence to the contrary, we may have to temporarily take PG/PWK voiceless nasals *hn̥- and *hŋ- as valid for Proto-

Southwestern-Kra, though some of them may potentially go back to sesquisyllable structures.

5.5.1.6. Retroflexes

The retroflex series have merged with their alveolar counterparts.

Proto-Southwestern-Kra	Proto-Western-Kra	Laha
*ʈ-	*ʈ-	t-
*ɖ-	*ɖ-	d-
*tʂ-	*tʂ-	c-
*ɳ-	*ɳ-	n-

		Laha	Gelao	Lachi	
*ʈ-	A1	taa	tau	tju	eye
*ɖ-	A2	daŋ	thaŋ	thjõ	crow (v.)
*tʂ-	A1	cou B2	sa	tɕi	pillar
*ɳ-	D2	nok	ntau	njo	bird

5.5.1.7. Spirants

Proto-Southwestern-Kra	Proto-Western-Kra	Laha
*w-	*w-	v-
*v-	*v-	v-

		Laha	Gelao	Lachi	
*w-	A2	van	ven	vɔ̃	tendon
*v-	C2	vaa	vu	vu	go

5.5.2. Complex onsets

5.5.2.1. Clusters with stops as the first member.

With medial -l-: *pl- remains Laha pl-, while *tl- merged with *kl-.

Proto-Southwestern-Kra	Proto-Western-Kra	Laha
*pl-	*pl-	pl-
*tl-	*tl-	kl-
*kl-	*kl-	kl-

		Laha	Gelao	Lachi	
*pl-	D1	plaat	plɒ	pjo	blood
*pwl-	D1	pʏt (Tm)	pe	pɛ	ten
*tl-	A1	kləi	klai	lje	flow
*kl-	D1	kləp	kle	lɛ	fingernail
*kl-	D1	klap	kle	---	close eye

Note: The Ta Mit variety usually lost medial -l- after labials, i.e. *pl- > p-, while *tl- and *kl- merged and become d-. For the above examples Ta Mit has the following forms: /pat/ 'blood', /dəi/ 'flow' and /dap/ 'close eye'.

With medials -r-/-ʒ-: Medial -r- has induced aspiration, and *p(w)r- and *kr- become Laha phl- and khl- respectively. Before back vowels the medial -r- was usually lost and the velar initial was backed to glottal. For example, 'road' *kron > qhʁon > qhon > hon, 'monkey' *krok > qhʁok > qhok > hok. Medial -ʒ- has fricated the initial and *kʒ- has become Laha kh-.

Proto-Southwestern-Kra	Proto-Western-Kra	Laha
*pwr-	*pwr-	ph(l)-
*kr-	*kr-	kh(l)-
*kʒ-	*kʒ-	kh-

		Laha	Gelao	Lachi	
*pwr-	A1	phən	pen	phī	die
*kr-	C1	khlaa	klau	hu	"Kra"/person
*kr-	A1	hon	qen	khī	road
*kr-	D1	hok	---	kho	monkey
*kr-	B1	xe (Tm)	klɒ	khja	head
*kʒ-	B1	khaa	xau	ku	dry (a.)

Note: The Ta Mit reflexes usually become fricatives: /fɯn/ 'die', /ha/ 'Kra', /xʏk/ 'monkey'. (For *kr-, the record shows variants x- and h-, probably depending on the following vowels).

5.5.2.2. Sesquisyllables with stops as the preinitial

All the clusters in the previous type have series 1 tones, which were assigned according to the voicelessness of the stop initial of the clusters. There are still the other sets of forms where Laha also shows velar clusters of the types kl- and kh(l)-, but which are accompanied by series 2 of tones. These clusters usually correspond to the simple initials *ɭ- or *r- in Gelao, implying that the tones were assigned according to the voiced medials. We may thus set up sesquisyllabic structures of the type *k-l- and *k-r- contrasting with clusters *kl- and *kr- of the previous section. It is probably relevant that for PSWK *k-l-, PG always shows retroflexed *ɭ-, which must have resulted from the rhoticization of intervocalic *-l- (> *ɭ-) in contrast with initial *l- (> *l-). (For the *k-l- examples below, Qs Gelao has /zɪ/, /zoŋ/ and /ze/ respectively).

		Laha	Gelao	Lachi	
*k-l-	A2	klәi	lai	lje	far
*k-l-	A2	kluŋ	zoŋ (Qs)	lei	star
*k-l-	C2	klaa B2	lau	ljų	near

*k-r-	A2	khlaa	zau	lu	ear
*k-r-	C2	khlaaŋ	ʐu (Lz)	kfiɣei	ribs
*k-r-	C2	khəi	zai	kfiɣe	sick

Note: It is unclear whether we should separate the onsets in such form as 'ear' from those of the others ('ribs' and 'sick') at this level based on the different Lachi reflexes (lfi- and kfiɣ-). It is possible to assume that Lachi lost the velar initial before -u (cf. Lachi /hu/ 'person' but /khĩ/ 'road', both from *kr-), while the medial has first become velarized -ɬ- and then sometimes became modern l-, as initial, or -ɣ-, as medial after velar.

5.5.2.3. Other complex onsets

For clusters which have sonorants or spirants as the first member, Laha usually dropped the medials.

		Laha	Gelao	Lachi	
*ml-	A2	maa	mlō (Lz)	nfijo	tongue
*mr-	A2	kmaaŋ B2	mpə-	---	ghost
*vj-	A2	van	ven	---	wind
*vj-	A2	vaa	vu	---	wing
*wj-	A2	van	ven	vō	tendon

Laha shows an example of labio-velar /kw-/ corresponding to PWK *vj-, pointing to a presyllable plus medial parallel to *k-r- and *k-l-. In addition, there are also a few instances which probably point to *b-l- and *m-l-. As in the case of *k-l-, intervocalic -l- in these latter two onsets has become PG *ļ- (Qs Gelao /ze/ and /zɪ/ respectively).

		Laha	Gelao	Lachi	
*(k-)vj-	A2	kwaaŋ	vi	vei	tall
*b-l-	A2	blaa	lau	---	afraid
*m-l-	B2	mləi	lei	---	d-in-law

5.6. Laha and PSWK Rimes

Laha has kept PSWK rimes almost intact. The length distinction of Proto-Western-Kra vowels in closed syllables normally corresponds to Laha vowel height contrast. Evidence from Laha also suggests that three additional endings need to be reconstructed at PSWK level; these are the two labials *-m and *-p, plus a liquid *-l.

5.6.1. Open rimes.

Laha has diphthongized proto high vowels: *-i > -əi and *-u > əu. The two mid vowel counterparts, *-e and *-o, become -ɛ and -ɔ respectively, while the central vowels *-ə and *-a have merged into -aa. Diphthongs *-ai and *-au remain unchanged, while *-auɯ has merged with -au.

*5.6.1.1. *-i > əi*

		Laha	Gelao	Lachi
d-in-law	B2	mləi	lai	---
tree	A1	təi	tai	tje
ask	C1	cəi	sai	tɕi̯
flow	A1	kləi	klai	(?)lje
far	A2	kləi	lai	lje
sick	C2	khəi	zai	kfiɣe
many	B1	?əi	?ai	---
satisfied	B1	ci	tshai	sɛ

Note: In the last example, the reflex remains -i after early prepalatal initial (*tʃ-). Contrast with /cəi/ 'ask', from *ts-.

*5.6.1.2. *-u > -əu*

		Laha	Gelao	Lachi
liquor	A1	pəu	pa	---
pig	A1	məu	mpa	mje
three	A1	təu	ta	tje
do	A2	dəu	tha	tfije
ripe	B1	ɳəu	ŋka	ɳi
pillar	A1	cou B2	sa	tɕi
horn	A1	kou	qa	kwɛ
old	B1	kou	qa	kwɛ

Note: The variant -ou occurs after early retroflex (cf. 'pillar', from *tʂ-) and velar initials (last two examples).

*5.6.1.3. *-e > -ɛ*

		Laha	Gelao	Lachi
goat	C2	mɛ	mæ (Lz)	mfio
wear	C2	lɛ	lai	lfijo
bear	A2	mɛ	mi (Lz)	mɒ

*5.6.1.4. *-o > -ɔ*

		Laha	Gelao	Lachi
know	A1	sɔ	sa	ɕu
laugh	A1	sɔ	sa	ɕu
salt	A2	ɳɔ	---	ɳfiũ

*5.6.1.5. *-ə > -aa*

		Laha	Gelao	Lachi
four	A1	paa B1	pu	pu
you	B2	maa	mu	m̥ C2
wing	A2	vaa	vu	---

*5.6.1.6. *-a > -aa*

		Laha	Gelao	Lachi
bran	B1	paa	pau	pu
hand	A2	maa	mpau	m̥
eye	A1	taa	tau	tju
thick	A2	naa	ntau	nju
dry	B1	khaa	xau	ku
snake	A2	ŋaa	ŋkau	ŋ

*5.6.1.7. *-ai > -ai*

		Laha	Gelao	Lachi
good	A1	ʔai	ɒ	ʔa
rat	C1	lai	lɒ	lja
excrement	C1	kai	qɒ	kạ
bite	B1	tai	zei (Qs)	tja
sand	A1	ŋai	---	n̥a

*5.6.1.8. *-au > -au*

		Laha	Gelao	Lachi
descend	C1	cau	tsəɯ	---
y brother	B2	jau	tsəɯ	ʑfio

navel	A2	dau	ʐo (Qs)	tɦjo
male	C1	pau (Tm)	po (Qs)	pǫ

*5.6.1.9. *-au > -au*

		Laha	Gelao	Lachi
grass	A1	klau	---	lo

5.6.1.10. Summary of open rimes

Proto-South-Western-Kra	Proto-Western-Kra	Laha
*-i	*-i	-əi
*-u	*-u	-əu
*-e	*-e	-ɛ
*-o	*-o	-ɔ
*-ə	*-ə	-aa
*-a	*-a	-aa
*-ai	*-ai	-ai
*-aɯ	*-aɯ	-au
*-au	*-au	-au

5.6.2. Closed rimes

The PSWK vowels in closed syllables, as when they appear in open rimes, differ primarily in quality. These are different from those of Proto-Western-Kra, which distinguish three pairs of vowels with contrastive length. Nonetheless, while we may assume that PSWK had a six-vowel system with qualitative contrast, it is also possible that the sub-phonemic quantitative distinction already existed between high and low vowels (*-i-, *-u-, and *-a-) on the one hand, and mid vowels (*-e, *-o and *-ə-) on the

other. This redundancy of qualitative and quantitative distinctions would then allow alternative vowel developments into the daughter languages.

PSWK labial and alveolar endings merged as PWK alveolars (PSWK *-m and *-n > PWK *-n and PSWK *-p and *-t > PWK *-t). And the PSWK liquid ending merged as PWK alveolar nasal (PSWK *-l > PWK *-n).

*5.6.2.1. *-a- > -a-*

		Laha	Gelao	Lachi
bitter	A1	kam	qan	kã
plant (v.)	C1	tam	tan	tjạ̃
dream	A1	pan	pan	pã
tendon	A2	van	ven	vɔ̃
louse	A2	mdal	tshen	tfijã
heavy	A1	khal C1	xen	kjã
thunder	A2	daŋ	thaŋ	tfijɔ̃
forehead	A2	daŋ B2	tã (Nd)	---
forget	D2	dap	te	tfijạ
close eye	D1	klap	kle	---
flea	D1	mat	mpe	mạ
nose	D1	ŋat D2	n̥tɕe	n̥a
bone	D2	dak	taŋ	tfijɒ̰
deep	D2	lak D1	laŋ	lfijɒ̰

*5.6.2.2. *-a- > -aa-*

		Laha	Gelao	Lachi
borrow	??	saam B2	tshu A1	---
thorn	C2	ŋaan (Tm)	n̥u	ŋfio

coal	B1	thaan	thu	thjo
grandchild	A1	klaal	klu	---
new	A2	maal	mu	mu
hawk	C2	klaaŋ	li	li
mosquito	A2	mjaaŋ B2	tɕhi	ʑi
bathe	D1	ʔaap	ʔɒ	---
blood	D1	plaat	plɒ	pjo
fruit	D2	maak	mei	mfiĩ
child	D2	laak	lei	lfii

*5.6.2.3. *-u- > -u-*

		Laha	Gelao	Lachi
front	A1	kun B2	qəɯ	kwe
heart	C1	lul	ləɯ	lje
water	C1	ʔuŋ	ʔəɯ	ʔi̯
fog/cloud	D2	muk	mpu	---
white	D1	ʔuk	zu	ʔi

*5.6.2.4. *-o- > -o-*

		Laha	Gelao	Lachi
road	A1	hon	qen	khĩ
die	A1	phən	pen	phĩ
buy	A1	col	sen	tɕĩ
vegetable	A2	kloŋ A1	luŋ	lfiũ
bamboo hat	D1	klop	---	---
tail	D1	cot	tshan	sɛ̯
bird	D2	nok	ntau	njo̯
fall (v.)	D1	tok	tau	tjo̯

Note: After labial initials, the reflex -o- has been dissimilated into -ə-; cf. 'die'. Ta Mit variety seems to usually have central vowel reflexes (variously transcribed as -ə-, -ɤ-, or -ɯ-) for this proto-vowel. For example, /sɤt/ 'tail', /nək/ 'bird', /fum/ 'die' and /tɕum/ 'buy'.

*5.6.2.5. *-i- > -i-*

		Laha	Gelao	Lachi
yellow	C2	ŋil	ɳtɕi	---
cucumber	A1	tiŋ	tɕi (Lz)	ti
year	A1	phiŋ	plei	pfii A2
full	D1	tik	tei	tfii D2

*5.6.2.6. *-e- > -ə-*

		Laha	Gelao	Lachi
shallow	C2	dəl	dzɑ̃ (Lz)	tfiī
sweet	C1	thəl	tɑ̃ (Lz)	---
fingernail	D1	kləp	kle	lɛ̨
raw	D2	dəp	te	tfijɛ̨

5.6.2.7. Summary of closed rimes

Proto-South-Western-Kra	Proto-Western-Kra	Laha
*-i-	*-ii-	-i-
*-e-	*-i-	-ə-
*-u-	*-uu-	-u-
*-o-	*-u-	-o-
*-ə-	*-a-	-a-
*-a-	*-aa-	-aa-

CHAPTER 6

CENTRAL-EASTERN-KRA

In this chapter, we will discuss the reconstruction of Proto Central-Eastern-Kra (PCEK), based on three languages: Paha, Buyang and Pubiao. The system of PCEK initials will be worked out in the first section (6.1) followed by PCEK rimes (6.2).

6.1. PCEK initials

6.1.1. Stops

**p-*

A. This initial has become p- in all languages. The Buyang reflex is at times fricated into f- before rounded -u- (e.g. 'fire', *pui > pβ^{w}i > fii). This initial has series 1 of tones.

		Paha	Buyang	Pubiao
fire	A1	pui	fii	pei
seed	A1	pii	pee	(pan)
four	A1	paa	paa	pee
father	B1	paa	paa	pee

B. There are certain words where Eastern-Kra reflexes are also p-, but Paha shows the voiced stop b- instead. The Paha reflex nonetheless has tone series 1, indicating original voicelessness. We may reconstruct the initial as PCEK prenasalized stop *mp-.

		Paha	Buyang	Pubiao	
peach	A1	baŋ	paŋ	paŋ	*mp-
bran	B1	bwaa	faa	---	*mpw-

C. The third set shows Eastern-Kra p- corresponding to Paha v-. Again the reflexes take tone series 1, indicating original voicelessness. The initial may be reconstructed as *pw-. On the other hand, except for the first example where PSWK also shows medial *-w-, other etyma appear to simply point to plain initial *p-. We may suggest the possibility of positing medial *-p- for these roots, assuming that it has become spirantized into v- in Paha. This will be consonant with the need to posit medial stops at other articulations (namely *-ʈ- and *-k-).

		Paha	Buyang	Pubiao	
ten	D1	vat	put	pɑt	*pw-
dream	A1	van	pan	pan	*ʔ-p-
male	B1	vaau	---	---	*ʔ-p-
walk	A1	vhii	vii A2	---	*fi-pw-

The proposed presyllable initials *ʔ- and *fi- are admittedly provisional, and have plausibly developed from various earlier initials descending from the first syllables of disyllabic forms. The suggested sounds are hypothesized on the following basis. Paha shows a plain reflex (v-) for the former (suggesting early glottalization; bear in mind that the reflex has tonal series 1 and thus does not point to an earlier voiced initial), and a breathy reflex (vh-) for the latter. The latter proposed sound /*fi-/ is further supported by the Buyang reflex which has become voiced (indicated by tonal series 2; the reflex has been fricated into v- by the *-w- medial).

**t- and *ʈ-*

A. The alveolar and retroflexed voiceless stops have merged in Eastern-Kra. Paha distinguishes the two by showing t- for the former and ð- for the latter.

		Paha	Buyang	Pubiao
three	A1	tuu	tuu	tau
plant (v.)	C1	tam	tam	tap
liver	D1	tap	tap	tjap
chest	D1	tak	tak	tak
fall	D1	tɔɔk	tuk	---
egg	A1	ðam	tam	---
bite	B1	ðaai	---	---

B. This set of words shows Eastern-Kra t- corresponding to Paha d-, for which we may posit PCEK *nt-. There does not appear to be evidence for setting up the prenasalized retroflexed stop *nʈ-.

		Paha	Buyang	Pubiao	
ash	B1	duu	tuu	tau	*nt-
full	D1	dɛɛk	tiak	tek	*nt-
eye	A1	daa	taa	tee	*nt-
get	B1	duɯɯ	tuə	tuu	*nt-
locust	D1	dak	tak	---	*nt-

C. The medial *-ʈ- may be posited for the correspondence Eastern-Kra t-: Paha ðh-. We may assume that the initial has been spirantized in Paha into ð- with (aspirated >) breathy quality having been induced by retroflexion. If there were an early medial *-t- after *ʔ- presyllable, we might expect that it would have become Eastern-Kra t- : Paha ð- (without breathiness), and thus its reflexes would have merged early with those of *ʈ-. After the smooth presyllable *ɦi-, it is in fact undetermined whether the stop medial was *-t- or *-ʈ-.

		Paha	Buyang	Pubiao	
head louse	A1	ðhuu	tuu	---	*C-t-
saliva	B1	ðhuu	tuu B2	tau	*fi-t-
short (not long)	C1	---	tii C2	tai	*fi-t-
seven	A1	ðhuu	tuu A2	tuu	*fi-t-

*k-

A. This sound has been often pronounced as modern post-velar. In the representative Buyang dialect, the sound has further become glottal stop ?-.

		Paha	Buyang	Pubiao
bitter	A1	qam	?am	---
chicken	A1	qai	?ai	qai
cogon	A1	qaa	?aa	qaa
front	A1	qɔɔn	?ɔɔn	---
old	B1	quu	?uu	qau
wildcat	C1	quu	?uu	qau
chin	C1	qaaŋ	?aaŋ	qaaŋ

B. The velar prenasalized stop *ŋk- may be set up in parallel with the corresponding bilabial and alveolar sounds. The prenasalized feature appears to prevent the backing of modern reflexes.

		Paha	Buyang	Pubiao	
handspan	D1	gaap	kaap	kɯəp	*ŋk-

C. The following set of initials show Paha velar spirant (ɣ-) corresponding to Eastern-Kra plain voiceless stop. We propose for this PCEK medial *-k-, in parallel with the reconstructed medial stops at other articulations.

		Paha	Buyang	Pubiao	
leg	A1	ɣaa	ʔaa	---	*ʔ-k-
horn	A1	ɣuu	ʔuu	qau	*ʔ-k-
dove	A1	ɣuu	kaai (Yl)	---	*ʔ-k-
ear of grain	A1	ɣan	---	---	*ʔ-k-
liquor	C1	ɣaa	---	---	*ʔ-k-
knee	B1	ʁoo	huu B2	qau	*fi-k-

The Paha initial reflex of the last example is pronounced very back (probably due to the following vowel -oo) and can be at times heard as simply smooth onset (fi-) into the vowel. For 'ear of grain' and 'liquor', cf. Lachi /kã/ and /ku/ respectively.

*ʔ-

This initial can be reconstructed without any problem and is reflected by the expected series 1 of tones.

		Paha	Buyang	Pubiao
good	A1	ʔaai	---	ʔai
have	A1	ʔan	ʔan	ʔan
meat/flesh	C1	ʔaau	ʔuə	ʔjau
water	C1	ʔɔɔŋ	ʔɔɔŋ	ʔɔŋ
crow (n.)	D1	ʔaak	---	ʔaak
hold in mouth	A1	ʔam	ʔum	ʔɑm
vegetable	D1	---	ʔup	ʔɑp
sleep	B1	---	ʔuu	ʔau
soil	D1	---	ʔɔɔt	ʔuət

6.1.2. Sibilants

A. The representative Buyang dialect has merged all sibilants into θ-, but the Yalhong variety has a fricative for *s- but an affricate for the others, e.g. /θau/ 'two' but /tsja/ 'root', and /tsaai/ 'ask'. Paha has usually kept early fricative and affricate initials distinct.

		Paha	Buyang	Pubiao	
two	A1	θaa	θaa	ɕee	*s-
hair	A1	---	θam	θam	*s-
male/husband	A1	---	θee	ɕje	*s-
root	A1	tɕaaŋ	θaaŋ	tɕaaŋ	*ts-
buy	A1	tɕɛn	---	---	*ts-
ask	B1	---	tsaai (Yl)	---	*ts-
pestle	D1	tɕaak	ɕiak	---	*tʃ-

B. When preceded by presyllabic nasal, the fricative has become a stop (*ns- > nth > dh-) in Paha.

		Paha	Buyang	Pubiao	
hair	A1	dham	θam	θam	*ns-
pillar	A1	dʑhuu	θuu	tɕau	*nts-

C. When occurring as medial, the fricatives become spirantized in Paha into either ðh- or jh- depending on whether the original sounds were respectively alveolar (*-s-) or alveo-palatal (*-ʃ-; contrast 'laugh' with 'rope', for instance). The (aspirated >) breathy quality of the modern reflex is clearly the remnant of early fricatives. The medial affricate, on the other hand, has become a plain spirant (cf. 'tooth'). The last example is irregular in that the Paha reflex lacks the expected breathiness, pointing to an alternation *ʔ-tʃ-.

		Paha	Buyang	Pubiao	
intestine	C1	ðhii	---	θai	*ʔ-s-
garlic	B1	ðhɛɛ	θui	θei	*ʔ-s-
laugh	A1	ðhɯɯ	θoo	θaau	*ʔ-s-
tooth	A1	jɔɔŋ	θɔɔŋ	θuaŋ	*ʔ-tʃ-
rope	D1	jhuu	caak D2	θaak	*ɦ-ʃ-
tail	D1	jɛt	cut D2	θɑt	*ɦ-tʃ-

Note: For 'tooth', 'tail' and 'rope', the Yalhong forms are /tsuə/, /tsɔt/ and /tsɛ/ respectively.

6.1.3. Implosives

A. This set of initials, *ɓ-, *ɗ- and *ᶑ-, has become glottalized stops in Buyang and Pubiao. The latter two sounds, in fact, have merged in these languages. Modern Paha reflexes of *ɓ- and *ɗ- are plain voiced stops, but are accompanied by series 1 tones, indicating early unvoiced initials. The retroflexed *ᶑ- is reflected as ð-, contrasting with d- for *ɗ-. (Cf. the similar contrast between *t- and *ʈ- which have become Paha t- and ð- respectively).

		Paha	Buyang	Pubiao	
pluck	D1	bit	ʔbitⁿ	---	*ɓ-
orphan	C1	---	ʔbɔɔŋ	ʔbuoŋ	*ɓ-
skin	A1	---	ʔbuŋ	ʔboŋ	*ɓ-
do	A1	duu	ʔduu	---	*ɗ-
forget	D1	dap	ʔdap	ʔdjap	*ɗ-
itchy	D1	dɔɔk	ʔduk	---	*ɗ-
split	B1	---	ʔdie	ʔdaai	*ɗ-
back (side)	C1	---	ʔdaŋ	ʔdaŋ	*ɗ-
chopsticks	B1	daau	---	ʔdau	*ɗ-

crow (v.)	A1	ðaŋ	ʔdaŋ	ʔdaŋ	*ɖ-
leaf	A1	ðɛɛŋ	ʔdiaŋ	---	*ɖ-

B. Another set of words shows Buyang glottalized stop initials corresponding to Paha and Pubiao nasals. We may reconstruct for this set of initials the prenasalized counterpart of the previous implosive set, assuming that the Paha and Pubiao reflexes result from the influence of this prenasalization. As in case of prenasalized voiceless stops, there is no evidence to distinguish *retroflexed initial from *alveolar.

		Paha	Buyang	Pubiao	
escape	A1	man	ʔban	---	*mɓ-
shoulder	B1	maa	ʔbaa	ɱaa -i	*mɓ-
navel	A1	naau	ʔduə	nau	*nɗ-
gall bladder	A1	nii	ʔdii	---	*nɗ-
moon	A	naan	ʔdaan	nin	*nɗ-
body louse	A	nan	tɛn A2	nan	*nɗr-

The Buyang reflex of the last example is irregular. The initial of this word has been reconstructed as Proto-Gelao *dr-, and may be assumed as *nɗr- here. This intervoiced -ɗ- then became Buyang *d- > t- (tones series 2), contrasting with *nɗ- > ʔd- (tone series 1).

6.1.4. Nasals

Voiced nasals

A. This set of initials remain largely intact in modern languages, and take series 2 of tones indicating a voiced origin. In Pubiao, the reflexes are accompanied by breathiness in syllables with tones A and B; in Paha, the breathiness is found in non-A tone syllables.

		Paha	Buyang	Pubiao
new	A2	maan	maan	---
tongue	A2	maa	mee	mfijee
yam	A2	man	man	mfiən
frost	A2	---	mee	mfiɑɑi
you	A2	məə	maa	mfiii
smelly	B2	mhuu	maɯ (Yl)	mfiuu
beard	C2	---	muəm	muum
cloud	D2	mhook	mok	muok
hair	D2	mhut	mɔt (Yl)	---
right (side)	D2	mhit	mat (Yl)	mat
fat	A2	nan	nɛn	nfiin
snow	A2	nii	nei (Yl)	nfiei
field	A2	---	naa	nfiee
bird	D2	nhook	---	nokŋ
give	D2	nhaak	naak	---
salt	A2	n̩ɯɯ	n̩oo	n̩fiũ
tendon	A2	n̩in C1	n̩in	ŋʏn
snake	A2	ŋaa	ŋaa	ŋfiɯɑ
sesame	A2	ŋaa	ŋaa	ŋfiɯɑ
sleep	B2	ŋhuu	---	---
horse	C2	ŋhaa	ŋaa	---
deaf	C2	---	ŋatn	ŋan
thorn	C2	ŋhaan	n̩aan	ŋɯən

B. There are other sets of words where Paha shows instead series 1 tones. One set shows modern Paha plain nasal initials, and another set breathy nasals. In parallel

with the reconstructions set up for stops, we may posit the presyllabic initials *ʔ- for the former set and *fi- for the latter.

		Paha	Buyang	Pubiao	
bear	A2	mii A1	---	mfije	*ʔ-m-
thick	A2	naa A1	naa	nfiee	*ʔ-n-
yellow	C2	ŋaan C1	ŋaan	ɳin	*ʔ-ŋ-
flower	C2	ŋaa C1	ŋa (Lj)	---	*ʔ-ŋ-
five	A2	mhaa A1	maa	mfiɑɑ	*fi-m-
mole	A2	mhaai A1	maai	---	*fi-m-
drunk	A2	mhii A1	mee	---	*fi-m-

Voiceless nasals

A. The voiceless feature of this set of initials has been kept in Pubiao and Paha. Reflexes in all languages show tone series 1, indicating original voicelessness.

		Paha	Buyang	Pubiao
belly	D1	mhɔɔk	---	m̥ok
scold	B1	ɳhaan	ɳɛɛn	---
pillow	B1	ɳhii	ɳee	---
pus	B1	ŋhuu	muu	hau
nose	D1	ŋhat	---	---

Note: For 'pus', the reflexes may point to *hŋw-, whose labio-velar resulted in Buyang labial m-. The loss of nasal quality at the velar articulation (*hŋ-) is known to occur in many Tai dialects and is exemplified here in Pubiao.

B. There is another set of initials where Eastern-Kra voiceless nasals (tone series 1) corresponds to Paha voiced nasals (tone series 2). We may temporarily write *xm- for this set, assuming that the presyllable *x- has become *h- in Eastern-Kra but ɣ- in Paha before the tone split. (Cf. Proto-Tai *x- which has become ɣ- or fi- in certain Northern Tai dialects).

		Paha	Buyang	Pubiao
dog	A1	maa A2	---	ɱaa
pig	A1	muu A2	muu	ɱuu
flea	D1	mhat D2	mat	ɱat
six	A1	nam A2	nam	ɳam
door	A1	ŋɯɯ A2	---	---

Note: For 'door', cf. Gelao (Lz) /hoŋ/, (Wz) /ŋkau/ A1.

6.1.5. Resonants

**(ɣ)w-*

This initial has become v- in Paha and Buyang, and the postvelar approximant G- in Pubiao.

		Paha	Buyang	Pubiao
wing	A2	vaa	---	Gɯə
wind	A2	vum	vən	---
sieve	A2	vaaŋ	vaaŋ A1	Gɯəŋ
fly (n.)	A2	---	vən	---
thin (not thick)	C2	---	vɛɛ	Gaa
go	C2	vaa	vaa	---

**j-*

The reflexes of this initial are straightforward and all show series 2 of tones.

		Paha	Buyang	Pubiao
mosquito	A2	jaaŋ	jaaŋ	jfiaaŋ
sorghum	A2	jaaŋ C1?	jaaŋ	---
rain	A2	jin	juət	---
oil	B2	jhuu	---	jfiuu
y brother	B2	---	juə	---
rest	C2	---	jaŋ	jɯŋ
son-in-law	C2	jhuu	---	jau
grandma	C2	jhaa	jaa	---

One example shows Paha reflex of tone series 1 instead, perhaps pointing to *ʔ- presyllabic initial.

neck	A2	jɯɯ A1	joo	---	*ʔ-j-

**l- and *ɭ-*

As in the case of stops and implosives, the retroflexed initial is distinguished from alveolar by the Paha spirantal reflex ð- (cf. *ʈ- and *ɖ- which also became Paha ð-). Reflexes of these initials have series 2 of tones, indicating original voicing.

		Paha	Buyang	Pubiao
armpit	A2	---	lie	lfiii
behind	A2	lan	lɔn (Yl)	---
above	A2	---	luu	lfiuu
earth	B2	---	luu	lfiuu
lick	C2	---	lɛɛm	liam
wear	C2	lii	lee	---

steal	C2	lham	luəm	---
child	D2	lhaak	laak	---
vegetable	A2	ðuŋ	---	---
star	A2	ðɔɔŋ	lɔɔŋ	lfiuuŋ
hawk	C2	ðaaŋ	laaŋ	laaŋ

**hl-*

This is the voiceless counterpart of the voiced lateral *l-. As in case of voiceless nasals, the voiceless feature has been kept in Paha and Pubiao. All reflexes show series 1 tones.

		Paha	Buyang	Pubiao
heart	C1	lhin	---	---
deep	D1	lhak	lak	ɬak
stomach	A1	luŋ -i	luŋ	ɬoŋ

**r-*

This initial has become a spirant in some languages. In Yalhong dialect, the voiced spirant reflex has further devoiced into ɬ-, but still shows tone series 2 indicating early voicing. For examples below, Yalhong has /ɬaa/ 'bee', /ɬɔŋ/ 'rotten' and /ɬak/ 'wet'. Paha reflex /ð-/ is the same as that of retroflexed initials.

		Paha	Buyang	Pubiao
bee	A2	ðii	ðee	rfiɑɑi
rotten	B2	ðhuŋ	ðuŋ	---
sick	C2	ðii	ðii	rai
write	C2	ðaai	ðaai	---
take by force	D2	ðhaak	---	---
wet	D2	---	ðak	rak
crab	D2	ðhaat	ðaat	---

**hr-*

This is the voiceless counterpart of the previous initial. All reflexes show tone series 1. The Pubiao variant reflex h- is probably conditioned by the following rime (*-um), but examples are too few to be precise about the exact cause.

		Paha	Buyang	Pubiao
shrink	D1	---	ðut	ʂɑt
cut	C1	ðan	---	ʂan
drink	C1	ðam	ham (Yl)	hɑm

6.1.6. Other complex onsets

6.1.6.1. Stop presyllabic initials plus resonant medials

A. The presyllabic grave initials (*p- and *k-) were usually lost in Buyang, while they were clustered with the main syllable resonants in Pubiao (the resonants might then be lost after velars). Reflexes in these languages have tone series 2 according to the voicing of the main syllable resonant initials.

In Paha, the presyllabic initials have sometimes clustered with resonants, and the tones were always assigned according to the voiceless pre-initials.

		Paha	Buyang	Pubiao	
afraid	A2	pjaa A1	laa	---	*p-l-
rock	A2	pʏaa A1	ðaa	pfijɑɑ	*p-r-
ear of grain	A2	---	ðaaŋ	pfijɑɑŋ	*p-r-
ear	A2	kaa A1	ðaa	(qa) rfiɑɑ	*k-r-
tall	A2	vhəəŋ A1	vaaŋ	qfiɑɑŋ	*k-w-
far	A2	ðhii A1	lii	qfiai	*k-l-

B. The alveolar presyllabic initial was also lost in Buyang, and we may generalize that the stop presyllabic initials all disappeared in this language, leaving modern resonant reflexes with tone series 2. In Pubiao, the alveolar stop preinitial with lateral release (*t-l-) has resulted in voiceless fricative ɬ-. In Paha, it must have first become the velar cluster *kl-, whose lateral medial was then lost. (A number of etyma reconstructible with an -l- cluster in Southwestern-Kra also lost their medial in Paha, e.g. Gelao (Wz) /plɒ/, Laha /plaat/, Paha /pɛ/ 'blood'; Gelao (Lz) /plo/ Paha /baŋ/ 'peach').

		Paha	Buyang	Pubiao	
flow	A1	qui	lui A2	ɬei	*t-l-
sunny	A1	qaaŋ	---	ɬaaŋ	*t-l-
medicine	A1	qaau	luə A2	---	*t-l-
waist	C1	quu	---	---	*t-l-
fingernail	D1	ɣap	lip D2	---	*ʈ-l-

The Paha reflex in the last example is irregular. We temporarily assume that the preinitial might have been retroflexed *ʈ- which normally gives Paha spirant reflex ð-, but which has further dissimilated into velar, i.e. *ʈ-l- > ɣ- in parallel with *t-l- > (*kl-) > q-.

6.1.6.2. Clusters with velar stop as initials

The following set of examples seem to point to velar clusters with resonant medials. The initial appears to have been generally fricated and become h- and qx- in Buyang and Pubiao respectively (with the exception of medial *-w- which does not fricate the initial in Pubiao. In Paha, the medial -r- is dropped (cf. *k-r- > k- above), while the palatal medial has induced (frication >) breathiness (which was lost in A tone syllables).

		Paha	Buyang	Pubiao	
heavy	A1	qan	han	qxan	*k3-
light	C1	qfiaa	---	qxan B1	*k3-
dry (a.)	B1	qfiaa	haa	qɣaa -i	*k3-
paddy	A1	---	haaŋ	qxaaŋ	*k3-
road	A1	---	hun	qxwɑn	*kr-
house	A1	qaan	---	---	*kr-
blood	C1	---	haa	qaa	*kw-
ladder	A1	---	hɔɔŋ	quuŋ	*kw-

6.1.6.3. Nasal presyllable initial

The following examples may point to another type of complex onsets with presyllabic nasal plus resonant: *m-r-:

		Paha	Buyang	Pubiao	
eight	A2	muu	ðuu	rfiɯɯ	*m-r-
year	A2	mɛɛŋ	ðiaŋ	---	*m-r-

6.2. PCEK rimes

Proto-Central-Eastern-Kra shows a six vowel system similar to that of Proto-Southwestern-Kra. In open rimes, at least four diphthongs may also be reconstructed: *-ai, *-aɯ, *-au and *-ui. In closed rimes, the six proto vowels have paired up into three sets with contrastive length (similar to the system found in Western-Kra). Seven final consonants are reconstructible: three nasals (*-m, *-n and *-ŋ), three stops (*-p, *-t and *-k) and a liquid (*-l). These endings, except *-l, are kept very much intact in the languages of this branch.

6.2.1. Open rimes

*6.2.1.1. *-aa*

This rime has become -aa in all languages. But Pubiao shows certain variants: front vowel -ee after acute initials and back vowel -ɑɑ after breathy initials. In addition, a velar onglide has developed after velar breathy initials so that the reflex becomes -ɯɑ.

		Paha	Buyang	Pubiao
shoulder	B1	maa	ʔbaa	ɱaa
cogon grass	A1	qaa	ʔaa	qaa
dry	B1	qɦaa	haa	qɣaa
nine	B1	dhaa	vaa	ɕjaa
eye	A1	daa	taa	tee
two	A1	θaa	θaa	ɕee
thick	A2	naa A1	naa	nɦee
field	A2	---	naa	nɦee
five	A2	mhaa A1	maa	mɦɑɑ
fish	A1	pjaa	pjaa	pɦjɑɑ A2
stone	A2	pɣaa A1	ðaa	pɦjɑɑ
ear	A2	kaa A1	ðaa	rɦɑɑ
snake	A2	ŋaa	ŋaa	ŋɦɯɑ
sesame	A2	ŋaa	ŋaa	ŋɦɯɑ

*6.2.1.2. *-ii*

This rime remains -ii in Paha and Buyang, but diphthongized into -ai in Pubiao. The last example is somewhat irregular, showing -ai in all languages. This is the only

example of *-ii following a velar, and in the absence of counter-examples it is possible to explain this variant correspondence as conditioned by the initial.

		Paha	Buyang	Pubiao
tree	A1	tii	---	tai
far	A2	ðhii A1	lii	qxai
short	C2	---	tii	tai
sick	C2	ðhii	ðii	rai
walk	A1	vhii	vii A2	---
intestine	C1	ðhii	---	sai
chicken	A1	qai	ʔai	qai

*6.2.1.3. *-ee*

This rime remains -ee in Buyang, but in Paha has merged with *-i and become -ii. Pubiao has diphthongized the rime into -aai, which further became -ɑɑi after breathy initials (cf. the parallel diphthongization of *-oo > -aau). The conditions for the variant -ee are yet unclear.

		Paha	Buyang	Pubiao
seed	A1	pii	pee	---
comb (n.)	A1	ðhii	θee	---
wear	C2	lhii	lee	---
goat	C2	mhii	---	---
bear (n.)	A2	mii A1	---	mɦje
male	A1	---	θee	ɕje
pillow	B1	ɳ̊hii	ɳ̊ee	---
choose	B2	θii	lee	---

frost	A2	---	mee	mfiɑɑi
bee	A2	ðii	---	rfiɑɑi

*6.2.1.4. *-uu*

The development of this rime resembles that of *-i. It remains -uu in Paha and Buyang, but has diphthongized into -au in Pubiao (except after labials where it also remains -uu). In addition, Pubiao shows a central variant -ɯɯ after rhotic r-.

		Paha	Buyang	Pubiao
pus	B1	ŋhuu	muu	hau
saliva	B1	ðuu	tuu B2	tau
old	B1	quu	ʔuu	qau
wild cat	C1	quu	ʔuu	qau
horn	A1	ɣuu	ʔuu	qau
ash	B1	duu	tuu	tau
do	A1	duu	ʔduu	---
sleep	B1	(ŋhuu B2)	ʔuu	ʔau
pillar	A1	dzhuu	θuu	tɕau
I	A1	kuu	kuu	kau
three	A1	tuu	tuu	tau
son-in-law	C2	jhuu	---	jau
knee	B1	ʁoo	huu B2	qau
eight	A2	muu	ðuu	rfiɯɯ
ripe	B1	muu	muu	---
smelly	B2	mhuu	---	mfiuu
pig	A1	muu	muu	ɱuu

*6.2.1.5. *-oo*

This rime remains Buyang -oo, but centralized to -ɯɯ in Paha. Pabiao shows a long back diphthong -aau, parallel with -aai from *-ee.

		Paha	Buyang	Pubiao
neck	A2	jɯɯ A1	joo	---
door	A1	ŋɯɯ A2	---	---
laugh	A1	ðhɯɯ	θoo	θaau
salt	A2	n̥ɯɯ	n̥oo	(n̥ɦiũ)

*6.2.1.6. *-ə-*

This rime has merged with *-aa in Paha and Buyang. In Pubiao, it has become -ee, which is further raised to -ii after breathy initials. After velar onsets, an onglide -ɯ- is added, and the reflex become -ɯə. The reconstruction of this rime is somewhat tentative. Pubiao initials p- and G- are not currently found with *-aa, and thus the reflexes here may be conditioned variants of that rime. Also, the first three etyma are kinship terms, numerals, or pronouns, which may at times develop peculiar sound changes under pragmatic factors.

		Paha	Buyang	Pubiao
father	B1	paa	paa	pee
four	A1	paa	paa	pee
you	A2	məə -v	maa	mɦii
wing	A2	vaa	---	Gɯə B

*6.2.1.7. *-au*

This rime has merged with *-au and become -aau in Paha, but has merged with *-uu and become -au in Pubiao. Buyang shows a mid vowel reflex -ə with rounded onglide.

		Paha	Buyang	Pubiao
navel	A1	naau	ʔduə	nau
meat	C1	ʔaau	ʔuə	ʔjau
younger brother	B2	---	juə	---
male/husband	C1	vaau	---	---
medicine	A1	qaau	luə A2	---

*6.2.1.8. *-ai*

This rime has become -aai in all languages. The Pubiao reflex is the same as that of *-ee.

		Paha	Buyang	Pubiao
love	A1	ŋaai	maai	ŋaai
good	A1	ʔaai	---	ʔaai
bite	B1	ðaai	---	---
monkey	C1	taai	---	---
see	C1	qaai	---	---

*6.2.1.9. *-au*

This rime has become Paha -aau, parallel with Paha -aai for *-ai. Pubiao shows a monophthong -oo (while proto *-oo has become -aau, cf. 6.2.1.5).

		Paha	Buyang	Pubiao
nest	C1	ðaau	---	θoo

*6.2.1.10. *-ui*

This rime is usually reflected as Pubaio -ei. Paha has kept the diphthong after grave initials, otherwise merged it with *-ii. Buyang has normally kept the diphthong, except in the first example where the high rounded vowel -u- of the diphthong has fricated the preceding bilabial initial and been lost (*pui > pβ^{w}i > fii).

fire	A1	pui	fii	pei	*-ui
flow	A1	qui	lui	ɬei	*-ui
snow	A2	nii	---	nfiei	*-ui

6.2.1.11 Summary of PECK open rimes

	Paha	Buyang	Pubiao
*-aa	-aa	-aa	-aa
*-ii	-ii	-ii	-ai
*-ee	-ii	-ee	-aai
*-uu	-uu	-uu	-au
*-oo	-ɯɯ	-oo	-aau
*-əə	-aa	-aa	-ee
*-ai	-aai	-aai	-ai
*-aɯ	-aau	-uə	-au
*-au	-aau	---	-oo
*-ui	-ui	-ui	-ei

6.2.2. Closed rimes

*6.2.2.1. *-a-*

This vowel generally remains -a- in all languages. For the rimes *-an and *-al, Buyang adopts variants -ə- after labiao-dental v-, and -ɛ- after acute consonants. In Pubiao, the reflex may be raised by breathy initials to -ə-, which further becomes -i- between acute consonants (e.g. 'fat').

		Paha	Buyang	Pubiao
hair	A1	---	θam	θam
black	A1	lham	ʔdam	ʔdam
six	A1	nam A2	nam	ɳam
bitter	A1	qam	ʔam	---
egg	A1	ðam	tam	---
plant	C1	tam	tam	tap
hatch	C1	qam	ʔam	qam
bite	C2	---	ðam	ram
dream	A1	van	pan	pan
have/stay	A1	ʔan	ʔan	ʔan
sun	A1	vhan	vən	ʍfiən A2
fly (n.)	A2	---	vən	---
scold	B1	ɳhan	ɳɛn	---
crow (v.)	A1	ðaŋ	ʔdaŋ	ʔdaŋ
rest	C2	---	jaŋ	ʐɯŋ
back	C1	---	ʔdaŋ	ʔdaŋ
peach	A1	baŋ	---	paŋ
forehead	A1	ðaŋ	---	ʔdaŋ
liver	D1	tap	tap	tjap

close eye	D2	---	nap	nap
forget	D1	dap	ʔdap	ʔdjap
flea	D1	mhat D2	mat	ɱat
nose	D1	ŋhat	---	---
chest	D1	tak	tak	tak
hear	D2	jhak	---	tɕak
deep	D1	lhak	lak	ɬak
wet	D2	---	ðak	rak

6.2.2.1.1. Words in the following set have been reconstructed as PSWK *-al. Cf. Laha /khal/ 'heavy', /mnal/ 'fat', /mdal/ 'louse', /mal/ 'yam', /jal/ 'rain', /kel/ 'iron' and /ŋal/ 'deaf'. Eastern-Central-Kra languages usually show the merger of this rime with *-an, but the Yalhong variety (Southern Buyang) has kept the distinction between the two by showing reflexes -an for *-an but -at for *-al. For the examples below, Yalhong has the following forms: /ʔbɔt/ 'escape', /nɔt/ 'fat', /ʔdɔt/ 'louse', /ʑuut/ 'rain', /qat/ 'iron, and /iit/ 'deaf' (for *ŋ- > ø- in the last example, cf. Yalhong /iiə/ Buyang /ŋaai/ A1 'maggot').

		Paha	Buyang	Pubiao
heavy	A1	qan	han	kxan
escape	A1	man	ʔban	---
fat	A2	nan	nɛn	nɦin
body louse	A2	nan A1	tɛn	nan A1
yam	A2	man	man	mɦən
rain	A2	jin	juət	---
iron	C1	qan	---	---
deaf	C2	---	ŋat^{n}	ŋan

Note: The change from nasal > stop or preploded nasal ending (e.g. -m > -p and -n > -t^n) occurs sporadically in a few Pubiao and Buyang forms with tone C (cf. 'plant (v.)' and 'deaf'). This was probably caused by the glottal constriction at the end of the syllable that accompanied this proto-tone in these languages.

*6.2.2.2. *-aa-*

This rime has become -aa- in all languages. Pubiao shows variants -ɑɑ- after breathy initials and -ɯə- after velars (cf. the same change as in the open rime *-aa). Paha shows an instance of the shift from -aa- > -əə-, perhaps influenced by breathy initial (cf. 'tall').

		Paha	Buyang	Pubiao
thorn	C2	ŋaan	ɳaan	ŋɯən
ax	A1	qɣaan	ʔaan	---
tall	A2	vhəəŋ A1	vaaŋ	qfiɑɑŋ
hawk	C2	ðaaŋ	laaŋ	laaŋ
mosquito	A2	jaaŋ	jaaŋ	jaaŋ
cooked rice	A1	---	haaŋ	qhaaŋ
sieve	A2	vaaŋ	vaaŋ A1	Gɯəŋ
handspan	D1	gaap	kaap	kɯəp
bathe	D1	ʔaap	---	---
needle	D1/2	---	ŋaat	ŋɯət^n
ladder	D1	tɕaat	---	---
crab	D2	ðhaat	---	---
sock	D2	maat	maat	maat
fruit	D1	maak	maak	mjaak D2
give	D2	nhaak	naak	---

crow (n.)	D1	ʔaak	---	ʔaak
child	D2	lhaak	---	---

The following set of words has PSWK final *-l. Again, the Yalhong variety shows final -t for the rime reconstructible as *-aal, contrasting with -aan for *-aan. For the examples below, Yalhong has the following forms: /maat/ 'new', /ŋaat/ 'yellow'. Cf. also Laha /maal/ 'new', /saal/ 'husked rice' and /ŋil/ 'yellow'. The last example seems to show alternation between *-aal and *-iil.

		Paha	Buyang	Pubiao
new	A2	maan	maan	---
husked rice	A1	---	---	θaan
yellow	C2	ŋaan	ŋaan	ɳin

*6.2.2.3. *-i-*

This vowel remains -i- in Paha and Buyang. Paha shows an instance of -i- > -a- after spirant initial ('fingernail'). Pubiao has lowered the vowel into -a-, which variantly become -ɑ- before velars (e.g. 'nose') or -ə- after breathy initials (e.g. 'tendon').

		Paha	Buyang	Pubiao
tendon	A2	ɳin C1	ɳin	ŋfiən
nose	C1	---	tiŋ	tɑŋ
raw	D1	---	ʔdip	ʔdap
fingernail	D1	ɣap	lip D2	---
pluck	D1	bit	ʔbitn	---
right (side)	D2	mhit	---	matn
weep	D2	ɳhit	ɳiet D1	---

Note: The last example seems to show alternation between *-it (Paha) and *-iit (Buyang).

The following examples show the Laha reflex of rime *-il: /dəl/ 'shallow' and /thəl/ 'sweet'. Paha and Pubiao, as expected, have merged the rime with *-in (Paha *-in > -an after spirants). But the Buyang reflex appears as if it goes back to *-iil, perhaps due to the medial -j- reconstructible for these two etyma (*ɖj- and *tj- respectively).

		Paha	Buyang	Pubiao
shallow	B1	ðan	tien B2	ʔdan
sweet	C1	---	ʔjen	---

*6.2.2.4. *-ii-*

This proto vowel has been found mainly before velar endings. Before velars, Buyang has diphthongized the vowel into -ia-, which further monophthongized back to -ɛɛ- in Paha. The few instances of the vowel before labials and alveolars suggest that in Buyang the reflex is variantly front -ie- before alveolar (e.g. 'weep') and (-iɛ >) -ɛɛ- before labial (e.g. 'lick'). In Pubiao, the vowel has normally diphthongized into -ie-, which becomes -e- before velars.

		Paha	Buyang	Pubiao
lick	C2	---	lɛɛm	liem
cucumber	A1	dɛɛŋ	tiaŋ A2	---
leaf	A1	ðɛɛŋ	ʔdiaŋ	---
hot	C1	pɛɛŋ	---	---
year	A2	mɛɛŋ	ðiaŋ	---
ginger	A1	qɣɛɛŋ	ɕiaŋ	qeŋ
deer	D1	---	---	ʔdiet
weep	D1	(n̥hit)	n̥iet	---

full	D1	dɛɛk	tiak	tek
excrement	D1	---	ʔiak	ʔjek

*6.2.2.5 *-u-*

This vowel remains -u- in Buyang. In Paha, the vowel has centralized into -a- before labials and alveolars; the reflex has further fronted to -ɛ- after palatal initials (e.g. 'tail'). The vowel has remained -u- before velar nasal, but has become -ɔɔ- (merging with *-uu-) before velar stop. In Pubiao, the vowel has lowered to -ɑ- (with onglide -w- after velar initial, e.g. 'road') before labials and alveolars and to -o- before velars. The reflex has become -ə- after breathy initials (e.g. 'rain'). Cf. the parallel lowering of the high vowel *-i- > -a-/-ɑ- in this language.

		Paha	Buyang	Pubiao
hold in mouth	A1	ʔam	ʔum	ʔɑm
drink	C1	ðam	ham (Yl)	hɑm
steal	C2	lham	(luəm)	---
road	A1	---	hun	kxwɑn
rain	A2	---	mun	mfiən
back/behind	A2	lan	---	---
skin	A1	---	ʔbuŋ	ʔboŋ
stomach	A1	luŋ	luŋ	ɬoŋ
rotten	B2	ðhuŋ	---	---
vegetable	A2	ðuŋ	---	---
vegetable (2)	D1	---	ʔup	ʔɑp
fart	D1	ðat	tut	tɑt
tail	D1	jɛt	ɕut	θɑt
shrink	D1	---	ðut	ʁɑt

ten	D1	vat	put	pɑt
fall	D1	tɔɔk	tuk	---
foot	D1	kɔɔk	---	---
itchy	D1	dɔɔk	ʔduk	---
belly	D1	mhɔɔk	---	ɱok
bird	D2	nhook	---	nokŋ

The following example has corresponding final -l in Laha: /col/. The Paha reflex is as expected *-ul > *-un > -ɛn (after palatal initial, cf. 'tail' above).

		Paha	Buyang	Pubiao
buy	A1	tɕɛn	---	---

*6.2.2.6. *-uu-*

This vowel has diphthongized in Buyang into -uə- before labials and further become -ɔɔ- before alveolar and velar endings. Paha regularly shows -ɔɔ-, which was raised to -oo- after breathy initials (e.g. 'cloud'). Pubiao shows a number of variants. Before velars, the vowel reamins -uu- after breathy initials ('star') or rounded medials ('ladder', from *kw-). Otherwise the vowel is diphthongized into -ua- ('tooth' and 'cloud'), which becomes -ɔ- in *C tone syllables ('water' and 'orphan'). Before alveolar, the vowel has become -uə-.

		Paha	Buyang	Pubiao
beard	C2	---	muəm	muum
steal	C2	(lham)	luəm	---
teach	A1	---	θɔɔn	θuən
spirit	A2	---	ŋɔɔn	ŋɦuən

front/before	A1	qɔɔn	ʔɔɔn	---
tooth	A1	jɔɔŋ	θɔɔŋ	θuaŋ
star	A2	ðɔɔŋ	lɔɔŋ	lfiuuŋ
water	C1	ʔɔɔŋ	ʔɔɔŋ	ʔɔŋ
ladder	A1	---	hɔɔŋ	quuŋ
drum	A2	---	lɔɔŋ	---
orphan	C1	---	ʔbɔɔŋ	ʔbɔŋ
soil	D1	---	ʔɔɔt	ʔuət
cloud	D2	mhook	mok -v	muak
white	D1	lɔɔk	ʔɔɔk	---

One example shows the Laha reflex of *-uul: /lul/ C1 'heart'. The related form in Central-Eastern-Kra has been only found in Paha, but its reflex seems to point to *-in/-il: /lhin/ C1.

6.2.2.7. Summary of PCEK closed rimes

The low vowels *-a- and *-aa- stay largely intact before all finals, while the reflexes of the high vowels *-i-, *-ii-, *-u- and *-uu- may be conditioned by endings. The long high vowels *-ii and *-uu usually broke into diphthongs (-iə- and -uə- or their variants), which may be further monophthongized back to low vowels (-ɛɛ- and -ɔɔ- respectively). The short high vowels *-i- and *-u-, on the other hand, may be laxed into -a-/-ɑ- (or their variants); this regularly occurs in Pubiao and, to a lesser degree, in Paha. Rimes with final liquid *-l have generally merged with those with alveolar nasal *-n, but the Yalhong language (Southern Buyang) shows final stop -t for the former contrasting with the expected nasal -n for the latter.

	Paha	Buyang	Pubiao
*-a-	-a-	-a-	-a-
*-aa-	-aa-	-aa-	-aa-
*-ip	-ap	-ip	-ap
-in/-il	-in	-in	-an
*-it	-it	-it	-at
*-iŋ	---	-iŋ	-ɑŋ
*-iim	---	-ɛɛm	-iem
*-iit	---	-iet	-iet
*-iiŋ	-ɛɛŋ	-iaŋ	-eŋ
*-iik	-ɛɛk	-iak	-ek
*-um	-am	-um	-ɑm
*-up	---	-up	-ɑp
-un/-ul	-an	-un	-ɑn
*-ut	-at	-ut	-ɑt
*-uŋ	-uŋ	-uŋ	-oŋ
*-uk	-ɔɔk	-uk	-ok
*-uum	---	-uəm	-uom
*-uun	-ɔɔn	-ɔɔn	-uən
*-uut	---	-ɔɔt	-uət
*-uuŋ	-ɔɔŋ	-ɔɔŋ	-uoŋ
*-uuk	-ɔɔk	-ɔɔk	-uok

CHAPTER 7

PROTO-KRA

In this concluding chapter, we will summarize the system of Proto-Kra onsets, rimes, and tones. These are mainly based on the evidence and lower level reconstructions which have been discussed in chapters 3 to 6 of this study. Over 300 etyma arranged according to semantic areas will be provided in the last section.

7.1. Proto-Kra onsets

p	t	ʈ	ts	tʂ	tʃ	c	k	ʔ
b	d	ɖ	dz	dʐ	dʒ	ɟ	g	
m	n	ɳ				ɲ	ŋ	
w	l	r	z		ʒ	j	ɣ	
			s		ʃ		x	

In the following sections, supporting forms are mainly provided from three languages of different branches: Gelao (Wanzi), Laha (Nong Lay) and Paha. Other varieties and languages may be cited when the forms in the representative languages are lacking.

7.1.1. Voiceless obstruents.

Voiceless stops

These consonants generally show straightforward reflexes across languages. Evidence from Paha suggests that the sounds may appear as medials. They have become Paha voiced stops when preceded by an early nasal (symbolized by *m-) and become Paha spirants when preceded by other pre-initials (symbolized by *C-).

		Gelao	Laha	Paha	
fire	A1	pai	pəi	pui	*p-
three	A1	ta	təu	tuu	*t-
egg	A1	tan	tam	ðam	*ʈ-
old	B1	qa	kou	quu	*k-
water	C1	ʔəɯ	ʔuŋ	ʔɔɔŋ	*ʔ-
bran	B1	pau	paa	bwaa	*m-pw-
full	B1	tei	tik	dɛɛk	*m-t-
eye	A1	tau	taa	daa	*m-ʈ-
handspan	D1	---	ko (Lc)	gaap	*m-k-
male/husband	C1	po (Qs)	po (Lc)	vaau	*C-p-
fart	D1	tæ (Lz)	tɛ (Lc)	ðat	*C-t-
head louse	A1	ta	tou	ðhuu	*C-ʈ-
leg	A1	qau	kaa	ɣaa	*C-k-

Note: For the distinction between *m-t- and *m-ʈ-, cf. Gelao (Qs) /tai/ 'full' and /ze/ 'eye' respectively. Paha normally keeps *t- and *ʈ- separated (cf. 'three' and 'egg'), but the distinction has apparently been neutralized after prenasalization.

Voiceless sibilants

Sibilants may appear as initials or medials similar to stops. After a nasal onset in Paha, the fricative has become a stop, leaving a trace of its continuant quality as (aspirated>) breathiness of the reflex (*m-s- > mth- > dh-). Proto-Gelao palatal *c- is doubtful at this level, and may have developed from an earlier cluster, namely Proto-Kra *pj-. For example, 'paddy', PG *ca A1, Pubiao /pjee/ A1.

		Gelao	Laha	Paha	
two	A1	su	saa	θaa	*s-
buy	A1	sen	col	tɕɛn	*ts-
satisfied	B1	tshai	ci	---	*tʃ-
teach	A1	səɯ	tɕe (Lc)	---	*tʂ-
descend	C1	tsəɯ	cau	---	*c-
laugh	A1	sa	sɔ	ðhɯɯ	*C-s-
tooth	A1	sei (Lc)	cuŋ	jɔɔŋ	*C-tʃ-
rope	D1	tshei	---	jhuu	*C-ʃ-
hair	A1	san	sam	dham	*m-s-
pillar	A1	sa	cou	dzhuu	*m-tʂ-

7.1.2. Voiced obstruents

Early voiced obstruents may be divided into two sets. The stops (*b-, *d- and *ɖ-) are better recognized as implosives, which have become glottalized voiced stops (with tone series 1) in the Central-Eastern-Kra branch. Examples with the velar stop (*g-) are rare, and are mainly found in clusters with -j- or -w- (cf. 7.1.4.1). Voiced sibilants, on the other hand, remain voiced in all languages. This split development of early voiced obstruents may not be surprising. Constraints on the configurations and airstream needed in producing implosives make the sounds exclusively stop (and velar articulation disfavored).

Voiced implosives

		Gelao	Laha	Paha	
pluck	D	---	bət D2	ʔbit D1	*b-
do	A	tha A2	dəu A2	duu A1	*d-
crow (v.)	A	thaŋ A2	daŋ A2	ðaŋ A1	*ɖ-

shoulder	B	---	baa B2	maa B1	*m-b-
gall bladder	A	di A2 (Lz)	dəi A1 -t	nii A1	*m-d-
navel	A	zo A2 (Qs)	dau A2	naau A1	*m-ɖ-

Note: As in the case of voiceless stops, the distinction between alveolar and retroflexed stops appears to have been neutralized after prenasalization in Paha.

There are instances which may suggest medial *-d-. For example, 'forehead' *C-daŋ A: Gelao (Qs) tā A2, Laha daŋ B2, Paha ðaŋ A1, Pubiao ?daŋ A1. If the onset was a retroflexed initial *ɖ- (as might be hinted by the Paha reflex), the Gelao (Qs) reflex should be /z-/. Thus we may assume instead that Paha spirant /ð-/ have developed from an intervocalic *-d- (cf. PK *-t- > Paha ð-).

Voiced sibilants

Supporting evidence for voiced sibilants are uneven. While *ʒ- and *dʒ- may be reconstructed without difficulty, alveolar and retroflexed sounds are only found in a few examples. PG *ɟ-, like its voiceless counterpart *c-, may be doubtful at this level and may be alternatively considered as an approximant *j-.

		Gelao	Laha	Paha	
field	C2	zəɯ	haa B2	---	*z-
chopsticks	C/B	tsəɯ C2	dɔ B2	daau B1	*dz-
mountain	A2	tsha	tɕhi (Lc)	---	*dʑ-
younger brother	B2	tsəɯ	jau	juə (By)	*ʒ-
mosquito	A2	tɕhi	mjaaŋ B2	jaaŋ	*dʒ-
grandmother	C2	ʑɒ	ʑu (Lc)	jhaa	*ɟ-

7.1.3. Nasals

7.1.3.1. Nasals may also appear as initials or medials. Paha reflexes show tonal series 1 when preceded by a presyllable *C-, probably indicating that the pre-initials had become preglottalization of the nasals in this language. In other languages, the presyllables often dropped without trace (and the reflexes show tone series 2 according to the voicing of nasals). The nasal pre-initial *m-, if ever attested, must have become indistinguishable from the medial nasals.

		Gelao	Laha	Paha	
new	A2	mu	maal	maan	*m-
cow	A2	ntai	nəi	---	*n-
bird	D2	ntau	nok	nhook	*ɳ-
salt	A2	ɳtɕəɯ	ɳɔ	ɳɯɯ	*ɳ-
snake	A2	ŋkau	ŋaa	ŋaa	*ŋ-
bear	A2	mi (Lz)	mɛ	mii A1	*C-m-
thick	A2	ntau	naa	naa A1	*C-n-
yellow	C2	ɳtɕi	ŋil	ŋaan C1	*C-ŋ-

7.1.3.2. A set of voiceless nasals may be reconstructed in addition to voiced nasals. It is possible to hypothesize that the voicelessness has resulted from preceding onsets, namely *s-, but no concrete evidence has been found.

Within this set, there are also certain exclusive etyma which in Paha (and certain Gelao dialects such as Qiaoshang) show series 2 tones instead. We have temporarily reconstructed these with a velar pre-initial *x- based on the fact that it has caused the medial nasals from labial to become dorsal in some languages, e.g. Gelao (Qs) /ŋqwau A2/ 'dog' and /ŋqwa D2/ 'flea', while simply left as the voicelessness of the nasals in the other languages.

		Gelao	Laha	Paha	
belly	D1	---	---	mhɔɔk	*hm-
scold	B1	---	ɳa (Lc)	ɳhaan	*hɳ-
pillow	B1	ɳi (Lz)	ɳa (Lc)	ɳhii	*hɳ-
pus	B1	ŋka	ŋfiũ B2 (Lc)	ŋhuu	*hŋw-
nose	D1	ɳtce	ŋat D2	ŋhat	*hŋj-
flower	C1	ŋkau	---	ŋaa	*hŋ-
dog	A1	mpau	maa	maa A2	*x-m-
pig	A1	mpa	məu	muu A2	*x-m-
flea	D1	mpe	mat	mhat D2	*x-m-
six	A1	nan	dam (Tm)	nam A2	*x-n-

7.1.4. Resonants

7.1.4.1. Resonants as initials

Like nasals, the liquids may be voiced or voiceless. Examples of reconstructed *r- unfortunately lack related Laha forms, and might in fact belong to *d-r- (see 7.1.4.2).

		Gelao	Laha	Paha	
child	D2	lei	laak	lhaak	*l-
back/behind	A2	len (Lz)	lī (Lc)	lan	*l-
rotten	B2	zuŋ	---	ðhuŋ	*r-
bee	A2	zei	---	ðii	*r-
heart	C1	ləɯ	lul	lhin	*hl-
stomach	A1	luŋ	loŋ	loŋ	*hl-
cut	C1	han	---	ðan	*hr-
drink	C1	han	---	ðam	*hr-

Approximants are mainly found as medials. This preponderant occurrence of approximants is consonant with their place as the weakest members on the sonorant hierachy. Velar *ɣ- may be found as initial clustered with other approximant medials.

		Gelao	Laha	Paha	
sieve	A2	vi	vei (Lc)	vaaŋ	*gw-
wing	A2	vu	vaa	vaa	*gjw-
wind	A2	ven	van	vɯn	*gjw-
thin	C2	vu	---	vɛɛ (By)	*ɣw-
tendon	A2	ven	van	---	*ɣjw-

Note: Cf. Pubiao /Gɯəŋ/ 'sieve', /Gɯə/ 'wing', and /Ga/ 'thin (not thick)'.
Gelao (Lz) /vu/ 'sieve' but /ʑʏɯ/ 'wing' and /ʑu/ 'wind'. Also, /ɣwə/ 'thin (not thick)' but /zu/ 'tendon'.

7.1.4.2. Resonants as medials

Resonants may be preceded by obstruents and nasals. They may be completely clustered with the preceding onsets or may become initials by themselves (which then dominate the tones of the syllables) in modern languages. The former type may be considered as PK clusters, and the latter as PK presyllable plus medial.

Clusters

In clusters, the tonal series are normally assigned according to the voicing of the initials.

Labials as initials

		Gelao	Laha	Paha	
blood	D1	plɒ	plaat	pɛɛ	*pl-
silver	B1	phrə (Lz)	phjo (Lc)	phjaau	*pr-
die	A1	pen	phən	---	*pɣ-
duck	A2	blu (Lz)	---	---	*bl-
orphan	C2	blɑ̃ (Lz)	---	ʔbɔɔŋ C1 (By)	*bɣ-
peach	A1	plo (Lz)	---	baŋ	*m-pl-
carry	D2	blæ (Lz)	pfii (Lc)	mɛɛk D1	*m-bl-
bran	B1	pau	paa	bwaa	*m-pw-

Note: For contrast between *bl- and *bɣ-, cf. Gelao (Qs) /plo/ 'duck' and /vuŋ/ 'orphan' respectively. This is parallel with the case of *pl- and *pɣ- which respectively give Gelao (Qs) /ple/ 'blood' and /vlen/ 'die'.

Alveolars as initials

		Gelao	Laha	Paha	
nest	C1	tsɒ	to (Lc)	ðaau	*tr-
sweet	C1	tin	thəl	ʔjɛn (By)	*tj-
mortar	A2	tsha	---	ʔduu A1 (By)	*dr-
shallow	C2	zen (Qs)	dəl	ðan B1	*ɖj-
body louse	A2	tshen	mdal	nan A1	*m-dr-
moon	A2	zai (Qs)	daan	naan A1	*m-ɖj-
seven	A1	tɤu (Qs)	tho (Tm)	ðhuu	*C-tj-

Velars as initials

		Gelao	Laha	Paha	
grandson	A1	klu	klaal	ʔaan (By)	*kl-
close eye	D1	kle	klap	---	*kl-
road	A1	qen	hon	hun (By)	*kr-
house	A1	qɚ	kho (Lc)	qaan	*kr-
light (a.)	C1	xau	khaa	ghaa	*kʒ-
dry (a.)	B1	xau	khaa	ghaa	*kʒ-
iron	C1	tɕin	kɛl	qan	*kj-
hundred	A1	tɕin	kei (Lc)	qan	*kj-
throat	A1	qhai	kɛ (Lc)	qee (Pb)	*kɣ-
ginger	A1	qhei	khiŋ	qɣɛɛŋ	*kɣ-

Presyllabics plus medial

Grave consonants as onsets

In this type of onsets, the tones are normally assigned according to the voicing of resonant medials. The presyllable initials may be dropped, namely in Gelao varieties, or they may be kept as in Laha. In Paha, the medials usually cluster with the grave presyllable onsets, and the tones are assigned according to the voicing of the then initials (e.g. tones series 2 for *m-, and tones series 1 for *p-).

		Gelao	Laha	Paha	
daughter-in-law	B2	lai	mləi	---	*m-l-
face	B2	lau	m̩ (Lc)	mɦjɑɑ (Pb)	*m-l-
eight	A2	vla	mahu (Tm)	muu	*m-r-
afraid	A2	lau	blaa	pjaa A1	*p-l-
fish	A2	lau	blaa	pjaa A1	*p-l-

rock	A2	---	ɱn (Lc)	pɣaa A1	*p-r-
kill	A2	ven	phən	puan	*p-ɣ-
ear	A2	zau	khlaa	kaa A1	*k-r-
far	A2	lai	klәi	ðhii A1	*k-l-
tall	A2	vi	kwaaŋ	vhəəŋ A1	*k-(ɣ)w-

Alveolar obstruents as onset

Alveolars as presyllabic initial have slightly different histories. The *t-l- has become cluster *tl- which often further merged with *kl- in a number of languages (including the three representative varieties below). But Buyang shows an initial l- reflex with tone series 2 (contrasting with ?- < k- < *kl-), indicating early voicing at the time of the tone split, and suggesting that the complex onset had not completely become a cluster at the Proto-Kra level.

The voiced presyllable onset *d-l- has also become cluster kl- in Laha, but its original voicing contrast with *t-l- is shown by distinct tonal reflexes (i.e. *t-l- > kl- with tone series 1 and *d-l- > kl- with tone series 2). Similarly *d-r- has become kr- (with modern aspiration further induced by medial -r-).

		Gelao	Laha	Paha	
flow	A1	klai	klәi	qwi	*t-l-
sun	A1	klei	klaaŋ	qaaŋ	*t-l-
throat	A	?loŋ (Lz)	---	ðhoŋ	*t-r-
star	A2	zoŋ (Qs)	kluŋ	ðɔɔŋ	*d-l-
hawk	C2	li	klaaŋ	ðaaŋ	*d-l-
sick	C2	zai	khәi	ðii	*d-r-
crab	D2	---	khlaat	ðhaat	*d-r-

Liquids as onsets

There are also a few examples which may point to a liquid pre-initial plus stop medials. For these etyma, most languages show plain voiceless stops corresponding to Paha spirant reflexes, and thus suggesting medial stops of the type *C-p- and so on. The pre-initial *C- is decoded as a liquid for these roots based on reflexes in such languages as Niupo Gelao, e.g. /pla/ 'dream', /plɑŋ/ 'tooth' and /ʔlɯ/ 'mushroom'. Here we may assume that the liquid pre-initial and stop medial were metathesized in such dialects (e.g. l-p- > pl- and *l-k- > kl- > ʔl-), while the pre-initial has dropped in other dialects. (Cf. also PK clusters *pl- and *kl- for contrastive correspondences with those of this set).

		Gelao	Laha	Paha	
dream	A1	pan	pã (Lc)	van	*l-p-
tooth	A1	pan	---	---	*l-p-
mushroom	A1	qʏɯ (Lz)	ku (Lc)	qaa (Pb)	*l-k-

There are also other instances which may point to liquid pre-initials plus nasals. For these words, reflexes in Gelao varieties may simply point to PG clusters, namely *ml- or *mr-. But, since PK nasal pre-initial plus liquid, e.g. *m-l-, is reflexed as a cluster in Laha, it would be somewhat strange that Laha would have lost the liquid medial of an original cluster (i.e. *m-l- > ml-, but *ml- > m-). The pre-initial *r- may also be distinguished from *l- in this set of words, partly by some Gelao reflexes which retain retroflexion (cf. 'ghost'), and partly by the Paha breathy reflex with tone series 1 (*r-m- > *hm-).

		Gelao	Laha	Paha	
sesame	A2	ŋklau	---	ŋaa	*l-ŋ-
tongue	A2	mlõ (Lz)	maa	maa	*l-m-

frost	A2	mplai	mɒ (Lc)	mee (By)	*l-m-
ghost	A2	mpə-	kmaaŋ B2	---	*r-m-
five	A2	mpu	ma (Tm)	mhaa A1	*r-m-
drunk	A2	---	mɒ (Lc)	mhii A1	*r-m-

Note: For 'five', cf. also Laozhai Gelao /mlen/, Niupo /mluu/.

7.2. Proto-Kra rimes

7.2.1. Proto-Kra vowels

Monophthongs

i		u
e	ə	o
	a	

Diphthongs

ai	aɯ	au
	ui	

Proto-Kra has six monophthongs, which are similarly reconstructible at the lower proto-levels. In closed syllables, these six monophthongs have often developed into three pairs of vowels with contrastive length. In general, the mid vowels have become the short counterparts of their respective high or low vowels. This development appears to have occurred in most branches except Southern-Kra (Laha).

At least four diphthongs are reconstructible for Proto-Kra. Three of these, *-ai, *-aɯ and *-au, are also recognized in all branches. Diphthongs have not been found in closed syllables.

7.2.2. Proto-Kra finals

-m	-n	-ŋ
-p	-t	-k
	-l	

Seven well-supported endings are reconstructed for Proto-Kra. Three pairs of final nasals (*-m, *-n and *-ŋ) and stops (*-p, *-t, and *-k) have been kept very much intact in all languages but the Western-Kra. At Proto-Western-Kra level, the labial endings appear to have merged with alveolars. A number of Gelao and Lachi varieties have in fact further lost alveolar and velar endings as well. In the Jinchang Lachi variety, for instance, all nasal and stop endings have respectively become nasalization and constriction of the preceding vowels.

The liquid final *-l has been kept as such in certain varieties of Laha, otherwise it has merged with final *-n in most Southwestern-Kra languages. In the Central-Eastern-Kra branch, a Yalhong language has reflexed this final as -t, contrasting with -n for *-n, and thus offers additional supporting evidence for positing the final at the Proto-Kra level.

7.3. Proto-Kra tones

Three tones (*A, *B, and *C) have been reconstructed for Proto-Kra. An additional tonal category (*D) only occurs in syllables ending with stop consonants. This system of proto-tones has proved to be sufficient to explain in general the development of the various tonal systems in the modern languages, which now range from three to six tones.

In this section, we may take note of certain aspects of this proto-tone system. Some of these remarks should be considered highly hypothetical, and are not to be confused with the validity of the already established A-B-C tonal categories.

A. Tone C is usually accompanied by glottal constriction. This feature is especially prominent in Pubiao, Buyang, and Lachi languages, for example. We may consider the possiblity that the tone was originally accompanied by creaky or tense laryngeal state.

B. Reflexes of tone D are often the same as those of tone B. This is in fact a regular phenomenon in most languages but Pubiao. We may wonder what qualities these two tones shared which favored such a merger. One assumption is that syllables with these two tones are of medium length, neutral between the longer *A tone syllables (ending in vowels and sonorants) and shorter *C tone syllables (extra short because of the glottal catch).

C. Reflexes of tone *B are sometimes the same as those of tone *C. Some Gelao dialects and a Yalhong variety of Eastern-Kra have shown the same reflexes for tones *B and *C. (This kind of tonal phenomenon used to be taken as a specialty of the Be language of Hainan island.) Thus, in such dialects which have also shown the same reflexes for tones *B and *D, their tonal system may be considered originally a two-tone system with *A tone syllables contrasting with the other categories. It thus follows that tone *B, too, may have once been accompanied by a final feature of some sort, in addition to stop endings for tone *D and creaky for tone *C.

D. We may summarize the many aspects hypothesized for early tonal categories as follows:

	Endings	Duration	Vocal cords	Voicing
*A	sonorants, vowels	long	vibrating	voiced
*B	(lax larynx)?	medium	wide open	unvoiced
*D	stops	medium	closed	unvoiced
*C	tense larynx	short	closed	unvoiced

All of these qualities which accompanied tonal categories could have affected the development of the pitch, which later became the most prominent feature of the modern tones. We may thus assume that tones *B and *D may have merged in some languages if the duration quality was taken as most prominent; tones *C and *D may have merged in other languages if the closure of glottis was taken as decisive; and tones *B, *C and *D may all go together and contrast with tones *A in the other languages if the vibration of the vocal cords was taken as most significant. In sum, various types of tonal mergers in modern languages have been operating around such shared qualities of these mechanisms. These features, of course, can be further specified with finer details, e.g. medium-short (*D) versus medium-long (*B). This follows from the fact that, in languages which differentiate checked syllables into short (DS) and long (DL), it is often the DL tone which has merged with the B tone (e.g. the Jinchang Lachi and Langjia Buyang).

7.4. Proto-Kra etyma

In this last section, we provide as reference over three hundred Proto-Kra etyma arranged in ten semantic areas: I. body parts II. animals III. Plants IV. nature V. material culture (food, artifacts etc) VI. kinships and human relations VII. adjectives VIII. verbs IX. space and time X. numerals. Under each section, the roots are further listed in the alphabetical order of the glosses, except in the last section where numerals are listed from low to high numbers. For each gloss, forms from representative dialects of the six Kra languages are provided in the following order: Gelao (Wanzi), Lachi (Jinchang), Laha (Nong Lay), Paha (Yanglian), Buyang (E-Cun) and Pubiao (Pufeng). The Proto-Kra forms are put in the last column. For more details on dialectal forms and the reconstructions, readers are referred to the discussions in the previous chapters of this study.

I. Body Parts

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
armpit (1)	tɕi C1 (Lz)	tjạ C1	taai C1	taai B1 -t	---	---	*tai C
armpit (2)	---	---	---	---	lie A2	lfiii A2	*lje A
beard	men C2	---	---	---	muəm C2	muum C2	*mum C
belly	---	---	---	mfiɔɔk D1	---	ɱok D1	*hmok D
blood (1)	plɒ D1	pjo D1L	plaat D1	pɛɛ D1 -f	---	---	*plat D
blood (2)	---	---	---	---	haa C1	qaa C1	*kɣa C
boil (n.)	plɑu C1 (Lz)	---	---	---	---	pau C1	*plauɯ C
bone	taŋ D2	tfijɒ D2S	dak D2	---	---	ʔdak D1	*dək D
cheek/face	lau B2	ɱ B2	---	---	---	mfijɑɑ B2	*m-la B
chest	---	---	---	tak D1	tak D1	tak D1	*tək D
chin	---	kfiei C2 -t	kaaŋ C1	qaaŋ C1	ʔaaŋ C1	qaaŋ C1	*kaŋ C
ear	zau A2	lfiu A2	khlaa A2	kaa A1	ðaa A2	rfiɑɑ A2	*k-ra A
excrement (1)	qɒ C1	kạ C1	kai C1	qɛɛ B1 -t	---	---	*kai C
excrement (2)	---	---	---	---	ʔiak D1	ʔjek D1	*ʔik D
eye	tau A1	tju A1	taa A1	daa A1	taa A1	tee A1	*m-ʈa A
fart	tæ D1 (Lz)	tɛ̣ D1S	---	ðat D1	tut D1	tɑt D1	*C-tot D

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
fingernail	kle D1	lɛ̰ D1S	klәp D1	ɣap D1	lip D2	---	*ʈ-lep D
foot	---	kọ̰ D1S	kok D1	kɔɔk D1	---	---	*kok D
forehead	tã A2 (Qs)	---	daŋ B2 -t	ðaŋ A1	---	ʔdaŋ A1	*C-dәŋ A
gall bladder	di A2 (Lz)	---	dәi A1	nii A1	---	---	*m-di A
hair	mpe D2	mfiɛ̰ D2S	---	mfiɯt D2	---	---	*mot D
hair (head)	san A1	---	sam A1h	dfiam A1	θam A1	θam A1	*m-sәm A
hand	mpau A2	ɱ A2	maa A2	---	---	ɲii B1 -it	*mja A
head	klɒ B1	khja B1	xe B1 (Tm)	---	---	---	*krai B
heart	lәɯ C1	ljе C1	lul C1	lfiin C1	---	---	*hlul C
intestine	sai C1	ɕi C1	si C1	ðfiii B1 -t	---	θai C1	*C-si C
knee	qɤu B1 (Lz)	kwɛ B1	---	ʁoo B1	huu B2	qau B1	*C-ku B
leg	qau A1	ku A1	kaa A1	ɣaa A1	ʔaa A1	---	*C-ka A
liver	tæ D1 (Lz)	tjạ̰ D1S	tap D1	tap D1	tap D1	tjap D1	*tәp D
meat	ʔɒ C1	ʔọ̰ C1	ʔәu C1	ʔaau C1	ʔuә C1	ʔjau C1	*ʔaɯ C
mouth (1)	ŋku A2	---	---	---	ŋɔɔŋ A1	---	*ŋuŋ A
mouth (2)	---	---	mul B2	---	---	mɑn B2	*mul B
navel	zo A2 (Qs)	tfijo A2	dau A2	naau A1	ʔduә A1	nau A1	*m-ɖaɯ A

	Gelao	Lachi	Laha	Paha	Buyang	Pubiao	Proto-Kra
neck	---	ŋ̊ũ A2	ju A2	juɯ A1	jo A2	---	*C-jo A
nose (1)	ŋ̊tɕe D1	ŋ̊a D1	ŋat D2 -t	ŋhat D1	---	---	*hŋət D
nose (2)	---	---	---	---	tiŋ C1	taŋ C1	*teŋ C
pus	ŋka B1	ŋfiũ B2 -t	---	ŋhuu B1	muu B1	hau B1	*hŋwu B
saliva	tsa B1	---	---	ð(h)uu B1	tuu B2 -t	tau B1	*C-tu B
shoulder	---	pfiu B2	baa B2	maa B1	ʔbaa B1	ɱaa B1 -i	*m-ba B
skin (1)	qɒ B1	---	---	---	---	---	*kwau B
skin (2)	---	tu A1	taa A1	---	---	---	*ta A
skin (3)	---	---	---	---	ʔbuŋ A1	ʔboŋ A1	*boŋ A
stomach	luŋ A1	njũ A1	loŋ A1'	luŋ A1	luŋ A1	ɬoŋ A1	*hloŋ A
tear (n.)	tsau C2	ŋ̊fiũ C2	---	---	---	---	*ʒa C
tendon (1)	ven A2	võ A2	van A2	---	---	---	*ɣwjən A
tendon (2)	---	---	---	ŋ̊in C1-t	ŋ̊in A2	ŋfiʏn A2	*ŋen A
throat (1)	ʔloŋ A1 (Lz)	---	---	ðhoŋ A1	---	---	*t-roŋ A
throat (2)	qhai A1	kɛ A1	---	---	---	qee A1	*kɣe A
tongue	mlõ A2 (Lz)	nfijo A2 -i	maa A2	maa A2	mee A2	mfije A2	*l-ma A
tooth (1)	pan A1	---	---	---	---	---	*l-pən A

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
tooth (2)	---	sei A1	cuŋ A1	jɔɔŋ A1	θɔɔŋ A1	θuaŋ A1	*C-tʃuŋ A
waist	kla C1	ljɐ̯ C1	---	qu C1	---	ɬau C1	*t-lu C

II. Animals

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
ant	---	---	mot D2	---	mut D2	---	*mot D
bear	mi A2 (Lz)	mɒ A2	mɛ A2	mii A1	---	mɦje A2	*C-me A
bee	zei A2	---	---	ðii A2	---	rɦɑɑi A2	*re A
bird	ntau D2	njo̯ D2S	nok D2	nhook D2	---	nokŋ D2	*ɳok D
buffalo	---	kwɒ A1	---	---	---	qaai A1	*kwai A
cat (wild)	qa C1	kwɐ̯ C1	---	quu C1	ʔuu C1	qau C1	*ku C
chicken	qai A1	kɛ A1	kəi A1	qai A1	ʔai A1	qai A1	*ki A
cow	ntai A2	nĩ A1 -t	nəi A2	---	---	---	*ni A
crab	---	---	khlaat D2	ðhaat D2	---	---	*d-rat D
crow (n.)	ʔɒ D1 (Qs)	---	ʔaak D1	ʔaak D1	---	ʔaak D1	*ʔak D
deer	dzi D2 (Lz)	tɦje D2L	---	---	---	ʔdiet D1	*dit D

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
dog	mpau A1	m̩ A1	maa A1	maa A2	---	ɰ̃maa A1	*x-ma A
duck (1)	plo A2 (Qs)	---	---	---	---	---	*blaɯ A
duck (2)	---	ko D1L	kaap D1	---	ʔaap D1	qaat D1 -f	*kap D
egg	tan A1	tã A1	tam A1	ðam A1	tam A1	---	*ʈəm A
fish	lau A2	lfii A2 -v	blaa A2	pjaa A1	pjaa A1 -it	pfijɑɑ A2	*p-la A
flea	mpe D1	mą̀ D1S	mat D1	mhat D2	mat D1	ɰ̃mat D1	*x-məɬ D
goat	mæ C2 (Lz)	mfio C2	mɛ C2	mhii C2	---	---	*me C
hawk	li C2	lfii C2	klaaŋ C2	ðaaŋ C2	laaŋ C2	laaŋ C2	*d-laŋ C
horn	qa A1	kwɛ A1	kou A1	ɣuu A1	ʔuu A1	qau A1	*C-ku A
horse	ɳ̩tɕau C2	ŋ̀ C2	---	ŋaa C2	ŋaa C2	---	*ŋ̀ja C
louse (head)	ta A2 -t	tje A1	tou A1	ðhuu A1	tuu A1	---	*C-ʈu A
louse (body)	tshen A2	tfijã A2	mdal A2	nan A1	tɛn A2	nan A1	*m-drəl A
maggot	xe D1	kją̀ D1S	---	---	---	qat D1	*kʒəɬ D
monkey (1)	tɒ C1	---	---	taai C1	---	---	*tai C
monkey (2)	---	kho D1S	hok D1	---	---	ɽɔɔk	*krok D
monkey (gibbon)	---	---	mju A2 -m	---	ma luu A2	---	*m-lu A
mosquito	tɕhi A2	ʑi A2	mjaaŋ B2 -t	jaaŋ A2	jaaŋ A2	jaaŋ A2	*dʒaŋ A

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
pig	mpa A1	mje A1	məu A1	muu A2	muu A1	ɣuu A1	*x-mu A
rat	lɒ C1	ɭja C1	lai C1	---	---	---	*hlai C
shellfish	---	sɛ A1	ci A1	---	---	---	*tʃui A
snake	ŋkau A2	ŋ A2	ŋaa A2	ŋaa A2	ŋaa A2	ŋɦuɯ A2	*ŋa A
tiger	di A2 (Lz)	tɦje A2	kdəi A1	---	---	---	*(k-)di A
wing	vu A2	---	vaa A2	vaa A2	---	Guə B1 -t	*gwja A

III. Plants

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
banana	---	---	tok D1	---	tuk D1	---	*tok D
beans	tai C1	tjɒ C1	---	dii B1 -t	---	---	*m-te C
bran	pau B1	pu B1	paa B1	bwaa B1	faa B1	---	*m-pwa B
cogon grass	qe A1 (Qs)	ku A1	khaa A2 -it	qaa A1	ʔaa A1	qaa A1	*ka A
cucumber	tɕi A1 (Lz)	ti A1	tiŋ A1	dɛɛŋ A1	tiaŋ A2	---	*m-tiŋ A
ear of grain	qan A1	kã A1	---	ɣan A1	---	---	*C-kən A
flower (1)	ŋkau C1	---	---	ŋaa C1	---	---	*hŋa C

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
flower (2)	bi A2 (Lz)	---	baal A2	---	---	---	*bal A
fruit	mei D2	mfiĩ D2L	maak D2	maak D1	maak D1 -t	mjaak D2	*C-mak D
garlic (1)	ɕi B1 (Lz)	se B1	---	ðhɛɛ B1	θui B1	θei B1	*C-sui B
garlic (2)	qhau A1	---	---	---	---	---	*kɣa A
ginger	qhei A1	kei A1	khiŋ A1'	qɣɛɛŋ A1	ɕiaŋ A1	qeŋ A1	*kɣiŋ A
grass/tobacco	---	lo A1	klau A1	qaau A1	luə A2	---	*t-lauɯ A
leaf	zen A2 (Qs)	---	---	ðɛɛŋ A1	ʔdiaŋ A1	---	*ɖiŋ A
mushroom	qau A1	ku A1	---	---	---	qaa A1	*l-ka A
paddy (grain)	tsau A1	ʑe B1(?)	---	---	---	pje A1	*pja A
peach	plo A1	põ A1	---	baŋ A1	---	paŋ A1	*m-pləŋ A
rice (cooked)	mpəɯ C2	m̩m C2	mlaa C2	ŋ̊aa C2	---	mii C2	*mla(ɯ) C
rice (husked)	su A1	---	saal A1'	---	---	θaan A1	*sal A
rice	---	---	---	---	haaŋ A1	qxaaŋ A1	*kʒaŋ A
root	tsu A1 (Lz)	tɕi A1	caaŋ A1	tɕaaŋ A1	---	---	*tsaŋ A
seed	pa A1 (Qs)	pɒ A1	---	pii A1	pee A1	(pan A1)	*pe A
sesame	ŋklau A1	---	---	ŋaa A2	ŋaa A2	ŋfiɯɑ A2	*l-ŋa A
sorghum	tɕhi A2	---	---	jaaŋ C1 -t	jaaŋ A2	---	*ʒaŋ A

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
taro (1)	vɚ D2	---	haak D2	pɣaak D2	ðaak D2	---	*p-ɣak D
taro (2)	---	vfio C2	---	---	---	roo C2	*rwau C
thorn	ɳu C2	ŋfio C2	---	ŋaan C2	ɳaan C2 -i	ŋɯən C2	*ŋjan C
tree	tai A1	tje A1	təi A1	tii A1	---	tai A1	*ti A
vegetable (1)	luŋ A2	lfiũ A2	kloŋ A1	ðuŋ A2	---	---	*ɖ-loŋ A
vegetable (2)	---	---	---	---	ʔup D1	ʔap D1	*ʔop D
yam	mbø A2 (Qs)	mfia A2	mal B2 -t	man A2	man A2	mfiən A2	*məl A

IV. Nature

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
ash	ta B1	tje B1	thəu B1-i	duu B1	tuu B1	tau B1	*m-tu B1
coal	lʏɯ B2 (Lz)	---	---	---	laa B2	lfiɑɑ B2	*la B
cloud/fog	mpu D2	---	muk D2	mfiook D2	mok D2 -v	muak D2	*muk D
earth	la B2	---	---	---	luu B2	lfiuu B2	*lu B
earth (soil/mud)	---	ʔo D1L	---	---	ʔɔɔt D1	ʔuət D1	*ʔut D
field (wet)	---	nu A2 -v	naa A2	---	naa A2	nfiee A2	*na A

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
field (dry)	zəɯ C2	---	haa B2 -t	---	---	---	*za C
fire	pai A1	pje A1	pəi A1	pui A1	fii A1	pei A1	*pui A
firewood	---	ɕi A1	---	θuu A1 -v	θui A1	---	*sui A
frost	mplai A2	mɒ A2	---	---	mee A2	mfiɑɑi A2	*l-me A
hail	san D1	tɕẹ D1S	---	---	θi D1 -f	θap D1	*tsep D
iron	tɕin C1	kẹi C1	kɛl C1	qan C1	---	---	*kjəl C
moon (1)	zai A2 (Qs)	tfiju A2	daan A2	naan A1	ʔdaan A1	nin A1	*m-djan A
moon (2)	tsu A1	---	---	---	tjan C2 -t	taan A1	*(C-)tjan A
mountain	tsha A2	tɕfii A2	---	---	---	---	*dzu A
rain	mei A2	---	---	---	mun A2	mfiən A2	*mon A
rain	---	ɳfiã A2	jal A2	jin A2	(juət D2)	---	*jəl A
road	qen A1	khĩ A1	hon A1'	---	hun A1	qxwɑn A1	*kron A
rock (1)	klau B1	lju B1	---	---	---	---	*t-la B
rock (2)	ʔəɯ A1	---	---	---	---	---	*ʔuŋ A
rock (3)	---	ɱ A2	---	pɣaa A1	ðaa A2	pfijɑɑ A2	*p-ra A
sand	---	ɳa A1	ŋai A1'	---	---	---	*hŋai A
silver (1)	phrə B1 (Lz)	phjo B1	---	phjaau B1	---	phjo B1	*praɯ B

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
silver (2)	ɳin A1	---	---	---	ŋan A2	---	*ŋjən A
smoke	qɒ A1	kã A1	khwan B2 -it	ghan A1	---	---	*m-kwən A
snow	ntai A2	---	---	nii A2	---	nfiei A2	*ɳui A
star	zoŋ A2 (Qs)	lei A2	kluŋ A2	ðɔɔŋ A2	lɔɔŋ A2	lfiuuŋ A2	*d-luŋ A
sunlight	klei A1	---	klaaŋ A1	qaaŋ A1	---	ɬaaŋ A1	*t-laŋ A
sun	lø A2 (Qs)	vfiõ A2	van A1'	vhan A1	vən A1	wfiən A2	*(l-)wən A
water	ʔəɯ C1	ʔi̱ C1	ʔuŋ C1	ʔɔɔŋ C1	ʔɔɔŋ C1	ʔɔɔŋ C1	*ʔuŋ C
wind	ven A2	kfiue A2	van A2	vɯn A2	vən A2	---	*gwjən A

V. Material culture (Food, Artifacts et al)

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
ax	qu A1	ku A1	---	qɣaan A1	ʔaan A1	---	*kwan A
boat	---	thɯ (Bp)	thaa A2 (Tm)	---	ʔdaa A1	---	*da A
chopsticks	tsəɯ C2	tfijo B2	dɔ A2 -vt	daau B1	---	ʔdaau B1	*dzaɯ B/C
comb	tshai A1	---	---	ðhii A1	θee A1	---	*C-ʃe A
den/nest	tsɒ C1	tɳ C1	---	ðaau C1	---	θoo C1	*trau C

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
door	ŋka A1	ŋ A1	---	ŋɯɯ A2	---	---	*x-ŋo A
drum	ləɯ A2	li A2	---	---	lɔɔŋ A2	---	*d-luŋ A
hat (bamboo)	---	---	klop D1	---	lup D2	---	*t-lop D
house	qəˠ A1	kho A1	---	qaan A1	---	---	*kran A
ladder (1)	klai A1	---	---	---	---	---	*kwli A
ladder (2)	---	---	---	---	hɔɔŋ A1	quuŋ A1	*kɣuŋ A
liquor (1)	pa A1	---	pəu A1	---	---	pau A1	*plu A
liquor (2)	---	kɻ C1	---	ɣaa B1 -t	---	---	*C-ka C
medicine	---	lo A1	klau A1	qaau A1	luə A2	---	*t-laɯ A
mortar	tsha A2	---	---	----	ʔduu A1	---	*dru A
needle	lian D2	nfiɛ̱ D2S	---	---	ŋaat D2 -v	ŋɑtⁿ D2	*ŋlot D
pestle	---	---	caak D1	tɕaak D1	---	---	*tsak D
pillar	sa A1	tɕi A1	cou B2 -t	dʑhuu A1	θuu A1	tɕau A1	*m-tʂu A
pillow	ɳi A1 (Lz)	---	---	ɳhii A1	ɳee B1 -t	---	*hɳe A
rope	tshei D1	so D1L	---	jhu D1 -f	ɕaak D2	θaak D1	*C-ʃak D
salt	ɳtɕəɯ A2	ɳfiũ A2	ɳoo A2	ɳɯɯ A2	ɳoo A2	ɳfiũ A2 -f	*ɳo A
sieve	vi A2	vei A2	---	vaaŋ A2	vaaŋ A1 -t	Guaŋ A2	*gwaŋ A

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
skirt	ʔen C1	ʔi̱ C1	---	---	---	---	*ʔen C
thread	tsi B2	n̥ʃie B2	---	---	---	---	*ʒun B
village	mɒ A2	mja A2	---	mɣaai A2	---	---	*mɣai A

VI. Kinships, Pronouns and Human Relations

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
brother (elder)	tɒ A1	tja A1	---	---	---	---	*tai A
brother (younger)	tsəɯ B2	ʑfio B2	jau B2	---	juə B2	---	*ʒaɯ B
child	lei D2	lfii D2L	laak D2	lhaak D2	---	---	*lak D
father	phɒ A2	---	---	---	----	---	*ba A
father	---	po B1 -v	---	paa B1	paa B1	pee B1	*pa B1
female-in-law	lai B2	---	mləi B2	---	---	---	*m-li B
grandchild	klu A1	---	klaal A1	---	ʔaan A1	zaan A1	*klal A
grandfather	---	---	---	baau B1	puu B1	---	*m-pau B
grandmother	ʑɒ C2 -v	ʑfiu C2	jaa B1 -t	jhaa C2	jaa C2	---	*ja C
I (1)	ʔi A1	---	---	---	---	---	*ʔe A

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
I (2)	---	ki A1	---	kuu A1	kuu A1	kau A1	*ku A
male/husband	po C1 (Qs)	pọ C1	---	vaau B1 -t	---	---	*C-pauɯ C
male/husband	sæ A1 (Lz)	---	sɛ A1'	---	θee A1	ɕje A1	*se A
male-in-law	tsa C2	ʑi C2	---	jhuu C2	---	jau C2	*dʒu C
mother	mɒ C2	mɦja C2	---	mhai C2	mii C2	maai C2	*mai C
name	ntsai A2 -i	nje A2	---	---	---	nɦii A2	*n(ʒ)i A
orphan	blɑ̃ C2	---	---	---	ʔbɔɔŋ C1	ʔbuoŋ C1	*bɣuŋ C
sister (elder)	pai C1	---	---	pii C1	---	---	*pi C
sister (younger)	ʔen C1	---	ʔon C1	ʔɔɔn A1 -t	ʔun C1	---	*ʔon C
spirit	ŋku A2	ŋɦii A2	---	---	ŋɔɔn A2	ŋɦuən A2	*ŋun A
spirit	mpə̀ A2	mɦei A2	kmaaŋ B2 -t	---	---	---	*r-maŋ A
strength	tshen A2	ŋɦiã A2	---	---	---	---	*ʒan A
we	ta A1	te A1	---	dhuu A1	---	tɦuu A2	*t-ɣu A
who	nɒ C2	njo A1	---	nau A1	nɔɔ A2 -v	njau C2	*ʔ-nau A/C
you	mu B2	ʔm̩ C1 -t	maa B2	məə A2	maa A2	mɦii A2 -v	*mə A/B

VII. Adjectives

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
bitter	qan A1	kã A1	kam A1	qam A1	ʔam A1	---	*kəm A
black	lan A1	ljã A1	---	lham A1	ʔdam A1	ʔdam A1	*hl/dəm A
bright	---	---	ʔaaŋ C1	---	ʔaaŋ C1	---	*ʔaŋ C
deaf	ŋan C2	ŋ̊ʃia C2	ŋal C2	---	ŋatⁿ C2	ŋan C2	*ŋəl C
deep	laŋ D2	lʃijᵽ D2S	lak D1	lhak D1	lak D1	ɬak D1	*(h)lək D
drunk	---	mɒ A2	---	mhii A1	---	---	*r-me A
dry	xau B1	ku B1	khaa B1	ghaa B1	haa B1	qɣaa B1 -i	*kʒa B
far	lai A2	lje A2	klәi A2	ðhii A1	lii A2	qxai A2	*k-li A
fat	nan A2	nʃija A2	mnal B2 -t	nan A2	nɛn A2	nʃiin A2	*(m-)ɳəl A
full	tei D1	tʃii D2L -t	tik D1	dɛɛk D1	tiak D1	tek D1	*m-tik D
good	ʔɒ A1	ʔa A1	ʔai A1	ʔaai A1	---	ʔai A1	*ʔai A
heavy	xen A1	kjã A1	khal C1 -t	qan A1	han A1	qxan A1	*kʒəl A
hot	---	pi̯ C1	---	pɛɛŋ C1	---	---	*piŋ C
itchy	tau D2	---	dok D2	dɔɔk D1	ʔduk D1	---	*dok D
lazy	---	phĩ A1	---	pin A1	---	---	*pren A
light (not heavy)	xau C1	kũ C1 -f	khaa C1	ghaa C1	---	qxan B1 -f	*kʒa C

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
long	ʐˌ˥ C2 (Lz)	ʑfie C2	---	ðhii C2	ði C1 -t	---	*ri C
many	ʔai B1	---	ʔəi B1	---	---	---	*ʔi B
near	lau C2	lju C2	klaa B2 -t	ðaa C2	(θuə C1)	(tuu C1)	*d-la C
new	mu A2	mu A2	maal A2	maan A2	maan A2	---	*mal A
old (1)	qa B1	kwɛ B1	kou B1	quu B1	ʔuu B1	qau B1	*ku B
old (2)	kau C1	kẹ C1	---	kaa C1	ʔie B1	qee B1	*kja C/B
raw	te D2	tfijẹ D2	kthop (Tm)	---	ʔdip D1	ʔdap D1	*(k-)ɖep D
real	ŋkau B2	ɳfiã B2	---	---	---	ŋfiwɑ B2	*ŋ(w)a B
ripe	ŋka B1	ɳi B1	ɳəu B1 -i	muu B1	muu B1	---	*hŋwu B
rotten	zuŋ B2	---	---	ðhuŋ B2	---	---	*roŋ B
salty	naŋ B1	---	---	ðaŋ B1	---	---	*ʔ-ɳəŋ B
satiated	tshai B1	sɛ B1	cii B1	---	θii B1	---	*tʃi B
shallow	zen C2 (Qs)	tfiĩ C2	dəl C2	ðan B1	tiən B2 -it	ʔdan B1	*ɖjel C/B
short (≠ long 1)	ɳø C1 (Qs)	---	ɳan C1	---	---	---	*hɳan C
short (≠ long 2)	---	---	---	---	tii C2 -t	tai C1	*ti C
short (≠ tall)	te B1 (Qs)	---	taa C1	taa B1	taa C2 -t	---	*ta B/C
skinny	gɑu C2 (Lz)	kfiu C2	---	---	---	---	*gjaɯ C

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
sour	vlɒ D2	---	---	---	ʔdaat D1	bjaat D2 -t	*bwlat D
small	---	ʔi̱ D1S -v	---	ʔii D1 -f	ʔit D1	---	*ʔet D
smelly	mpa B2	mɦĩ B2	məu B2	mhuu B2	---	mɦuu B2	*mu B
sweet	tin C1	---	thəl C1	---	---	---	*tjel C
tall	vi A2	vei A2	kwaaŋ A2	vhəəŋ A1	vaaŋ A2	qɦɑɑŋ A2	*k-ɣwaŋ A
thick	ntau A2	nju A2	naa A2	naa A1	naa A2	nɦee A2	*C-na A
thin	vu C2	---	---	---	vɛɛ C2 -v	Gaa C2	*ɣwə C
warm (1)	ta C1	---	təu C1	---	---	---	*tu C
warm (2)	---	ʔũ B1 -v	---	---	ʔuən B1	ʔuən B1	*ʔun B
wet	---	---	---	---	ðak D2	rak D2	*rək D
white	zu D1	ʔi D1L	ʔuk D1	lɔɔk D1 -i	ʔɔɔk D1	---	*r-ʔuk D
yellow	ŋ̱tɕi C2	---	ŋil C2	ŋaan C1	ŋaan C2	ŋ̱in C2	*C-ŋil C

VIII. Verbs

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
afraid	lau A2	m̩ A2	blaa A2	pjaa A1	laa A2	---	*p-la A
alive	pləɯ C1	lị C1 -i	---	---	---	---	*pluŋ C
ask	sai C1	tɕị C1	cəi C1	---	---	---	*tsi C
bark (v.)	plɒ B1	---	plau B1	bau B2 -t	---	ʔbuu B1	*m-plau B
bathe	ʔɒ D1	---	ʔaap D1	ʔaap D1	---	---	*ʔap D
bite (1)	zei B1 (Qs)	tja B1	tai B1	ðaai B1	---	---	*ʈai B

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
bite (2)	zan C2	---	---	---	ðam C2	ram C2	*rəm C
buy	sen A1	tɕĩ A1	col A1	tɕɛn A1	---	---	*tsol A
carry on back (1)	pe C1 (Qs)	pu̱ C1	paa C1	---	---	---	*pa C
carry on back (2)	blæ (Lz)	pfii D2L	bik D1 -t	mɛɛk D1	---	---	*m-blik D
choose	ɬi B1 (Lz)	se B1	---	θii B2 -t	lee B2	---	*s-le B
close eye (1)	kle D1	---	klap D1	---	---	---	*kləp D
close eye (2)	---	---	---	---	nap D2	nap D2	*nəp D
come	mu A1	---	maa A2	---	---	ɱee A1	*(C-)ma A
come (return)	---	tfii A2	dɔŋ A2 -v	nɔɔŋ A2 -t	ʔdɔɔŋ A1	---	*m-duŋ A

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
crow (v.)	thaŋ A2	tfijõ A2	daŋ A2	ðaŋ A1	ʔdaŋ A1	ʔdaŋ A1	*ɖəŋ A
cut (1)	tai C1	---	tɛ C1	---	---	---	*te C
cut (2)	han C1	---	---	ðan C1	---	ɾan C1	*hrən C
descend (1)	tsəɯ C1	---	cau C1	---	---	---	*caɯ C
descend (2)	---	lfijũ A2	kloŋ A2	---	luŋ C2 -t	---	*d-loŋ A
die	pen A1	phĩ A1	phən A1'	puan C2 -t	---	---	*pɣon A
do	tha A2	tfije A2	dəu A2	ʔduu A1	ʔduu A1	---	*du A
dream	pan A1	pã A1	pan (Tm)	van A1	pan A1	pan A1	*l-pən A
drink	han C1	---	---	ðam C1	---	hɑm C1	*hrom C
dry in sun	tei D1	---	---	daak D1	taak D1	ɾaak D1 -i	*m-ɾak D
eat	---	kfio A2 -t	---	kaan A1	kaan A1	kən A1 -v	*kan A
fall	tau D1	tjọ D1S	tok D1	tɔɔk D1	tuk D1	tɔɔk D1 -v	*tok D
flow	klai A1	lje A1	kləi A1	qui A1	lui A2	ɬei A1	*t-lui A
forget	te D2	tfijạ D2S	dap D2	ʔdap D1	ʔdap D1	ʔdjap D1	*dəp D
give	ni D2	---	nak D2 -v	nhaak D2	naak D2	---	*nak D
get (1)	pɒ B1	---	---	---	---	---	*pwən B
get (2)	---	tju B1	---	duɯ B1	tuə B1	tuu B1	*m-to B

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
wear	lai C2	lɦjo C2	lɛ C2	lhii C2	lee C2	---	*le C
weep	---	ɳ̊ʃio D2L -v	ɳ̊it D2	ɳ̊hit D2	ɳ̊iet D1	---	*ɳ̊it D

IX. Space, Time and Deictics

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
above	---	---	---	---	luu A2	lɦuu A2	*lju A
back/behind (1)	len A2 (Lz)	lɦĩ A2	---	lan A2	---	---	*lon A
back/behind (2)	---	---	---	---	ʔdaŋ C1	ʔdaŋ C1	*dəŋ C
before/front	qəɯ A1	kwe A1	kun B2 -t	qɔɔn A1	ʔɔɔn A1	---	*kun A
below	---	ɳ̊i C2	ɳ̊un B2	---	---	---	*ɳ̊un B/C
day	ɣwo A2	vɦɔ̃ A2	van A1'	vhan A1	vən A1	wɦiən A2	*(h)wən A
inside	kləɯ C1	---	kluŋ C1	---	lɔɔŋ C2	---	*t-luŋ C
left	---	---	maaŋ A2 -t	mhaaŋ B2	---	mɦieŋ B2	*mjaŋ B
month	zai A2 (s̀)	tɦjo A2	daan A2	naan A1	ʔdaan A1	nin A1	*m-ɖjan A
outside	---	---	haai C2	---	ði C1	---	*ri C
right	---	---	---	mhit D2	---	ɲat^{n} D1	*(x-)mit D
that	nu B2 -i	---	ɳ̊aa C2	ɳ̊əə B1	ɳ̊aa C2	---	*ʔ-ɳ̊a C/B

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
see	qɒ A1	---	kai A1	qaai A1	---	---	*kai A
see (look)	---	---	təi C1	---	---	tai C1	*ti C
sell	sai A2	ve A2	vəi A2	θii A1	---	---	*s-gwi A
shake/shiver	---	sā B1	sal B1	---	θen B1	---	*səl B
sick	zai C2	kfiɣe C2	khəi C2	ði C2	ði C2	rai C2	*d-ri C
sleep (1)	ŋka B2	ŋɦii B2	---	ŋhuu B2	---	---	*ŋu B
sleep (2)	---	---	ʔou B1	---	ʔuu B1	ʔau B1	*ʔu B
smell	mpa B2	mfiī B2	məu B2	mhuu B2	---	mfiuu B2	*mu B
split (1)	plau B1	---	phaa B1	---	---	---	*pɣa B
split (2)	---	---	---	---	ʔdie B1	ʔdaai B1	*de B
steal	len C2	lfiī C2	---	lham C2	luəm C2	---	*lum C
steam (v.)	---	tɕi C1	---	tɕuu C1	---	---	*tsu C
swallow (v.)	lu C2	lfii A2	dəl C2 -v	---	lɔɔn A2	laan C2 -v	*d-ljal C/A
take off	klu D1	lja D1L	---	---	(θɔɔt D1)	---	*klut D
teach	səɯ A1	tɕe A1	---	---	θɔɔn A1	θuan A1	*tʂun A
wait	ŋkau A1	---	ŋaa A2	---	ŋuə A1	---	*hŋa(ɯ) A
walk	pai A1	pi A1	---	vhii A1	vii A2	---	*C-pji A

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
wear	lai C2	lfijo C2	lɛ C2	lhii C2	lee C2	---	*le C
weep	---	ŋfio D2L -v	ŋit D2	ŋhit D2	ŋiet D1	---	*ŋit D

IX. Space, Time and Deictics

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
above	---	---	---	---	luu A2	lfiuu A2	*lju A
back/behind (1)	len A2 (Lz)	lfiĩ A2	---	lan A2	---	---	*lon A
back/behind (2)	---	---	---	---	ʔdaŋ C1	ʔdaŋ C1	*dəŋ C
before/front	qəɯ A1	kwe A1	kun B2 -t	qɔɔn A1	ʔɔɔn A1	---	*kun A
below	---	ŋi C2	ŋun B2	---	---	---	*ŋun B/C
day	ɣwo A2	vfiɔ̃ A2	van A1'	vhan A1	vən A1	wfiən A2	*(h)wən A
inside	kləɯ C1	---	kluŋ C1	---	lɔɔŋ C2	---	*t-luŋ C
left	---	---	maaŋ A2 -t	mhaaŋ B2	---	mfiieŋ B2	*mjaŋ B
month	zai A2 (s̀)	tfijo A2	daan A2	naan A1	ʔdaan A1	nin A1	*m-ɖjan A
outside	---	---	haai C2	---	ði C1	---	*ri C
right	---	---	---	mhit D2	---	ɣat^{n} D1	*(x-)mit D
that	nu B2 -i	---	ŋaa C2	ŋəə B1	ŋaa C2	---	*ʔ-ŋa C/B

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
this	ni B2	njẹ C1	nəi C2	nii B1	nii C2	---	*?-ni C/B
year	plei A1	pfi A2 -t	phiŋ A1	mɛɛŋ A2	ðiaŋ A2	mfijɑɑi A2 -v	*m-(p)ɣiŋ A

X. Numerals

	Gelao	*Lachi*	*Laha*	*Paha*	*Buyang*	*Pubiao*	*Proto-Kra*
one	tʂ1 C1 (Lz)	tɕą̃ C1	cam C1	---	---	tɕja C1 -f	*tʂəm C
two	su A1	su A1	saa A1h	θaa A1	θaa A1	ɕee A1	*sa A
three	ta A1	tje A1	təu A1	tuu A1	tuu A1	tau A1	*tu A
four	pu A1	pu A1	paa B1 -t	paa A1	paa A1	pee A1	*pə A
five	mpu A2	m̩ A2	ma (Tm)	mhaa A1	maa A2	mfiɑɑ A2	*r-ma A
six	nan A1	nfija A2	dam (Tm)	nam A2	nam A1	ɲam A1	*x-nəm A
seven	tʏu A1 (Qs)	tje A1	tho (Tm)	ðhuu A1	tuu A2 -t	tuu A1	*C-tju A
eight	vla A2	ŋwɛ A2	mahu (Tm)	muu A2	ðuu A2	rfiɯɯ A2	*m-ru A
nine	səɯ B1	lfiju B2 -i	sa wa (Tm)	dhaa B1	vaa B1	ɕja B1	*s-ɣwa B
ten	pe D1	pɛ̣ D1S	pət (Tm)	vat D1	put D1	pɑt D1	*pwlot D
hundred	tɕin A1	kei A1	---	qan A1	---	---	*kjən A

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Abbreviations:

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BIHP	Bulletin of the Institute of History and Philology
ICSTLL	International Conference on Sino-Tibetan Languages and Linguistics

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