



UNIVERSITY *of* HAWAI'I®  

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MĀNOA

# PROTO-ONG-BE

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知之為知之，不知為不知，是知也。

*“Real knowledge is to know the extent of one’s ignorance.”*

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## ABSTRACT

This dissertation is a reconstruction of Proto-Ong-Be phonology using the comparative method. I propose that Proto-Ong-Be was tonal and monosyllabic, with the structure CV(:)(C), where a coda was optional and no consonant clusters were found in onset or coda positions. It had 34 onsets/initials (with tonal series), eight codas/finals, eight plain vowels (\*i, \*i:, \*u, \*u:, \*ə, \*ə:, \*a, and \*a:) and two diphthongs (\*ia and \*ua) that can be reconstructed with confidence. Proto-Ong-Be had six tones (A1, A2, BC1, BC2, D1, and D2), and this branch can be divided into two subgroups, Eastern-Ong-Be and Western-Ong-Be, based on shared innovations.

This study shows that the early voicing contrast associated with initials cannot be reconstructed based on Ong-Be data alone, but the loss of the earlier voicing contrast was compensated for at the suprasegmental level. The early vowel length distinction is reconstructible. None of today's Ong-Be languages has a vowel length distinction; however, it is possible that there was an earlier distinction based on regular sound correspondences and restricted distributions. The reconstructed vowels show that (1) long high vowels tend to break in open syllables, (2) short vowels are more likely to change than their long counterparts, and (3) peripheral vowels are more stable than central vowels in closed syllables.

With respect to consonants, the place of articulation of Proto-Kra-Dai stops plays a role in the voicing of Ong-Be reflexes, in which anterior stops are reflected with voiced stops, and dorsal stops (including palatalized velars) are reflected with voiceless stops. In all Ong-Be varieties that were surveyed in this dissertation, plain bilabial and alveolar stops became implosives in the onset position, which is an areal feature. Phonemic aspiration is reconstructed at the Proto-Ong-Be level.

## 摘要

本論文以「歷史比較法」為依歸，旨在重建原始臨高話的音韻系統。研究顯示原始臨高話乃一單音節聲調語言，其音節結構為「聲母＋（長短）元音＋（韻尾）」，且不允許輔音串。原始臨高話總共有三十四個聲母（含陰陽調）、八個韻尾、八個元音、兩個雙元音、六個聲調。臨高語支可細分為兩大方言區，分別為東部臨高方言及西部臨高方言，彼此無法相通。

本文認為單就臨高語群內部證據，無法重建原始聲母之清濁。然而，當代臨高語群完整保留陰陽調之分，進而支持三聲六調（平、上去、入，再分陰陽）之構擬。雖然長短元音之別，未見於當代方言，但依語音規律對應及分佈看來，元音長短在原始臨高話應有辨義作用。原始臨高話元音演變趨勢如下：（一）開音節裡的長高元音易裂化，（二）短元音比長元音不穩定，（三）閉音節中的央元音較其他元音易變。

本研究提出原始臨高話存有送氣塞音。此外，原始臨高話的濁內爆聲母，反映著原始侗台語字首的清雙唇塞音與清舌冠塞音，而原始侗台語字首的清舌背塞音（含顎化軟顎音），在原始臨高話裡，仍維持原樣。其中，臨高語群的雙唇塞音、齒齶塞音聲母內爆音化，實屬嶺南一帶的區域特徵。



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## Chapter 1. Introduction

This study reconstructs the phonology and lexicon of Proto-Ong-Be using the comparative method. In this dissertation, I propose that Proto-Ong-Be was monosyllabic, with the syllable structure  $CV(:)(C)^T$  which shows that Proto-Ong-Be had a contrastive vowel length and allowed no consonant clusters. The number of the tone categories in Proto-Ong-Be suggests that the voicing contrast in initials that triggers further tonal splits had been lost in Proto-Ong-Be which resulted in secondary tonal splits.

Generally speaking, Ong-Be consists of two languages in Hainan Province 海南省, one scattering in Haikou City 海口市 and northeastern Chengmai County 澄邁縣, and the other spoken in northwestern Chengmai County 澄邁縣, Lingao County 臨高縣 and the nearby regions of Danzhou City 儋州市. Ong-Be forms a small subgroup within the Kra-Dai language family which also includes the Hlai languages in central and southern Hainan.

In the past, grammatical sketches of Ong-Be focused mainly on the varieties of central-southern Lingao (Hashimoto 1980; Zhang et al. 1985; Liang & Zhang 1997; Liu 2000), and eastern Qiongshan (Zhang et al. 1985; Liang & Zhang 1997). This dissertation will provide phonological descriptions of additional Ong-Be varieties, including the less-well documented ones, to mend gaps in our understandings of contemporary Ong-Be. Since languages do not change suddenly, we might be able to gather some clues about general mechanisms of language change from Ong-Be where the surveyed varieties form a geographical continuum.

The reconstruction is based on lexical materials gathered in two fieldwork trips to Hainan, one in 2015 and the other in 2017. The majority of the data, elicited through a face-to-face conversation, are basic vocabulary. Most of my key consultants are between 55 and 75 years old, although one of them is in their early 30s. The majority of the elicitation sessions are recorded, and the audio recordings will be archived in the near future.

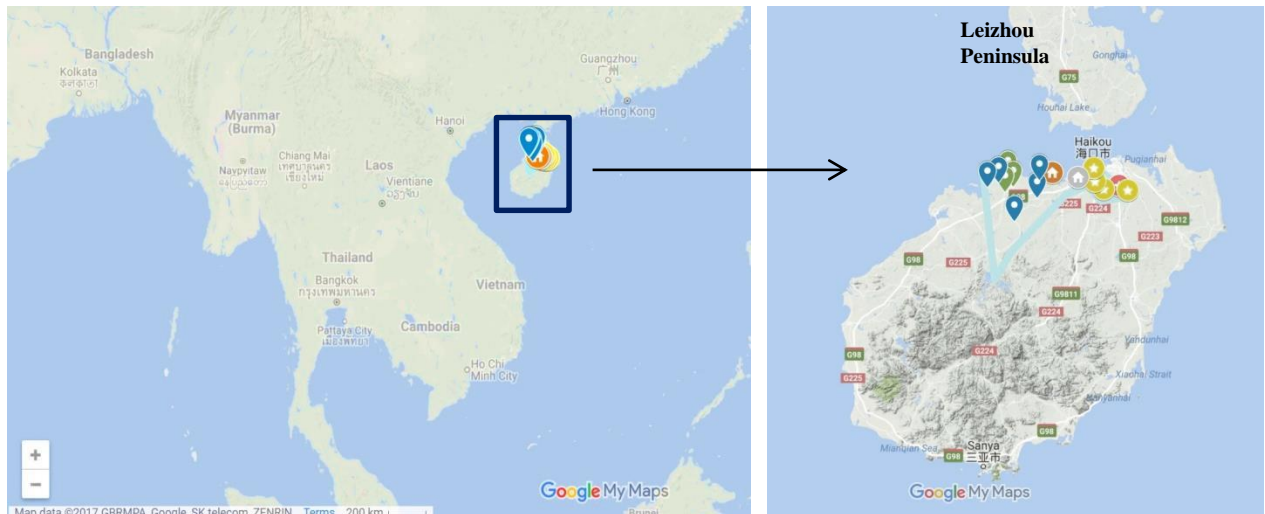
This dissertation consists of seven chapters. Chapter 1 is the Introduction, which includes the geographical distribution, mutual intelligibility, and a brief vitality assessment, followed by a review that details Ong-Be studies and tone studies in Chapter 2. Chapter 3 explores the phonologies of different Ong-Be varieties and divides Ong-Be into several subdivisions, while Chapter 4 deals with tone and internal subgrouping of Ong-Be and proposes that the Ong-Be branch can be divided into two subgroups. Chapter 5 and Chapter 6 focus on the reconstruction of the Proto-Ong-Be phoneme inventory. Chapter 5 suggests that an earlier voicing contrast in initials was already lost by Proto-Ong-Be, but the loss of which is compensated for in tonal contrasts, while Chapter 6 shows that Proto-Ong-Be has a vowel length distinction and the minimal word requirement. Chapter 7 presents the conclusion.

### **1.1. The geographical distribution of Ong-Be**

Ong-Be (ISO 639-3: onb; Glottocode: ling1262), also known as *Lingaohua* 臨高話, is a Kra-Dai branch spoken in the northwestern region of Hainan 海南, China (see Map 1). Hainan is located to the south of the Leizhou Peninsula 雷州半島 of Guangdong Province 廣東省, and is separated from Guangdong by the narrow Qiongzhou Strait 瓊

州海峡. Hainan was governed by Guangdong Province until 1988 when the island became a province of its own administratively. The capital of Hainan Province, abbreviated as Qiong 瓊, is Haikou City 海口市 situated at the mouth of the Nandu River 南渡江 in northern Hainan.

**Map 1: The Ong-Be speaking regions (adapted from Google Maps)**



It is to the west of the Nandu River that the majority of the Ong-Be speaking population live (see Map 2), specifically in the following places:

- Suburban regions of the capital Haikou 海口市:
  - Qiongzhan District 瓊山區: Longtang Town 龍塘鎮;
  - Xiuying District 秀英區: Changliu Town 長流鎮, Xixiu Town 西秀鎮, Shishan Town 石山鎮, Yongxing Town 永興鎮, and Zuntan Town 遵譚鎮;
  - Longhua District 龍華區: Longqiao Town 龍橋鎮 and Longquan Town 龍泉鎮;
- Chengmai County 澄邁縣:
  - Laocheng Town 老城鎮, Qiaotou Town 橋頭鎮 and Fushan Town 福山鎮;
- Lingao County 臨高縣;
- Danzhou City 儋州市:
  - Nanfeng Town 南豐鎮, Lanyang Town 蘭洋鎮, and Heshe Town 和舍鎮.

Due to administrative restructuring, the old place names and boundaries do not correspond to the contemporary ones. All of these adjustments in boundaries and names have made reading early materials challenging. Today's Qiongsan District 瓊山區 was formerly known as Qiongsan County 瓊山縣, with the county seat located in Fucheng Town 府城鎮, the former socio-political center of the area. Qiongsan County once governed Shishan Town 石山鎮, Yongxing Town 永興鎮, Longqiao Town 龍橋鎮, Longquan Town 龍泉鎮 and Longtang Town 龍塘鎮, which are part of the so-called Yangshan region 羊山地區 famous for volcanoes. Longquan Town 龍泉鎮 was formerly known as Shizilu Town 十字路鎮.

Certain villages located in between counties have been re-designated as well. For example, Fengnan Township 豐南鄉 of Haikou, where Ong-Be is also spoken, was included in Laocheng Town 老城鎮 of Chengmai County until 1995, and several villages of Huangtong Town 皇桐鎮 in Lingao County 臨高縣 were once ruled by Fushan Town 福山鎮 of Chengmai County 澄邁縣 until the 1950s. In addition, Maniao Township 馬袅鄉 of Lingao County is now part of Bohou Town 博厚鎮, and Meiliang Town 美良鎮 has been combined with Diaolou Town 調樓鎮. I was also told that some, if not all of the Ong-Be speaking areas in Danzhou City 儋州市, had belonged to Lingao County 臨高縣 until five decades ago.

**Map 2: Ong-Be speaking regions (adapted from Google Maps)<sup>1</sup>**

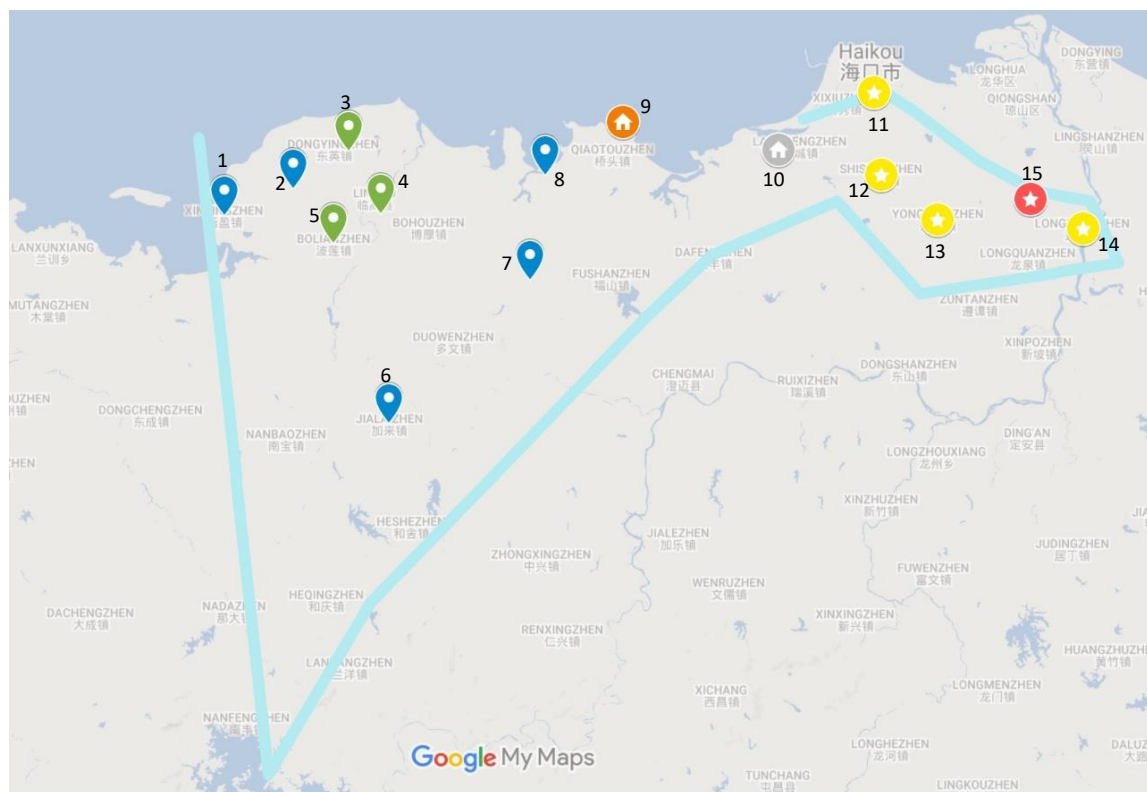


Table 1 presents a list of varieties that have been surveyed, exclusive of the publications on Ong-Be that are based on second-hand data, such as Hansell (1988) and Ostapirat (2005b). The numbers used here correspond to the numbers marked on Map 2.

<sup>1</sup> The varieties spoken in Lingao County 臨高縣, Chengmai County 澄邁縣 and Haikou City 海口市 (including former Qionghua County 瓊山縣) are marked with a circle, a house and a star, respectively. The colors blue, orange and yellow indicate the varieties I have investigated.

**Table 1: Locations that have been surveyed<sup>2</sup>**

#	Chinese Name	English Name	Surveyed by	#	Chinese Name	English Name	Surveyed by
1	新盈	Xinying	Hashimoto (1980); my fieldwork	9	橋頭	Qiaotou	my fieldwork
2	美良	Meiliang	my fieldwork	10	老城	Laocheng	Zhang et al. (1985)
3	東英	Dongying	Zhang et al. (1985)	11	長流	Changliu	Savina (by Haudricourt 1965); Xin (2008); my fieldwork
4	臨城	Lincheng	Jeremiassen (1893) <sup>3</sup> ; Liang & Zhang (1997)	12	石山	Shishan	Parker (1892); Xin (2011); my fieldwork
5	波蓮	Bolian	Liu (2000)	13	永興	Yongxing	my fieldwork
6	加來	Jialai	my fieldwork	14	龍塘	Longtang	Liang & Zhang (1997); my fieldwork
7	馬裊	Maniao	my fieldwork	15	龍橋	Longqiao	Zhang et al. (1985)
8	皇桐	Huangtong	my fieldwork				

## 1.2. Language names

Ong-Be /ʔaŋ<sup>3</sup> be<sup>3</sup>/, the term first recorded by the French missionary F. M. Savina with a focus on the Changliu variety, is the autonym which is composed of a prefix to mark human and the noun meaning “village”, hence “village people”. “Ong-Be” /ʔaŋ<sup>3</sup> be<sup>3</sup>/ as an autonym corresponds to /ʔaŋ<sup>3</sup> vo<sup>3</sup>/ in other Ong-Be varieties spoken outside Lingao and Danzhou. The term Ong-Be is commonly used in materials published outside China. By contrast, *Lingaohua* 臨高話 “Lingao language” is mostly used in Chinese academia, given that Lingao County has the largest Ong-Be speaking population. Note that in this dissertation, Ong-Be is used to refer to the entire branch, instead of a particular variety

<sup>2</sup> Also see Appendix I for the villages surveyed in my fieldwork. Place names of China are given in Hanyü Pinyin 漢語拼音.

<sup>3</sup> Jeremiassen did not specify which variety he investigated. Based on the phonology and the lexicon, Xin (2007:123) suggests that it is a variety closely related to Lincheng and/or the Ong-Be varieties spoken in central-south Lingao.



because earlier publications treat the Ong-Be cluster as a single language and use the same name ('Ong-Be' outside China and 'Lingao' in China) for different Ong-Be languages.

Although referred to as “cooked Li” (熟黎) in the early literature, which implies that these people are heavily Sinicized aboriginals, nowadays all the Ong-Be speaking people consider themselves Han Chinese in terms of ethnicity (Zhang et al. 1985; Liang & Zhang 1997). Except for Ong-Be in Lingao and Danzhou, Ong-Be varieties go by the Chinese name of the townships where speakers live. For example, Ong-Be used in Changliu Town and Qiaotou Town have the exonym *Changliuhua* ‘Changliu language’ and *Qiaotouhua* ‘Qiaotou Language.’<sup>4</sup> I have observed from my interviews that Ong-Be speakers from Haikou, Qiongsan, and Chengmai do not recognize themselves as belonging to the same linguistic community as their neighbors, which can be seen by the lack of a shared language name, even though these varieties are mutually intelligible. *Qiaotouhua* speakers, even though they have no problem understanding *Lingaohua*, do not consider their language *Lingaohua*. In contrast, speakers live in Lingao County and Danzhou City identify themselves as sharing the same group identity where people call their language /ko<sup>3</sup> lim<sup>2</sup> kɔw<sup>1</sup>/ ‘Lingao Language’ (lit. ‘language Lim Gao’).

Regardless of the regions, Ong-Be speakers all refer to Hainanese as /kaŋ<sup>3</sup> kʰɛk<sup>7</sup>/ ‘speak guest (language)’, as opposed to /kaŋ<sup>3</sup> vɔ<sup>3</sup>/ ‘speak village’, which appears to indicate that Ong-Be speakers arrived on Hainan prior to the Han Chinese (but after the

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<sup>4</sup> My Yongxing consultant also uses 本地話 or 地方話 ‘local language’ to refer to their language.

Hlai). Liang & Zhang (1996:5-8) further suggested that the Ong-Be-speaking population was not formed by a single migration from the mainland, or by a single ethnicity.

### 1.3. Mutual Intellegibility of Ong-Be varieties

*The Ethnologue* (Simons et al. 2017) listed all the Ong-Be varieties under a single ISO code (ISO 639-3: onb). To my knowledge, Chinese publications do not shed light on this issue. Zhang et al. (1985:92) stated that the difference between the Ong-Be varieties is so meager that these varieties are merely *tuyü* 土語 'lit. local vernaculars'.<sup>5, 6</sup> Liang & Zhang (1997:193) held the same position that the Ong-Be cluster is *tuyü* 土語. If two linguistic varieties are mutually intelligible to some degree, yet their speakers do not share a single group identity, it is possible to classify these two varieties as independent languages regardless of a relatively high degree of mutual intelligibility, following the example of Norwegian and Swedish. As is often repeated (origin considered uncertain), "a language is a dialect with an army and navy," and social or political factors may also influence language status assessment. In this section, mutual intelligibility, instead of cognate percentage, is adopted as the sole criterion in assessing the linguistic status of different Ong-Be varieties.

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<sup>5</sup>The original texts are as follows.

「從以上的比較來看，臨高話、澄邁話和瓊山話詞彙之間的差別是很小的，完全相同和有對應規律的詞都在 80% 左右，它們之間的差別只是土語間的差別，談不上方言間的差別，更不是什麼不同的語言。」

The translation is mine: Given the aforementioned comparisons, there is little difference among the vocabularies of *Lingaohua*, *Chengmaihua*, and *Qiongshanhua*. 80% of the lexical items are either identical or show regular correspondence in these languages. *Lingaohua*, *Chengmaihua*, and *Qiongshanhua* are merely *tuyü* ('local vernaculars'). They are not *fangyan*, nor distinctive languages.

<sup>6</sup> It seems that in terms of hierarchy, Zhang et al. (1985) consider *language* a level higher than *fangyan*, which is higher than *tuyü*. I suspect that with respect to linguistic terminology used outside China, a subgroup corresponds to Zhang et al.'s *fangyan*. Accordingly, 'macrolanguage' is Zhang et al.'s *language*, and what Zhang et al. called *tuyü* refers to anything below a subgroup which can be either a language or a dialect.

Since mutual intelligibility among speakers of different Ong-Be varieties remains to be determined, I conducted an informal Recorded Texts Test (RTT), recording a short narrative from speakers of Changliu 長流, Shishan 石山, Qiaotou 橋頭, Maniao 馬袅, and Jialai 加來 using the “Frog Story” (Mayer 1969). I then played different versions to speakers (1-4 speakers per variety; 2-3 times for each sentence) and asked them to explain to me the content of the story. I also interviewed a few speakers who have traveled to other Ong-Be speaking regions to see if they can understand the Ong-Be varieties used there.

As shown in Table 2, all the Ong-Be varieties in Lingao 臨高 appear to be mutually intelligible. My Jialai 加來 consultant stated that he could understand the Qiaotou 橋頭 version of the story, although not every word is intelligible to him. The Huangtong 皇桐 speakers have no problems understanding Qiaotou 橋頭 speakers, although they stated that “They [the Qiaotou speakers] have a strong accent.” The Huangtong 皇桐 and Qiaotou 橋頭 participants both mentioned that they could understand the Fushan 福山 variety in Chengmai 澄邁. It is thus safe to conclude that Xinying 新盈, Jialai 加來, Maniao 馬袅, Huangtong 皇桐, Fushan 福山 and Qiaotou 橋頭 are dialects of the same language. On the other hand, none of them can understand the content told by speakers from Haikou 海口 and Qiongsan 瓊山, although they were able to catch a few simple words/phrases after I showed them the “Frog story” and had them listen to the recording again.

**Table 2: Intelligibility (columns = accents; rows = speakers)<sup>7</sup>**

City/County	Lingao				Western Chengmai	Haikou	Qiongsan		
speaker accent	XY (新盈)	JL (加來)	HT (皇桐)	MN (馬裊)	QT (橋頭)	CL (長流)	SS (石山)	YX (永興)	LT (龍塘)
LT (龍塘)	N/A	No	No	No	No	Yes	Yes	Yes	Yes
YX (永興)	N/A	No	N/A	No	No	Yes	Yes	Yes	Yes
SS (石山)	N/A	No	N/A	No	No	Yes	Yes	Yes	Yes
CL (長流)	No	No	No	No	No	Yes	Yes	Yes	Yes
QT (橋頭)	Yes	Yes	Yes	Yes	Yes	No	N/A	N/A	N/A
HT (皇桐)	Yes	Yes	Yes	Yes	Yes	No	N/A	N/A	N/A
JL (加來)	Yes	Yes	Yes	Yes	Yes	No	N/A	N/A	N/A

My Longtang 龍塘 consultants have had contact with Lingao 臨高 speakers, and they stated that they could not understand the Ong-Be varieties there. I also played the “Frog Story” in Maniao 馬裊 and Jialai 加來 to other Longtang 龍塘, Yongxing 永興, and Shishan 石山 speakers, and they could not understand any of it either. All of this shows that the term ‘Ong-Be’ labels more than one language. Although Qiongsan 瓊山 speakers have no problem understanding each other, they all mentioned that the Changliu 長流 variety is very different from theirs and hard to understand, but not as unintelligible as those of Lingao County 臨高縣.

My Changliu 長流 consultant (late 60s) had been to Lingao County, and he stated that he could not understand their language at all. On the other hand, he was able to immediately recognize the Shishan 石山 accent after I played the recording of the “Frog Story”, whereas one of Changliu 長流 participants (late 20s) stated that the “Frog Story” in Shishan 石山 is undecipherable. Another young participant (late 20s), however, had

<sup>7</sup> In this table, “Yes” stands for mutual intelligibility and “No” for unintelligibility. N/A means that the information regarding the intelligibility between two particular varieties is not available because no tests or interviews were conducted.

no problem understanding the story. It is not clear to me at the moment if delayed intelligibility plays a role.<sup>8</sup> Even though Changliu 長流, Shishan 石山, and Yongxing 永興 all belong to the Xinying district 秀英區 of Haikou 海口, historically Changliu 長流, unlike the other two, was never part of the Yangshan region 羊山地區, which also reflects on how closely these varieties are related. I regard Changliu 長流 and other Qiongsan 瓊山 varieties as dialects of the same language for now.

This small-scale pilot study demonstrates that cognate percentages and mutual intelligibility are separate issues when determining linguistic status.<sup>9</sup> Compare this result with Zhang et al. (1985:122) who used cognate percentages to conclude that the Qiongsan, Chengmai, and Lingao varieties of Ong-Be form a single *language*,<sup>10</sup> and Liang & Zhang (1997:193) who used vocabulary and syntax to conclude that Ong-Be is not a *fangyan* ‘subgroup’.<sup>11</sup> I argue that Ong-Be itself is a branch consisting of at least two languages, each of which has multiple dialects.

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<sup>8</sup> The young participant who found the Shishan version unintelligible has little exposure to Ong-Be spoken outside Changliu. By contrast, the other two participants who can understand the “Frog Story” in Shishan have exposures to many languages through work. This could be why they were able to pick up the Shishan accent quickly.

<sup>9</sup> Special thank goes to David Bradley for pointing this out to me.

<sup>10</sup> The original texts are given below.

「臨高話」各土語間的詞彙差別很小，相同成份都在 80% 左右。……所以，臨高、澄邁、瓊山等地的是一種語言，不是多種語言。

The following translation is mine: The vocabularies of different ‘*Lingaohua*’ vernaculars show little difference, and 80% of the vocabulary are shared [among the vernaculars] ... For this reason, [we conclude that the vernaculars spoken in] Lingao, Chengmai and Qiongsan constitute a single language, not multiple languages.

<sup>11</sup> Liang & Zhang (1997:193) used vocabulary and syntax (such as word order) as the criteria for deciding whether varieties under discussion should be considered as a *fangyan*, i.e. a subgroup, by their standard. Whether a language cluster should be regarded as *tuyü* is solely based on phonological discrepancies across varieties. For this reason, they did not think Ong-Be should be classified as a *fangyan*. The original texts are given below.

#### 1.4. Language use

This section reviews the linguistic vitality of Ong-Be. These days, Standard Mandarin (普通話) is gradually replacing the role of Hainanese which has served as the local lingua franca for hundreds of years in Hainan. In the past, only educated people or people in business learned to speak Hainanese in the traditional Ong-Be speaking areas. Starting in 1949, those dwelling in the county seats of Haikou, Qionghua and Chengmai are at least able to speak Hainanese (Min) as a second language, besides their native tongue, while those in Danzhou speak *Danzhouhua* (Yue) as well. Because Hainanese has never been a lingua franca in Lingao County where *Lingaohua* is spoken, it is easier to find older monolinguals (of both genders) in Lingao County. Monolinguals can also be found in Haikou, Qionghua, and Chengmai, although the majority of them are women over 65 years of age. It is worth mentioning that the Ong-Be language cluster contains a Sinitic stratum with multiple layers, even though most of the pre-modern Ong-Be speakers did not seem to acquire a Sinitic language.

Ong-Be speakers below fifty years of age are all fluent in Mandarin Chinese. Ong-Be is used mostly in non-official domains, such as in markets, at home or with friends. I am aware of a few cases where adults have acquired Ong-Be as a second language after moving to Lingao County 臨高縣. Such a phenomenon is rare in other Ong-Be-speaking regions, although migrants might have developed passive knowledge of the local language. Based on my observations, in Changliu 長流, Shishan 石山, Yongxing 永興, Longtang 龍塘, Huangtong 皇桐, Maniao 馬袅, Xinying 新盈, Lincheng 臨城, and Jialai

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「我們對侗台語族諸語言方言、土語劃分的標準一般是根據詞彙、語法的異同程度來劃分方言，而根據語音的異同程度來劃分土語。... 我們沒有給臨高話劃分方言。」

加來, adults (above 30 years of age) are all fluent speakers of Ong-Be. However, the dominant language of children under 15 years of age is Mandarin, which is the medium of instruction and mass media. I was told that while some minors are active speakers of Ong-Be, their Ong-Be is colored by Mandarin. Several kindergarten children I encountered do not even possess a passive knowledge of Ong-Be.

Moreover, it is reported that language shift to Hainanese and Mandarin Chinese has already reached at its final phase in Laocheng Town 老城鎮 and Bailian Town 白蓮鎮 of Chengmai County 澄邁縣 where Ong-Be has ceased to be transmitted to later generations. Xin (2008:35) also reported that dozens of Ong-Be villages in Haikou, i.e., the so-called ‘Fifteen villages’ 十五村<sup>12</sup> of Xiuying District 秀英區, as well as three other villages on the Xinbu Island 新埠島, have abandoned their heritage language, completely shifting to Hainanese and/or Mandarin.

Table 3 summarizes language use of various age groups born after the 1940s. Bear in mind that these results only intend to show the status quo reported by the people I have talked to. For the group age 60 and above, Mandarin is learned only by educated people working as school teachers or government officials. For this age group, the ability to speak Hainanese is absent in Lingao County, and in Changliu, Qiongsan and Chengmai it is mostly confined to people who (1) are educated, (2) have run a business, (3) have been in frequent contact with outsiders, or (4) have lived in county seats.

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<sup>12</sup> These people were referred to as ‘The Li of the fifteen villages’ 十五村黎 in early materials.

**Table 3: Language use<sup>13</sup>**

<b>Townships</b>	<b>60 and above</b>	<b>40 - 60</b>	<b>20 - 40</b>	<b>20 and below</b>
<b>Longqiao</b> (龍橋)	Ong-Be; Hainanese; (Mandarin)	Ong-Be; Hainanese; Mandarin	Mandarin; Ong-Be; Hainanese	Mandarin; (Ong-Be)
<b>Longtang</b> (龍塘)	Ong-Be; Hainanese; (Mandarin)	Ong-Be; Hainanese; Mandarin	Mandarin; Ong-Be; Hainanese	Mandarin; (Ong-Be)
<b>Yongxing</b> (永興)	Ong-Be; Hainanese; (Mandarin)	Ong-Be; Hainanese; Mandarin	Mandarin; Ong-Be; Hainanese	Mandarin; Hainanese; (Ong-Be)
<b>Shishan</b> (石山)	Ong-Be; Hainanese; (Mandarin)	Ong-Be; Hainanese; Mandarin	Mandarin; Ong-Be; Hainanese	Mandarin; (Ong-Be)
<b>Changliu</b> (長流)	Ong-Be; (Hainanese) <sup>14</sup> ; (Mandarin)	Ong-Be; Mandarin	Mandarin; Ong-Be	Mandarin; (Ong-Be)
<b>Laocheng</b> (老城)	Ong-Be; Hainanese; (Mandarin)	Hainanese; Ong-Be; Mandarin	Mandarin; Hainanese; (Ong-Be)	Mandarin; (Hainanese)
<b>Qiaotou</b> (橋頭)	Ong-Be; Hainanese; (Mandarin)	Ong-Be; Hainanese; Mandarin	Mandarin; Hainanese; Ong-Be	Mandarin; (Ong-Be); (Hainanese)
<b>Huangtong</b> (皇桐)	Ong-Be; (Mandarin)	Ong-Be; Mandarin	Ong-Be; Mandarin	Mandarin; Ong-Be
<b>Maniao</b> (馬袅)	Ong-Be; (Mandarin)	Ong-Be; Mandarin	Ong-Be; Mandarin	Mandarin; Ong-Be
<b>Lincheng</b> (臨城)	Ong-Be; (Mandarin)	Ong-Be; Mandarin	Ong-Be; Mandarin	Mandarin; Ong-Be
<b>Xinying</b> (新盈)	Ong-Be; (Mandarin)	Ong-Be; Mandarin	Ong-Be; Mandarin	Mandarin; Ong-Be

As for those aged 40 to 60, they are generally educated. Hence, besides their native language, they have acquired Mandarin, which is the *de facto* medium of instruction beginning in middle school. Because Mandarin is acquired as a second language for

<sup>13</sup> Languages are given in order of speakers' fluency. Parentheses indicate that the language(s) is not widely spoken in that region by that age group.

<sup>14</sup> Savina lived in Hainan from 1925 to 1928, according to J. Michaud (2006:209). Savina (1965:10) commented on language use in Changliu as follows.

'Tous les Ong-Bê parlent le hoclo qui est la langue commerciale de la région. Le Bê n'est guère parlé que dans l'intérieur des villages et dans les familles, et il ne tardera probablement pas à disparaître.'

The following translation is mine: All the Ong-Bê speak Hainanese (Hoclo) which is the trade language of the region. Bê is only spoken in the villages and within families, and it probably will not take long before it disappears.



this age group, in elementary school teachers employed Ong-Be or Hainanese as the medium in class as well. As shown in the table, in Lingao County 臨高縣 and Changliu Town 長流鎮 (of Haikou) there is still no need for people to converse in Hainanese.

Adults aged 20 to 40 all speak Mandarin, and the ability to speak Hainanese is not uncommon in Qiongsan and Chengmai, especially for people dwelling in county seats. Although Ong-Be is still acquired by this age group, it has ceased to be transmitted in many households in Laocheng. People under 20 use Mandarin predominantly, and it varies from family to family as to whether Ong-Be is taught to children. Due to a shared group identity and homogeneity, Ong-Be in Lingao might be able to survive longer. In addition, owing to the current developing infrastructure, such as paved roads leading to villages, the living quality has generally been improved, which facilitates language shift under socio-economic pressure. The pervasive use of mass media and the internet also plays a role in language shift and loss.

In short, the linguistic reconstruction of Proto-Ong-Be is faced with the further complication that certain lexical items employed for the reconstruction might soon disappear from speakers' vocabularies, due to changing lifestyles and language shift. For instance, people's lexical knowledge of flora and fauna is shrinking; traditional practices of weaving, fishing, and farming have been largely replaced by modern technologies, and relevant vocabulary replaced by lexemes borrowed from the dominant languages. The rapid societal changes in southern China have had a great impact on traditional lifestyles, as well as on intergenerational transmission of non-official languages. Although the speaker numbers remain high and the vitality of Ong-Be is robust among adults, the domains of use show signs of decreasing among younger

adults and school students. Ong-Be has a low intergenerational transmission rate and is in general not used by children under 15 years of age as their dominant language if it is acquired by them at all.

## Chapter 2. Literature review

This chapter first reviews the linguistic classification of Ong-Be and the language family it belongs to, followed by a discussion of syllable structure. Publications on synchronic and diachronic aspects of Ong-Be and the reconstructions of Proto-Ong-Be will be examined in sections 3 and 4. Section 5 provides an overview of tonal developments in (South)East Asia.

### 2.1. Previous studies on the linguistic classification of Kra-Dai and Ong-Be

This section reviews the previous discussions concerning the linguistic classification of Kra-Dai and Ong-Be. Chinese scholars tend to consider the Kra-Dai language family, to which Ong-Be belongs, as a part of Sino-Tibetan. However, the resemblances between Kra-Dai and Sinitic have been ascribed to typological factors and lexical borrowing by most non-Chinese linguists, because little, if any, evidence can be used to demonstrate a genetic relationship between Kra-Dai and Tibeto-Burman languages (see Ostapirat 2017a and 2017b for a detailed review of the Sino-Tai hypothesis).<sup>15</sup> In addition, the Sinitic words found in Kam-Sui and Tai, which are in close contact with the Chinese, are often absent in Hlai or Kra, both of which belong to the first-order branches in Kra-Dai. Those Sinitic words are not reconstructible to Proto-Kra-Dai, and should be regarded as loans. Considering the basic vocabulary, there is no doubt that although Ong-Be speakers are classified as Han Chinese by the government in terms of nationality, their

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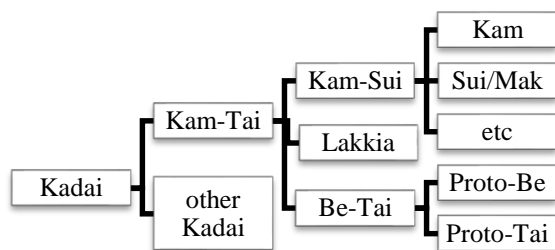
<sup>15</sup> The Sino-Tibetan language family is traditionally, although not uncontroversially, divided into the Sinitic branch and the Tibeto-Burman branch. If Kra-Dai were genetically related to Sino-Tibetan languages, but was not a subgroup within the Sinitic branch, we would expect to see cognates exclusively shared between Kra-Dai and Tibeto-Burman, but this is not the case. The lexical evidence certain scholars claim to support the genetic relationship between Kra-Dai and Sinitic is best attributed to borrowing.

language is Kra-Dai, not Sino-Tibetan, cf. Zhang et al. (1985:8-10), and Liang & Zhang (1997:1).

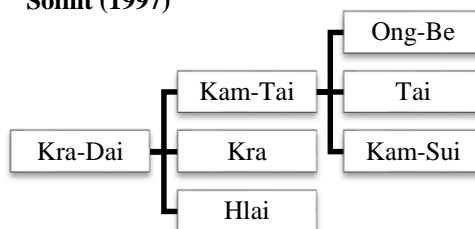
Within the Kra-Dai language family, scholars have divergent opinions regarding subgrouping. Edmondson & Solnit (1997) divided Kra-Dai into three primary branches – Kam-Tai, Hlai, and Geyang (Kra). Ong-Be is traditionally placed under Kam-Tai (Hansell 1988; Edmondson & Solnit 1997; Ostapirat 2000; among others) although details concerning the internal subgrouping of Kam-Tai have never been worked out. Hansell (1988) proposed that Ong-Be forms a Be-Tai sub-branch under the Kam-Tai node. Norquest (2015:3) placed Ong-Be with Tai to form a Tai-Be sub-branch under his West Kam-Tai subgroup, but Norquest (2007) regarded Ong-Be as a subgroup under the Be-Tai node within his Southern Kra-Dai branch. On the other hand, Ostapirat (2005a) considered Ong-Be a primary branch in the Kra-Dai language family, whereas Ostapirat (2017c) placed Ong-Be under the Kam-Tai node. The classification of Ong-Be within the Kra-Dai language family is beyond the scope of this dissertation because it requires reconstruction(s) above the Proto-Ong-Be level; hence it will not be addressed in this study.

**Figure 1: The Kra-Dai language family trees**

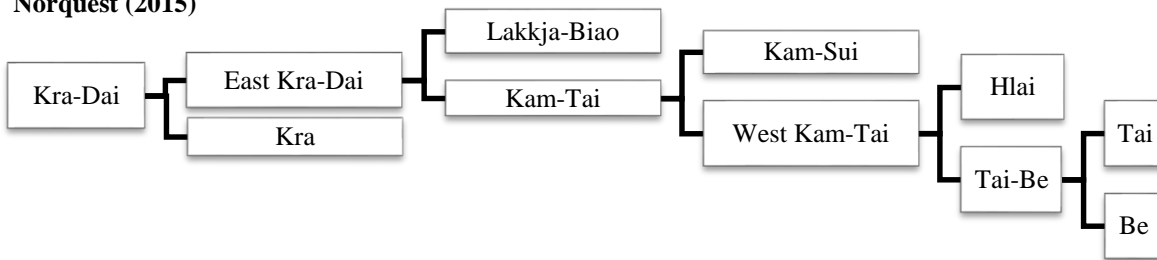
**Hansell (1988)**



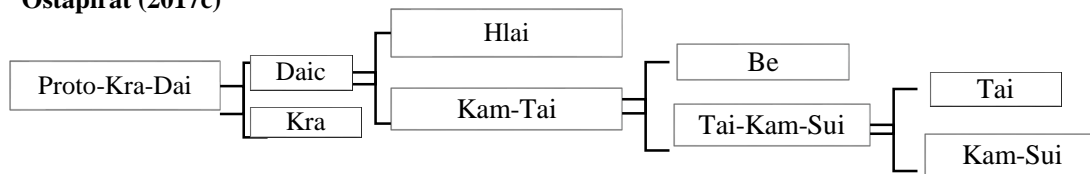
**Edmondson & Solnit (1997)**



**Norquest (2015)**



**Ostapirat (2017c)**



Ong-Be has a Sino-Ong-Be stratum composed of multiple layers in addition to its native Kra-Dai lexicon, which has made its linguistic status controversial. Stübel (1937), Woon (1979), and Liu (2000:9) even considered Ong-Be a mixed Sinitic language.

Nevertheless, Ong-Be is unlikely to be a mixed language because a mixed language, which generally arises from widespread bi- or multilingualism in its source languages, is more likely to serve as an in-group identity marker than a lingua franca (see Meakins 2013). On the contrary, Ong-Be speakers do not share a single group identity.

Monolingual speakers of Ong-Be are generally assumed to have been common in the past, and are not uncommon now among people above 65, especially those who are uneducated or rarely come into contact with non-Ong-Be speakers. Ong-Be had been the lingua franca only in Lingao County, where everyone, regardless of their linguistic background, had to learn to speak Ong-Be for communicative purposes.

In addition to the Sino-Ong-Be stratum, Norquest (2015:2) mentioned that Ong-Be has a Mon-Khmer substratum without going into details. Such a “substratum”, nonetheless, is likely to be the result of indirect borrowing via Hlai which was once in contact with Mon-Khmer languages in Northern Vietnam (Ostapirat 2017, p.c.).

In short, Ong-Be is a Kra-Dai subgroup, not a Sinitic language or a mixed language, although it contains a Sino-Ong-Be stratum of loanwords. And the linguistic position of Ong-Be within the Kra-Dai family remains a matter of dispute.

## **2.2. Previous studies on the language structure of Kra-Dai and Ong-Be**

This section provides an overview of the syllable structure of modern Kra-Dai languages, a majority of which are monosyllabic, of several Kra-Dai proto-languages, which are predominantly sesquisyllabic, as well as of the structure of Proto-Kra-Dai, which is reconstructed using a disyllabic model.

A majority of modern Kra-Dai languages are monosyllabic, accompanied by rich tonal systems. Consonant clusters in the onset position are allowed in certain Kra-Dai languages, e.g., Thai /pla:<sup>A1</sup>/ ‘fish’ and Gelao /klau<sup>B1</sup>/ ‘rock’.<sup>16</sup> The coda position, in contrast, permits only a single segment, as /ru:l<sup>C2</sup>/ ‘hot, spicy’ in Saek (Tai), /mat<sup>D1</sup>/ ‘flea’ in Buyang (Kra), and /kin<sup>A1</sup>/ ‘to eat’ in Thai.<sup>17</sup> Phonemic vowel length distinctions can also be observed in many Kra-Dai languages, as illustrated by /ta:k<sup>DL1</sup>/ ‘land leech’ and

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<sup>16</sup> The raised A, B, C, and D refer to the Kra-Dai tone categories. The raised numerals, <sup>1</sup> and <sup>2</sup>, indicate respectively a voiceless and a voiced initial at the time of the tonal split; also see Table 26.

<sup>17</sup> The sources of Kra-Dai languages cited in this paper are as follows: Lincheng (Liang & Zhang 1997), Bolian (Liu 2000), Gelao and Buyang (Ostapirat 2000), Thai and Saek (Pittayaporn 2007), Proto-Tai (F. Li 1977; Pittayaporn 2009), Proto-Kam-Sui (Thurgood 1988; Ostapirat 2006), and Proto-Hlai (Ostapirat 2004; Norquest 2007). A few of the Changliu, Longtang and Xinying data are from Xin (2008), Liang & Zhang (1997), and Hashimoto (1980), where they are marked respectively as Xin, L&Z, and Hashimoto. LC stands for Lincheng (臨城) from Liang & Zhang (1997), and BL for Bolian from Liu (2000). All the remaining Ong-Be data are based on my own fieldwork unless otherwise specified.

/tak<sup>DS1</sup>/ ‘grasshopper’ in Yay (Tai), and \*tuk<sup>7</sup> ‘to drop, fall’ and \*tu:k<sup>7</sup> ‘to wrap, bundle’ in Proto-Kam-Sui. Although Ostapirat (2000) did not reconstruct phonemic vowel length for Proto-Kra, a phonemic vowel length distinction is found in Proto-Tai (Pittayaporn 2009), Proto-Kam-Sui (Thurgood 1988), and Proto-Hlai (Ostapirat 2004; Norquest 2007).

Regardless of the fact that almost all of the modern Kra-Dai languages are monosyllabic, Proto-Kra-Dai is very likely to have been disyllabic (Ostapirat 2018). The reconstructions of the three branches of the Kra-Dai languages, i.e., Proto-Hlai (Ostapirat 2004; Norquest 2007), Proto-Kra (Ostapirat 2000), Proto-Kam-Sui (Ostapirat 2006) and Proto-Tai (Pittayaporn 2009) all support disyllabicity or sesquisyllabicity. Sesquisyllabicity, first proposed by Matisoff (1973), refers to a two-syllable prosodic word where a pretonic syllable is followed by a tonic syllable. The former is also called a minor syllable which is unstressed with a reduced vowel quality or limited contrastive vowels, while the latter is regarded as a major syllable which is stressed and with full vowel contrasts. Matisoff (1973) thus considered a minor syllable a half syllable, instead of a full one. However, the phonotactics of a minor syllable varies from language to language. In Mon-Khmer languages, it is possible for a minor syllable to have onset clusters or a coda consonant (Thomas 1992), cf. the Buyang cluster of Kra-Dai, which allows only a limited set of vowels and no coda or onset clusters in the minor syllable (J. Li 2000).

Since monosyllabic words in modern Hlai, Kra, and Tai can only be explained by direct inheritance from ancestors with di- or sesquisyllabic words, the Kra-Dai language family must have undergone a transition from di- or sesquisyllabicity to monosyllabicity. Some scholars propose that Kra-Dai has a distant genetic relationship with Austronesian

(Benedict 1942, 1975; Sagart 2004; Ostapirat 2005a, 2013). If that is the case, Proto-Kra-Dai must have gone from disyllabicity to sesquisyllabicity at one point before further being reduced to monosyllabicity. Up to the present date, no consensus Proto-Kra-Dai reconstructions are available.

All modern Ong-Be varieties are monosyllabic and tonal. No consonant clusters are allowed in the onset or coda. No phonemic vowel length distinction has been attested. It is uncontroversial that Proto-Ong-Be was tonal, since regular tonal correspondences between Ong-Be and other Kra-Dai languages can be demonstrated. Norquest (2007) adopted a sesquisyllabic model for the reconstruction of Proto-Ong-Be, whereas the discussions in Ostapirat (2005b) reflect a monosyllabic Proto-Ong-Be with a voicing contrast. Complex onsets, although proposed in Norquest (2007), are absent in Ostapirat (2005b) and Chen (2015). In addition, both Norquest (2007) and this study propose a vowel length distinction for Proto-Ong-Be.

### **2.3. Previous studies of the contemporary Ong-Be varieties**

This section surveys studies regarding contemporary Ong-Be varieties, which include Savina (1965), Hashimoto (1980), Zhang et al. (1985), Liang & Zhang (1997), Liu (2000), and Xin (2006, 2007, 2008, 2011). According to Xin (2007), the earliest modern documentation of the Ong-Be languages was carried out by the British barrister Edward Harper Parker (莊延齡) and the Danish missionary Carl C. Jeremiassen (治基善), dating back to the late nineteenth century, where Parker (1892) investigated the Shishan (石山) variety<sup>18</sup> and Jeremiassen surveyed a variety spoken in Lingao County (臨高縣). Later

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<sup>18</sup> It was called 'Kheng-toa Loi' 瓊山黎 in this work.



works on Ong-Be were published by F. M. Savina (via Haudricourt 1965) based on a lexicon of the Changliu (長流) variety, and by Hashimoto (1980) based on a lexicon of the Xinying (新盈) variety. In addition, Hansell (1988), based on F. Li (1977), Savina (1965), Hashimoto (1980, 1985), and Zhang et al. (1985), provided a detailed comparison between today's Ong-Be varieties and Proto-Tai.

Zhang et al. (1985) and Liang & Zhang (1997) are both sketch grammars of Ong-Be varieties. Zhang et al. (1985) covered three Ong-Be varieties, i.e., Dongying (東英) of Lingao (臨高) County, Laocheng (老城) of Chengmai (澄邁) County, and Longqiao (龍橋) of Qiongsan (瓊山) County.<sup>19</sup> On the other hand, Liang & Zhang (1997) focused on Lincheng (臨城) of Lingao (臨高) and Longtang (龍塘) of Qiongsan (瓊山). Bailian (白蓮) of Chengmai (澄邁) is mentioned only when it differs from Lincheng. Liu Jiansan (劉劍三), a native of Lingao County, published an Ong-Be-Chinese dictionary based on his Bolian (波蓮) variety in 2000 and a book of collected Ong-Be texts in 2009. Xin (2008) provided another phonological description of the Changliu variety, and Xin (2011) is a piece on the Shishan (石山) variety, both spoken in the suburban regions of Haikou (海口). Below I examine some of these publications in more detail.

- Savina (1965)

Xin (2008) was the first to determine which Ong-Be variety Savina investigated, given that only Changliu, from which this language branch got its name in the materials published outside China, uses /ʔaŋ<sup>3</sup> be<sup>3</sup>/ 'village people' as their autonym, in contrast

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<sup>19</sup> Since 2003 Qiongsan County has become a district of Haikou, the capital of Hainan.

with /ʔaŋ<sup>3</sup> vɔ<sup>3</sup>/ in other Ong-Be varieties. Savina's description employed the Vietnamese alphabet to transcribe Changliu, while the explanations were given in French. This work was edited and published by Haudricourt in 1965, where each lexeme was glossed in French and Thai scripts and Chinese characters were supplemented when necessary for comparison. The major difference between Savina's phonological analysis and mine lies in rhymes.

Given Vietnamese phonology, Savina's Bê system is interpreted in Table 4 and Table 5. Haudricourt pointed out that Savina's tone notations reflected that he did not have a good way to deal with tone sandhi in Changliu.<sup>20</sup> It is noteworthy that Savina distinguished off-glides -w and -j from vowels,<sup>21</sup> and in his system, the glottal stop coda is regarded as part of the suprasegmental features, not a segment, cf. 'ant' in Table 6. Savina's work is extraordinary, considering that it was done in the 1920s.

**Table 4: Savina's Bê onset inventory**

	bilabial	alveolar	palatal	velar	glottal
<b>stops</b>	p' b	t d		k, k'	
<b>nasals</b>	m	n		ng	
<b>affricates</b>		ts			
<b>fricatives</b>		s z			h
<b>laterals</b>		l			
<b>approximants</b>	w		y		

**Table 5: Savina's Bê vowels**

	front	central	back
<b>high</b>	i	ʊ	u
<b>mid</b>	ê	ɔ	ô
<b>low</b>	e	a, â <sup>22</sup>	o

front	back
ia	ua

<sup>20</sup> The original texts are '[...] souvent le même mot, ou la même expression est noté avec des tons différents, [...]' which I translated as 'often, the same word, or the same expression was written with different tones.'

<sup>21</sup> I thank Alexis Michaud for pointing this out to me, and for reminding me of the importance of distinguishing glides from vowels in my phonological analysis.

<sup>22</sup> This vowel only occurs in closed syllables in Savina's Bê system.

**Table 6: Savina's Bê tones**

<b>Examples</b>	<b>Savina's notations</b>	<b>My notations</b>	<b>Tone category<sup>23</sup></b>
'fish'	<i>bá</i>	/ba <sup>35</sup> /	A1
'fire'	<i>běi</i>	/bɛi <sup>24</sup> /	A2
'face'	<i>na</i>	/na <sup>33</sup> /	BC1
'tile'	<i>ngòa</i>	/ŋua <sup>21</sup> /	BC2
'one'	<i>õt</i>	/ʔɔt <sup>55</sup> /	D1
'ant'	<i>mọ</i>	/muʔ <sup>21</sup> /	D2

- Hashimoto (1980)

Hashimoto (1980) represents a well-documented, high-quality portrait of an Ong-Be lexicon. In this work, he presented a phonological system consisting of 16 consonants, six vowels and six tones in the form of (C)(M)V(E)<sup>T</sup> (1980: vi-viii), which was based on a native speaker living in Hong Kong. Here C stands for consonant, M for medial, V for vowel, E for ending/coda, and T for tone. Segments in parentheses are optional. The consonant system can be interpreted as follows: five stops (including two implosives), three affricates, four fricatives, three nasals and one lateral as shown in Table 7. Among these consonants, Hashimoto particularly pointed out that bilabial and velar affricates tend to be pronounced as fricatives, realized as [f] and [x].

<sup>23</sup> See §2.5.4 for an explanation of the notions of the Kra-Dai tone categories.

**Table 7: Initials in Hashimoto (1980:vi)**

		bilabial	labio-dental	dental <sup>24</sup>	alveolar	palato-alveolar	velar	glottal
<b>implosives</b>		b			d			
<b>stop</b>				t			k	(?)
<b>affricate</b>		pf/pç <sup>25</sup>				tʃ	kx/kç	
<b>fricative</b>	<b>voiceless</b>			s/ʃ				h <sup>26</sup>
	<b>voiced</b>		v			ʒ		
<b>nasal</b>		m			n		ŋ	
<b>lateral</b>					l			

As for vowels, there are two high vowels, three mid vowels and one low vowel (see Table 8). He noted that /i/ and /u/ are lower than the quality which the standard IPA symbols represent, and /e/ and /o/ are both in-between standard close-mid and open-mid vowels.

**Table 8: Vowels in Hashimoto (1980)**

	front	central	back
<b>high</b>	i		u
<b>mid</b>	e	ə	o
<b>low</b>		a	

Phonemic tones in this variety are summarized in Table 9. The first four tones are smooth/non-checked tones, and the last two tones are checked tones.<sup>27</sup> In closed syllables, Hashimoto regarded those with checked tones “as tonal variants of” those with smooth tones, because the tone categories are predictable via codas (1980: viii). For instance, Tone (v) is a variant of Tone (ii) when it comes to closed syllables, since these two tones have the same pitch value. This actually matches the convention of

<sup>24</sup> Hashimoto distinguished dental from alveolar in his chart, although these two places of articulation are not phonemically contrastive in Ong-Be languages and varieties.

<sup>25</sup> The phoneme /pf/, which has two allophones [pf] and [pç], is better categorized as a “labiodental”, and /pf/ is palatalized to [pç] only before a high front vowel.

<sup>26</sup> Hashimoto (1980: vi-vii) provided a phonological notation system in addition to an IPA system. The voiceless glottal fricative /h/ is missing in his IPA chart, but present in the notation chart. Because the table here is based on his IPA chart, I italicize /h/ to mark the inconsistency in his two systems.

<sup>27</sup> Checked tones occur in the syllable type that contains a stop coda, while non-checked tones are found in syllables that have zero codas or end in a sonorant.

tonal descriptions in Thai and Vietnamese in which checked tones are considered a syllable type, not a tone category.

**Table 9: Tones in Hashimoto (1980:vii-ix)**

<b>Tone Category</b>	<b>Tones</b>	<b>Pattern</b>
A1	Tone i	low rising (glottal constriction <sup>28</sup> )
A2	Tone ii	high-level
BC1	Tone iii	mid-level
BC2	Tone iv	low-falling
D2	Tone v (checked tone)	high-level
D1	Tone vi (checked tone)	mid-level

Although Hashimoto did not specify which Ong-Be variety his consultant spoke, based on my fieldwork data, the variety he investigated is most likely Xinying (新盈). Since this phonological system has /v/, it rules out the possibility of it being the Changliu (長流) variety. The six-vowel system indicates that this is more likely to be an Ong-Be variety spoken in Lingao County (臨高縣) where the number of vowels is around seven. Zhang et al. (1985:18), Liang & Zhang (1997:32) and Liu (2000:7) all state that while other varieties in Lingao distinguish /o/ and /ɔ/, Xinying has only one mid back vowel, resulting in a five-vowel system, like the one under discussion.<sup>29</sup> In addition, the variety Hashimoto portrayed lacks /ŋ/, which matches the characteristics of Xinying because /ŋ/ in Xinying has been denasalized and merged with /ʒ/. Xinying, together with Diaolou (調樓), also keeps aspirated stops which Hashimoto interpreted as affricates. All these traits show that Hashimoto's consultant, Lim Bek, must be originally from Xinying.

<sup>28</sup> Hashimoto described Tone (i) as having 'very conspicuous laryngeal constriction toward the end of syllable' (1980:viii), the characteristic of which I refer to as glottal constriction. Following the definition given in A. Michaud (2004:120), I regard glottal constriction as 'a tense gesture of adduction of the vocal folds that extends over the whole of a syllable rhyme'.

<sup>29</sup> Liang & Zhang (1997:32) said that Xinying has only /o/ while Zhang et al. (1985:18) and Liu (2000:7) stated that only /ɔ/ is attested in Xinying. Despite these statements, my Xinying consultant shows the /o/-/ɔ/ distinction.

- Solnit (1982)

Solnit (1982) attributed the similarity with respect to the initial systems in Haikou Hainanese, Ong-Be (the variety described in Hashimoto 1980) and Vietnamese to the past intensive language contact in southern China, possibly taking place during 600-950 A.D. Four shared features were specified. They are (1) the existence of voiced implosives /b/ and /d/, (2) the missing /t<sup>h</sup>/ and the development of  $p^h \rightarrow (p)f$  and  $k^h \rightarrow (k)x$ , (3) the missing /p/, and (4) only one apical affricate.

Solnit mentioned that /t/ in today's Ong-Be is likely to originate from palatalization of Proto-Kam-Tai velars as suggested by a comparison with Kam-Sui and Tai data, while the early Ong-Be voiceless dental/alveolar stop has become an implosive. He further pointed out that in Ong-Be and Vietnamese aspirates only occur in Sinitic loans, not the native strata. That is, aspiration is not reconstructible to the proto level. And in Hainanese, several affricates and fricatives became corresponding stops (lost their frication), while the early Min voiceless aspirated alveolar stop has been softened to /h/. As for the missing /p/, it had already merged with its voiced counterpart, which later became the bilabial implosive in these three languages.

Solnit also proposed that the implosivisation could have resulted from contact with Hlai or an unknown language of the region, or was innovated in one of the three languages under discussion and later spread to the other two through intensive contact. However, as pointed out in Xin (2006), Solnit wrongly classified Hainanese as descended from Southwestern Chinese.

- Zhang et al. (1985) and Liang & Zhang (1997)

Zhang et al. (1985) is the first grammar sketch on Ong-Be published in China, where the authors investigated three Ong-Be varieties, i.e. Dongying (東英), Laocheng (老城) and Longqiao (龍橋). Thousands of lexical items are given. This book also introduces the history, distinctive cultures and the possible ethnic formations of speakers of Ong-Be. Ong-Be vocabulary was compared with that in Tai, Kam and Hlai to show that these languages are genetically related. Zhang et al. (1985:122) mentioned that Ong-Be is particularly closely related to Tai, based on the data from Zhuang (壯) and Dai (傣). This sketch serves as the first attempt to divide Ong-Be into different groups/subdivisions.

Liang & Zhang (1997), which focused on Lincheng (臨城) and Longtang (龍塘), is an impressive work, in which Ong-Be is explored in both synchronic and diachronic perspectives. In addition to the phonological descriptions of two Ong-Be varieties, Lincheng and Longtang, the phonology of today's Ong-Be was scrutinized via a comparison with its sister languages and with the Proto-Kra-Dai onsets<sup>30</sup> reconstructed by Liang & Zhang. Liang & Zhang (1997:185) suggested that the forebears of Ong-Be left the mainland before the split of Kra-Dai proto Tones B and C, cf. Zhang et al. (1985) where they regarded it as merger. However, I argue that it is more reasonable to consider this linguistic characteristic a merger, because Ong-Be is one of only three Kra-Dai languages that do not distinguish Tones B and C, whereas such as distinction

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<sup>30</sup> The Proto-Kra-Dai system cited in Liang & Zhang (1997) is likely to be based on Liang & Zhang (1996), the reconstruction of which did not include data from the Kra subgroup and included little data from the Hlai subgroup.

is attested in a majority of Kra-Dai languages.<sup>31</sup> This book is the first to attribute the tonal splits in Longtang (龍塘) to a vowel length distinction by comparing Longtang data with Zhuang data which shows that /e/ generally maps to short vowels in Zhuang whereas Longtang /a/ corresponds to both long and short /a/ in Zhuang. I propose an alternative which emphasizes on the vowel length at the time of the split, which might not be reconstructible to Proto-Ong-Be (see §4.1).

Dongying (東英) in Zhang et al., and Lincheng (臨城) in Liang & Zhang have the same phonology as that of Bolian (波蓮) which will be introduced in a later section. Longqiao (龍橋) shows an identical phonology to that of Longtang (老城) which will be discussed in Chapter 3. The phoneme inventory and tonal system of Laocheng is presented in Table 10 - Table 12. We see that in Zhang et al.'s analysis, Laocheng phonology consists of 16 consonants, seven vowels and six plus one tones where Tone 5 only occurs in loanwords.

**Table 10: The onset inventory of Laocheng in Zhang et al. (1985)**

	<b>bilabial</b>	<b>labiodental</b>	<b>alveolar</b>	<b>velar</b>	<b>glottal</b>
<b>stops</b>	<sup>?</sup> b		t <sup>?</sup> d	k	ʔ
<b>nasals</b>	m		n	ŋ	
<b>affricates</b>			ts		
<b>fricatives</b>		f        v	s        z	x	h
<b>laterals</b>			l		

**Table 11: The vowel inventory of Laocheng in Zhang et al. (1985)**

	<b>front</b>	<b>central</b>	<b>back</b>
<b>high</b>	i		u
<b>mid</b>	ɛ	ə	o ɔ
<b>low</b>	a		

<sup>31</sup> Ostapirat (1998) mentioned that the merger of Tones B and C is also reported in Qinglong 青龍 of the Kra branch in Guizhou, China, and Khorat of Southwestern Tai in Thailand.



**Table 12: Tones of Laocheng in Zhang et al. (1985)**

<b>Tone Category</b>	<b>Pitch Height</b>
1 (= A1)	35
2 (= A2)	33
3 (= BC1)	13
4 (= BC2)	21
5	55
7 (= D1)	55
8 (= D2)	21

Like most of the analyses done in China, Zhang et al. (1985) and Liang & Zhang (1997) do not distinguish off-glides from vowels. Hence the *-w* and *-j* in my phonological descriptions are not utilized in their systems, and each variety contains more than 10 diphthongs in their phonological sketches. However, Zhang et al. (1985) and Liang & Zhang (1997) considered what I analyze as diphthongs, *-ia* and *-ua*, as being composed of an on-glide, either *-i-* or *-u-*, followed by a vowel, resulting in *-io*, *-iau*, *-ua*, etc. The status of these vocalic elements will be discussed in Chapter 6.

- Liu (2000)

Liu (2000) is the most exhaustive work on the lexicon of Ong-Be spoken in Lingao County. This dictionary is based on, but not confined to, the Bolian (波蓮) variety of which Liu is a native speaker. The phoneme inventories are given in Table 13 and Table 14. Liu (2000) contains thousands of lexemes together with their meanings, usage, and source of origins if it is a loanword. It also provides extensive documentation of place names in Lingao County and their etymologies. Due to the homogeneity of Lingao varieties, Liu (2000) serves as an important guide for scholars working on Ong-Be spoken in Lingao County.

Liu did not distinguish glides from vowels either. Certain vowels in his notations, such as *-u* in *-iu* and *-i* in *-ai*, are analyzed as glides in my system, considering that they never

co-occur with another consonant coda. Tones of Bolian are given in Table 15. Tones 1 - 4 correspond to Tones (i) - (iv) in Hashimoto, while Tones 7 and 8 correspond to Hashimoto's Tones (vi) and (v) respectively. Tone 9 is observed in onomatopoeia.

**Table 13: The onset inventory of Bolian in Liu (2000)**

	bilabial	labiodental	alveolar	(alveolo)palatal	velar	glottal
<b>stops</b>	b		t d		k	ʔ
<b>nasals</b>	m		n	ɲ <sup>32</sup>	ŋ	
<b>affricates</b>			ts			
<b>fricatives</b>		f v	s	j <sup>32</sup>	x	h
<b>laterals</b>			l			

**Table 14: The vowel inventory of Bolian in Liu (2000)**

	front	central	back
<b>high</b>	i		u
<b>mid</b>	e <sup>33</sup>	ə	o ɔ
<b>low</b>	a		

**Table 15: Tones of Bolian in Liu (2000)**

Tone Category	Pitch Height
1 (= A1)	13
2 (= A2)	55
3 (= BC1)	33
4 (= BC2)	21
7 (= D1)	33
8 (= D2)	55
9	21

- Xin (2006, 2007, 2008, 2011)

Xin has published a series of work since the mid-2000s, which have significantly contributed to the study of Ong-Be. Xin (2006) examined the Ong-Be initials via a comparison with other Kra-Dai languages in a synchronic perspective. He proposed that

<sup>32</sup> The orthography used in this dictionary mostly follows the IPA conventions, although 'j' which is /ʒ/ in IPA, corresponds to 'ɟ' in Hashimoto (1980) and 'ɟ' in Xin (2006, 2007, 2008, 2011). Liang & Zhang (1996) also use 'j' to represent the (alveolo)palatal fricative.

<sup>33</sup> 'e' in Lingao is closer to /ɛ/. Since there is only one front mid vowel, it does not matter if it is written as /e/.

Ong-Be does not belong to Kam-Sui, Tai or Hlai branches, but is particularly close to Southwestern Tai, contrary to the earlier common belief that Ong-Be is closer to Northern Tai which is based on lack of phonemic aspiration on both sides.<sup>34</sup> In this article, Xin used the terms ‘eastern dialect’ and ‘western dialect’ without specifying the criteria and their coverage.

Xin further proposed that regarding the *l* : *z* correspondence, the fricative reflex found in Eastern Ong-Be is innovative. This proposal is different from my reconstruction of \**z*<sup>1</sup>- and \**z*<sup>2</sup>- reflected as *l*<sup>1</sup>- and *l*<sup>2</sup>- in Eastern Ong-Be. He also claimed that fricative occlusion found in Ong-Be, Vietnamese, Mulam, Lakkia, and Then must be caused by a Sinitic language serving as the lingua franca in Guangdong and Guangxi; cf. Solnit (1982) for an explanation of how such an influential language may not necessarily be Sinitic.

Xin (2007) was the first article to introduce the 19<sup>th</sup> century missionary documentations of Ong-Be, with a focus on Carl C. Jeremiassen’s work on *Lim-ko Loi* ‘Lingao Hlai’ which is an Ong-Be variety spoken in today’s Lingao County. Xin mentioned that although early missionaries had already noticed the close ties between Ong-Be, Thai, and Hlai, Savina was the first to determine that Bê and Hlai are two separate languages.

In addition to explaining Jeremiassen’s notations, Xin suggested that the variety under discussion is spoken in central-south Lingao County, via a comparison with his own fieldwork data. He also noted that Jeremiassen (1893), who documented phonemic aspirated stops, *p*<sup>h</sup>- and *k*<sup>h</sup>-, is the earliest known record of Ong-Be spoken in Lingao. Considering that none of today’s Ong-Be varieties spoken in central-south Lingao kept

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<sup>34</sup> Also cf. Hashimoto (1980:v) where Ong-Be is said to be particularly close to F. Li (1977)’s Central Tai.

the phonemic aspiration, Xin stated that Jeremiassen's work is a valuable piece in providing solid clues on the directionality of sound change taking place over the past century.

Xin (2008) represents the informative phonological sketch of Ong-Be spoken in Changliu, since the publication of Savina (1965). Both the Kra-Dai stratum and Sinitic stratum were investigated and described with impressive accuracy. In this work, Xin presented ten monophthongs, 15 initials and seven tones for the Kra-Dai stratum. Nevertheless, as with all Chinese publications mentioned above, he did not distinguish off-glides from vowel codas. He subsequently came up with 16 diphthongs (cf. only two in my analysis). By contrast, what I treat as a diphthong is analyzed as an on-glide followed by a vowel. The phonological portrait of Changliu will be given in Chapter 3.

Xin (2011) describes the phonology of the Shishan variety within the framework of modern linguistics, in contrast to that of E. H. Parker (1892). The phonological system of Shishan is composed of 16 initials,<sup>35</sup> seven monophthongs, and eight tones (see Table 16 - Table 18), in addition to the numerous diphthongs.

**Table 16: The onset inventory of Shishan in Xin (2011)**

	<b>bilabial</b>	<b>labiodental</b>	<b>alveolar</b>	<b>palatal</b>	<b>velar</b>	<b>glottal</b>
<b>stops</b>	p <sup>h</sup> ʔb		t       ʔd		k, k <sup>h</sup>	ʔ
<b>nasals</b>	m		n		ŋ	
<b>affricates</b>			ts <sup>h</sup>			
<b>fricatives</b>		v	s       z			h
<b>laterals</b>			l			

<sup>35</sup> In his system, the on-glides are written as *-i-* and *-u-*, and there are no off-glides.

**Table 17: The vowel inventory of Shishan in Xin (2011)**

	front	central	back
high	i		u
mid	ɛ	ə	o ɔ
low	a		

**Table 18: Tones of Shishan in Xin (2011)**

Tone Category	Pitch Height
1 (= A1)	24
10 (= A2)	33C
3 (= BC1)	33
4 (= BC2)	21
5	55
7 (= D1)	13
7' (=D1)	55
8 (= D2)	21

Xin (2011) is the first to show that the Kra-Dai smooth Tone A2 in Shishan is now a checked tone, which Xin marks as Tone 10. That is, the original nasal codas have become homorganic stops ( $-m \rightarrow -p$ ,  $-n \rightarrow -t$ , and  $-\eta \rightarrow -k$ ) and a glottal stop is inserted as a coda to the original open syllables bearing a Tone 2. In non-sandhi position, Tone A2 is pronounced as a checked tone, i.e., 33C, whereas in the sandhi position, Tone A2 is realized as Tone BC1, namely 33.

Based on E. H. Parker (1892), Xin pointed out that such a tonal ‘flip-flop’ must have taken place before the 1890s, via a stage where the nasals and the homorganic stops co-existed,  $-mp$ ,  $-nt$ ,  $-\eta k$ ,<sup>36</sup> besides the glottal stop insertion in the open syllables. He also proposed that since the sandhi form of Tone A2 does not show a ‘flip-flop’, a smooth-checked ‘flip-flop’ must have taken place after tone sandhi came into being.

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<sup>36</sup> This was observed in his consultants’ pronunciations.

## 2.4. Previous studies on Proto-Ong-Be

This section details several studies which discuss Ong-Be from a historical perspective. On the one hand, Hansell (1988) compares Ong-Be to Proto-Tai and Ostapirat (2005b) discusses how Ong-Be developed of Proto-Kra-Dai. Norquest (2007) and Chen (2015), on the other hand, provide a pilot study of the Proto-Ong-Be phonological system.

- Hansell (1988)

Hansell (1988) presented the most systematic comparison between Ong-Be (mostly based on Hashimoto 1980) and Proto-Tai (based on F. Li 1977) regarding initials and tones. He suggested several sound change routes. For example, he proposed that  $p^1$ - in ‘rain’ and ‘foxtail millet’ and  $v^1$ - ‘dream’ in Ong-Be were derived from the same proto initial, where  $p^1$ - only occurs before \*-u-. While this round vowel is still reconstructible in Tai, this labialization environment is not observed in today’s Ong-Be (Hansell 1988:269). Ostapirat (2005b:277-278), on the other hand, suggested that these two onsets in Ong-Be were conditioned by different Proto-Kra-Dai presyllable onsets.

By comparison with the Sui data, Hansell (1988:268-270) noted that  $t^1$ - and  $t^2$ - in Ong-Be are the result of palatalization, which is a shared retention between Ong-Be and Sui (also see Solnit 1982:224 and Ostapirat 2005b:281-283). Nevertheless, neither labialization nor palatalization can be reconstructed to Proto-Ong-Be based solely on the internal evidence.

Hansell (1988:280-285) concluded that considering shared lexical innovations, Ong-Be is more closely related to Tai, than to Kam-Sui or Hlai. No shared phonological innovations are presented between Ong-Be and Tai. He argued that Tai and Ong-Be

were derived from a common ancestor he called ‘Be-Tai’ which is a sister language of Kam-Sui.

- Ostapirat (1998, 2005b)

Ostapirat (1998) is the first to specify and demonstrate that *Jizhao Haihua* 吉兆海話, a language of (south)western Guangdong, contains Ong-Be related elements that are confined to basic vocabulary.<sup>37</sup> Since Hainan is an island, it is most likely that at a certain point of time Ong-Be forebears must have migrated from the nearby mainland, which is most likely to be the Leizhou Peninsula 雷州半島 in southern China.

Ostapirat suggested that it is reasonable to postulate that ‘the Jízhào were rather a Bê group, which has become assimilated to Sinitic, but somehow kept remnants of their former mother tongue in a few basic words’, rather than the other way around where a Chinese group from the Leizhou Peninsula borrowed 17 basic terms from Ong-Be. However, it is open for discussion whether *Jizhao Haihua* speakers were conclusively an Ong-Be group that back migrated from Hainan to the mainland, or were merely descendants of a larger indigenous people of Leizhou who once spoke a language resembling Ong-Be, but have been leveled out by the Sinitic-speaking populations. There is no evidence indicating that the nature of the contact the *Jizhao* and the Ong-Be had either.

Ostapirat (2005b) examined the Ong-Be obstruents in a Kra-Dai perspective, and showed how residue of Proto-Kra-Dai obstruents are reflected in today’s Ong-Be. He concluded that ‘early Kd obstruent initial and medial consonants have shuffled into a

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<sup>37</sup> J. Li and Wu (2017) provide the status quo of *Jizhao Haihua*, in which they classify *Jizhao Haihua* as a Kra-Dai language most closely related to Ong-Be and Zhuang (Tai). The relation between Ong-Be and *Jizhao* will be discussed in future study.

Proto-Be system that chiefly contrasts voiceless and voiced initials. These initials were in more recent history devoiced, implosivized, and had given up their voicing contrast for tonal distinction.’ (p. 289–290). A detailed discussion of the difference between Ostapirat (2005b) and the reconstruction proposed in this study will be presented in Chapter 5 (see §5.3.1). The major difference lies in the reconstruction of an early voicing contrast.

- Norquest (2007)

Norquest (2007:249-306) also provided many reconstructed lexical items for Proto-Ong-Be, although he did not specify the phonology of Proto-Ong-Be. Based on his reconstructed vocabulary, his Proto-Ong-Be inventory is interpreted in Table 19 - Table 20. Note that given the limited amount of the data available, the inventories shown below do not intend to fully represent his system.

**Table 19: Norquest’s Proto-Ong-Be consonant inventory**

	<b>bilabial</b>	<b>labio-dental</b>	<b>alveolar</b>	<b>(alveolo) palatal</b>	<b>velar</b>	<b>glottal</b>
stops	*p *b		*t *d	*c	*k *g	*ʔ
nasals	*m		*n	*ɲ	*ŋ	
fricatives		*f *v	*s *z	*ɕ *ʑ	*x *ɣ	*h *ɦ
trills			*r			
laterals			*l			
approximants	*w			*j		

Norquest reconstructed a voicing contrast, and stated that voiceless sonorants resulted from consonant clusters the first segment of which was voiceless. No affricates were found, although labiodental and velar fricatives were observed. In his system, \*c occurs only in the coda position, and \*j never occurs in the onset. Norquest’s syllable canon for Proto-Ong-Be is C(M)V(C) in which the medial can be either \*-w- or \*-j-. Because Norquest did not provide an explanation of his notation regarding Proto-Ong-Be, it



remains unclear if his *pj-*, *lj-*, *fw-*, *ɛw-* should be treated as complex onsets composed of a consonant followed by a glide, or a single palatalized or labialized segment. As for vowels, 14 monophthongs and four diphthongs are found. A distinction between CMVC and CVVC is observed, cf. \*piaŋ<sup>x</sup> ‘put down; let go’ versus \*kjaŋ ‘ginger’, \*liəŋ ‘neck’ versus \*C-jəw<sup>x</sup> ‘stay, be at; alive’. In addition, glides are allowed to co-occur with a homogenous vowel, as illustrated by \*wuən ‘fur’ and \*C-jia: ‘medicine’. Such a sequence is not found in my reconstruction.

**Table 20: Norquest’s Proto-Ong-Be monophthongs and diphthongs**

	front	central	back		
high	*i, *i:	*ɯ, *ɯ;	*u, *u:	front	back
mid	*e:	*ə, *ə:	*o, *o:	*ia, *ie	*ua, *ue
low	*a, *a:	*ɐ			

Norquest’s consonant inventory is symmetrical. Nevertheless, here comes the question whether his reconstruction should be considered Proto-Ong-Be or Pre-Proto-Ong-Be for the reconstructed sesquisyllables. Since a monosyllabic model is sufficient in explaining sound correspondences and changes in Ong-Be discussed in this dissertation, whether a sesquisyllabic model is needed is open for discussion. He also reconstructed medial glides. When phonotactics is taken into consideration, the possible medials *-w-* and *-j-* in CMVC can be better explained when regarded as part of diphthongs. Because a voicing contrast on initials has been completely lost in the contemporary Ong-Be varieties, such a contrast is not reconstructible based on internal evidence.

\*-oC and \*-əC are reconstructed separately in his system, part of which I regard as a single rhyme group that can be derived using phonological rules. With respect to the coda, the reconstruction of Proto-Ong-Be \*-c cannot be reached without referring to external evidence, since none of today’s Ong-Be varieties employ *-c* as a coda. The

reconstruction of Proto-Tai \*-c, which is a shared retention of Proto-Kra-Dai \*-c, is grounded in a recurrent *-k:-t* correspondence between Saek and the rest of the Tai languages (Pittayaporn 2009:211-213; Ostapirat 2009). However, regular discrepancies on coda are not attested in the Ong-Be languages to serve as grounds for reconstructing \*-c because today's Ong-Be varieties regularly reflect Proto-Kra-Dai \*-c as a glottal stop.

- Chen (2015)

Based on Liang & Zhang (1997) and Xin (2008, 2011), Chen (2015) proposed a reconstruction for Proto-Ong-Be consonants with a voicing contrast, instead of a tonal series (see Table 21). Chen argued that no consonant clusters or sesquisyllabic onsets can be reconstructed, and that phonemic aspiration did not exist in Proto-Ong-Be. While all consonants are allowed to occur in the onset, only \*-m, \*-n, \*-ŋ, \*-p, \*-t, \*-k and \*-ʔ can serve as Proto-Ong-Be codas. \*-j was not included in Chen's system. Chen, following Ostapirat (2005b), suggested that fortition and spirantization are the major sound change mechanisms that took place from Proto-Ong-Be to contemporary Ong-Be. The main differences between Chen (2015) and this dissertation are that using the comparative method strictly a voicing contrast cannot be reconstructed, and that this dissertation does not reconstruct preglottalized stops,<sup>38</sup> palatal stops and the uvular trill found in Chen (2015).

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<sup>38</sup> In Kra-Dai studies, the term 'preglottalized' was first used in F. Li (1943) to describe a series of consonants in Proto-Tai. Today a phonologically preglottalized segment can be interpreted either as a voiced implosive or a glottal stop followed by a voiced consonant (ʔC-), which some people might consider a single segment (ʔC-). This series of sounds is voiced at the segmental level today, but its tonal development aligns with voiceless initials in other branches of the broader Kra-Dai family.

**Table 21: Chen (2015)'s Proto-Ong-Be consonants**

	bilabial	alveolar	palatal	velar	uvular	glottal
<b>preglottalized</b>	*ʔb	*ʔd	*ʔʑ			
<b>stops</b>	*p *b	*t *d	*c *ɟ	*k *g		*ʔ
<b>nasals</b>	* <sup>h</sup> m *m	* <sup>h</sup> n *n	* <sup>h</sup> ɲ *ɲ	* <sup>h</sup> ŋ *ŋ		
<b>affricates</b>		(*ts) *dz				
<b>fricatives</b>		*s *z				*h
<b>laterals</b>		* <sup>h</sup> l *l				
<b>trills</b>					*R	
<b>glides</b>	* <sup>h</sup> w *w					

## 2.5. An introduction to tonal developments in (South)East Asia

There exists a wide body of literature about how tone develops. The development of incipient tones can be conditioned by initials or finals. This section first presents pathways for the developments of tones with data drawn from Austroasiatic, Kra-Dai, Sino-Tibetan, and Austronesian languages, followed by an examination of the phonetic plausibility of the above-mentioned routes. The second half of this section introduces tone marks used in the studies of Vietnamese (ngang, huyền, sắc, hỏi, ngã, and nặng), Sinitic (Pīng, Shǎng, Qù, and Rù), and Kra-Dai ('basic', 'primary', 'secondary', and numerals 1~10) as well as their mappings concerning tone categories (A, B, C, and D).

The development of tones accompanied by syllable erosion is one of the most well-known linguistic traits in (South)East Asia, known from Sino-Tibetan, Kra-Dai, Austroasiatic (Mon-Khmer), Hmong-Mien, and Austronesian (Cham).<sup>39</sup> The term "tonogenesis" was coined by Matisoff in 1970 and elaborated in 1973, although Haudricourt (1954a) was the first to propose the idea of tonogenesis where he explained the origin of Vietnamese tones through a comparison of Vietnamese with its

<sup>39</sup> Note that, however, reduction of syllables might not necessarily lead to the development of tones.

toneless Mon-Khmer sister languages.<sup>40</sup> Matisoff (1973:77) suggested that monosyllabicity (each morpheme equals one syllable) is the key to the development of a fully tonal language. A. Michaud (2012) identified three types of syllable erosion – (1) the complete loss of the presyllables, (2) the spirantization of medial consonants before losing the presyllables, and (3) the rise of consonant clusters after the reduction of the presyllables. While tonogenesis is often used as a cover term, there are primarily two routes for development of phonemic pitch contrasts – one from initials and the other from finals.

A summary of the aforementioned two routes for the development of tones is presented in Table 22.

**Table 22: Two routes for the development of tones**

<b>Phonemics</b>	<b>Origin</b>	<b>Initial Pitch Contrast</b>	<b>Secondary Split</b>
pitch	finals	level, rising, falling, and 'checked tone'	early initials
pitch; voice quality/ phonation	initials	high, low	early finals

The development of tones, shown in Haudricourt (1954a, 1954b), was initiated by loss of the finals. The development of phonation contrasts could also be triggered by the voicing contrast in the initials (Haudricourt 1961; Thurgood 1993, 1999, 2002). Further splits of tones are conditioned by laryngeal features (voicing, aspiration, preglottalization, etc.) of the initials at the time the phonetic splits took place. Register languages can evolve into tonal languages conditioned by the finals at the time the phonetic splits took place. Note that in (South)East Asian linguistics, initials refer to the first segment of a

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<sup>40</sup> H. Maspero (1921) marks the first attempt to explain the correlation between initial consonants and tones in Vietnamese.

complex onset while finals (namely appendixes)<sup>41</sup> refer to the last segment of a complex ‘coda’.<sup>42</sup> In languages where complex onsets and codas are not allowed, initials and finals are the same as single-consonant simplex onsets and codas.

It is important to distinguish three basic terms when referring to tone - (1) tone category, (2) tone value, and (3) tone shape/pitch curve. Tone category refers to the earliest phonemic tones in the history of a language. Vietnamese can be used to illustrate. Since there were three tones when tones first became phonemic, these three are regarded as three proto tone categories, regardless of the number of phonemic tones at a later stage in Vietnamese. As for tone value, this is associated with the phonetic pitch height/value, as illustrated by the well-known Modern Mandarin four tones 55 (mā 媽), 24 (má 麻), 213 (mǎ 馬), and 51 (mà 罵), rendered in Chao’s system where 5 represents the highest pitch and 1 the lowest pitch. Tone shape relates to the notions of level, rising, falling, falling-rising, etc. A level tone can be realized in several ways, such as high-level 55, mid-level 33, and low-level 11. These three tones, although having different tone values, are all level tones. The same tone category might have different tone values in two genetically related dialects or languages. For example, the tone values for ‘horse’ 馬 in Mandarin Chinese is *ma*<sup>213</sup> (with a falling-rising tone shape), but

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<sup>41</sup> Baxter (1992) referred to ‘final’ as ‘post-coda’, which is termed ‘appendix’ in theoretical phonology. The so-called ‘post-coda’ in Old Chinese could be (1) part of the roots, as exemplified by transcriptions of early loans ending in -s and by certain cognates between Chinese and Tibetan where Tibetan maintains -s, or (2) a derivational suffix, based on the Qùshēng and Rùshēng alternation within Chinese (Baxter *ibid*: 313-317).

<sup>42</sup> In phonology, an appendix, which at the surface level seems to be part of the coda, is actually not regarded as part of the coda of the syllable, because appendices do not behave like a coda (for example, they do not occupy weight while the coda does) or are not subject to the normal phonological processes expected on the syllable codas (such as in violation of the sonority hierarchy). Affixation also induces appendix-like behaviors. (see Chapter 3 in Ewen and van der Hulst 2001 and Chapter 6 in Goldsmith 2011, among others).

in Taiwanese Southern Min it is *bɛ*<sup>42</sup> (with a falling tone shape). Also, it is not uncommon that tone values in a single language keep changing without changing tone categories, as exemplified by contemporary Bangkok Thai (Teeranon 2007; Thepboriruk 2015).<sup>43</sup>

Thurgood (1993, 1999, 2002) proposed a revised tonogenesis model which assumes that the voice quality/phonation, instead of segments, plays a decisive role in the development of contrastive pitches. The laryngeal features of proto voiced stop initials led to breathy voice on the following vowels, which in turn is associated with a lower pitch. By contrast, vowels with a clear voice and a higher pitch are correlated with proto voiceless stop initials. Denning (1989) also pointed out that in world's languages where voice quality is phonemic, "voice quality distinctions are widely accompanied by pitch distinctions. More specifically, breathy voice is associated with lower pitch and the lowering of the larynx, while the tense voice is associated with higher pitch and the raising of the larynx" (p.60).

Although tone and register are closely correlated and co-occur, these two properties are not identical. For example, Hyslop (2008:832, footnote 6) mentioned that Kurtöp, a Tibeto-Burman language in Bhutan, has no audibly breathy-clear phonation distinction while undergoing tonogenesis. Abramson et al. (2015:252-254) also showed that while phonation differences (clear and breathy) are consistent across speakers in the Mon dialect with a register system they investigated, pitch curves associated with the register distinction are "idiosyncratic by speaker". However, Brunelle and Kirby (2016)

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<sup>43</sup> This can be compared to a semantic shift of a word that does not affect its etymology.

suggested that in southeast Asian languages it is better to treat tone and phonation “as different manifestations of a single contrastive property” (p. 195).

Note that cases of phonation contrasts in tonal languages and pitch contrasts in register languages are attested. For instance, Dai Tho, a fully tonal Tai language of Yunnan (China), has a creaky voice, breathy voice, and modal voice in addition to tones (L-Thongkum 1997). Western Khmu (Mon-Khmer, Austroasiatic), by contrast, is an instance of a register language with perceivable pitch differences in addition to two phonation types (Suwilai 2001).<sup>44</sup> In addition, Mazaudon & A. Michaud (2008) presented a case study on Tamang (Bodic, Tibeto-Burman) where after the neutralization of the initial voicing, four phonemic tones evolved in this register language (high-low tones + breathy-modal voices). Brunelle and Kirby (2016) also addressed the difficulty in classifying languages like Black Miao, Northern Vietnamese, and Burmese as a tone language or a register language since both tone and phonation type are phonemic. In general, there are three major phonation types in (South)East Asia, i.e., clear/modal, breathy, and creaky (see Table 23). Having either two out of the three is sufficient for the development of different phonations associated with different pitch heights.

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<sup>44</sup> Suwilai (2001:52) noted that “They always criticize my Khmu as being too clearly voiced when I use mainly the low/high pitch contrast.” which clearly shows that the phonation type is the most salient cue in the mind of Khmu native speakers.

**Table 23: Register complexes (Thurgood 2002:346-7)**

	Tense Register	Unmarked	Breathy Register
original initials:	proto-voiceless		proto-voiced
voice quality:	tense (creaky)	modal (clear)	breathy
vowel quality:	lower (open); more fronted vowels; tendency to diphthongization; often shorter		higher (closed); more backed vowels; tendency to to centralization; often longer
pitch distinctions:	higher pitch; associated with -ʔ		lower pitch; association with -h
state of larynx:	larynx tense and/or raised (= reduced supraglottal cavity)		larynx lax and/or lowered (= increased supraglottal cavity)

Henderson (1967:171) observed that pitch, intensity, duration, voice quality, glottal closure, etc. are all encoded in languages with contrastive pitch heights. Following Henderson, Thurgood (2002:346) stated that “In a tone system, the speakers have come to treat pitch characteristics as salient; in a register system, it is the voice quality differences.” In other words, segmental and suprasegmental features, such as pitch, voice quality, voicing, etc., co-exist in atonal languages.<sup>45</sup> And children pay attention to the most salient one in their minds, which changes from time to time, while acquiring the languages, resulting in the development of phonemic tones or registers. For example, at the early stage, phonetic pitch heights were merely concomitant co-articulation of segments. At later stages, the conditioning environments, such as contrastive voicing or voice quality, were lost, leaving their co-articulated pitch heights unchanged. Consequently, phonemic tones or registers resulted because these suprasegmental features were no longer predictable. Moreover, the contrastive voice quality also causes

<sup>45</sup> Here is a supplement to how speakers of different L1s choose the dominant cue in perception - as a native speaker of two tonal languages, I use pitch height as the major perceptual cue in judging the primary stress in English which is atonal.



vowel qualities to restructure where creaky voice can lead to diphthongization and breathy voice to vowel centralization, as exemplified in Haroi, a Chamic language of Vietnam (Thurgood 1999:197-206).

### **2.5.1. Phonetic plausibility**

The claim that voiceless initials lead to a high tone and voiced initials lead to a low tone has its phonetic grounds. House & Fairbanks (1953), Lehiste & Peterson (1961), Mohr (1968), Gandour (1974), Löfqvist (1975), Hombert (1975a), among others, all demonstrated that vowels following voiceless stops, compared to voiced stops, have a higher  $F_0$  in non-tonal languages. As for tonal languages, Hombert et al. (1979:41) also supported the claim. Their research results demonstrated that the perturbation on  $F_0$  caused by the voicing of the initials is perceptible. Haggard, Ambler & Callow (1970), Massaro & Cohen (1976), Abramson & Erickson (1992), and Whalen et al. (1993) all proposed that English speakers associate voicing with a low pitch (when the initial  $F_0$  decreases), and voicelessness with a high pitch (when the initial  $F_0$  increases), as a perceptual cue.

Other consonant types also change the  $F_0$  of the following vowels. With respect to (voiced) implosives, Erickson (1975), Demolin (1995), Odden (2005), Ruff (2005), among others, noted that implosives, like voiceless stops, raise the  $F_0$ . On the other hand, Painter (1978) found no correlation between a higher  $F_0$  and implosives in Sindhi, while Frazier (2008) held that implosives, like sonorants, lower the  $F_0$  in Yucatec Maya. Hombert et al. (1979) mentioned that “there was little difference in the onset  $F_0$  following [b] and [ɓ] as spoken by an English-speaking phonetician. Tang (2008:58) thus concluded that “[A]n implosive, unlike an ejective, has the potential for  $F_0$  lowering and

raising even in its canonical form, since it involves both voicing and larynx lowering.”

That is, implosives could be  $F_0$  raisers or lowerers as well. As for the glottal stop, Hombert (1978) showed that a glottal stop raises the  $F_0$  of the preceding vowels in Arabic. Frazier (2008), by contrast, argued that a glottalized consonant lowers the  $F_0$  of the preceding vowels.

Regarding the influence of codas on the preceding vowels, some studies, such as Slis (1966) and Mohr (1968), suggested that the voicing of postvocalic consonants has the same influence on vowels as their prevocalic counterparts, while other studies, such as Lea (1972, 1973), Hanson (1975) and Jeel (1975), showed that postvocalic consonants in general lower  $F_0$ . Based on Arabic data, Hombert (1975b, 1978:92-94) and Hombert et al. (1979:51) both indicated that the  $F_0$  of the vowels goes down (25-50 Hertz) when followed by [h] but goes up when followed by a glottal stop (9-48 Hertz). This  $F_0$  difference becomes distinctively significant at least 70 milliseconds before the cease of the preceding vowels. Gradin (1966) and L-Thongkum (1990), on the other hand, stated that the  $F_0$  of the vowels followed by [h] may either go up or down, depending on the language. Kingston (2005) also mentioned that in Athabaskan languages, a constricted vowel arising from a glottalic consonant following it can lead to the development of either a high tone or a low tone, depending on whether such a constriction was realized as tense voice or creaky voice.

Light (1978) proposed that due to the syllable canon constraint, the loss of a segmental position within a canonical syllable cannot be compensated at the segmental level. For this reason, compensation has to be made at other phonological layers, such as the suprasegmental tier, which leads to the development of phonemic tones. Wallace (1975

& p.c. cited in Light 1978:125) mentioned that because of the reduction of vowels in the unstressed position, such suprasegmental compensations are also attested in Germanic languages, such as English where the stress became dominant, and in Swedish where register tones resulted.

In sum, these phonetic studies provide phonetic plausibility for the development of tones, which consolidate the proposals regarding the tonal development and splits assumed by talented historical linguistics and philologists at earlier times. However, counterexamples to the predictions are not uncommon, given that actual tone values keep changing through time and there is no directionality for many suprasegmental changes. For instance, J. Marvin Brown (1965, 1975) demonstrated that the same etyma show two opposite tone values in two Thai dialects. In Mayan languages, it is observed that Proto-Mayan *\*h* led to high tone in Yucatec Maya, but low tone in Uspanteko, and no tone in Mocho' (Palosaari 2011:98). As the saying goes, "All models are wrong, but some are useful." Even though phonetic studies do not provide a conclusive directionality for suprasegmental change, they remain useful in demonstrating all kinds of possibilities.

### **2.5.2. Vietnamese**

Haudricourt (1954a) demonstrated that although modern Vietnamese is tonal, its proto language was atonal (indicated as "no tone" in Table 24). By comparing Vietnamese with other Mon-Khmer languages, Haudricourt concluded that the tones in Vietnamese originated from three different syllable codas regardless of the fact that vowels are the *de facto* tone carriers. These three types are (1) syllables that end in a proto vowel or nasal, (2) syllables that end in a proto voiceless fricative (\*\*-s > \*-h during the pre-

Vietnamese era), and (3) syllables that end in a proto voiceless glottal stop. Since then, Haudricourt (1954a) has become the canonical model in explaining tonogenesis in the ‘Far-East’. Note that Haudricourt (1954a) did not discuss the formation of Tone D, i.e., syllables ending in \*-p, \*-t, and \*-k, in Vietnamese.

**Table 24: The origin of Vietnamese tones (from Haudricourt 1954a)<sup>46</sup>**

Early Christian era (no tone)		6th century (three tones)	12th century (six tones)	Now
[earlier stage]	[later stage]			
pa sla	la	pa la	pa la	ba la
ba la		ba la	pà là	bà là
pas slas	pah lah	pà là	pả lả	bả lả
bas las	bah lah	bà là	pã lã	bã lã
paX <sup>47</sup> slaX	pa? la?	pá lá	pá lá	bá lá
baX laX	ba? la?	bá lá	pạ lạ	bạ lạ

Syllable types (2) and (3) (i.e., those ending in -h and -ʔ, respectively) led to contour pitch shapes, whereas type (1) (i.e., those ending in a vowel or nasal) led to a level pitch shape. Syllables with a proto voiceless fricative (type 2) show a falling pattern. By contrast, syllables with a proto glottal stop (type 3) show a rising pitch pattern. The pitch differences co-existed with the segmental differences in Vietnamese apparently for

<sup>46</sup> The diacritic “◌̣” marks voiceless sonorant, “◌̣̌” is for marking falling tone, and “◌̣̌” for rising tone during the three-tone period. In today’s Vietnamese orthography, <◌̣̌> is used to mark tone huyền, <◌̣̌> for tone sắc, <◌̣̌> for tone nặng, <◌̣̌> for hỏi, and <◌̣̌> for tone ngã. (huyền, sắc, nặng, hỏi, and ngã are names of the Vietnamese tones; also see Table 26.)

<sup>47</sup> X stands for unknown phonological material that had become a final glottal stop by the stage represented in the second column. (This footnote is part of the translated texts of Haudricourt 1954a by Brunelle).

some time. By the sixth century, the voiceless fricative and the glottal stop in the coda position were lost. Consequently, these pitch differences became phonemic/tonemic in Vietnamese, resulting in the development of three proto tones. Later tonal splits in Vietnamese are based on these three proto tones; thus these three proto tones are also referred to as proto tone categories. In addition, based on the Sinitic loans in Vietnamese, Haudricourt (1954a) attempted to account for the development of *Qùshēng* 去聲 (< \*-s) and *Shǎngshēng* 上聲 (< \*-ʔ) in Middle Chinese. This theory was widely adopted by Sinologists at later times.

The voicing of the initials also affects the pitch contours. When tones split according to the voicing of an initial, it is believed that a voiceless initial leads to a high tone, whereas a voiced initial leads to a low tone in Vietnamese. Hence, each proto tone category further split into two tones, resulting in six different tone values. These six tone values were associated with only three phonemic tones and co-existed with the initial voicing distinctions. Later, the initial voicing distinction disappeared, leading to six phonemic tones in Vietnamese (Haudricourt 1954a). That is, synchronically there are six tones in Vietnamese, but only three tone categories throughout the history of Vietnamese as we trace these tones back to their origins. Note that these voiced or voiceless initials, which conditioned further tonal splits at later times, did not necessarily have the same voicing quality as their proto forms.

### **2.5.3. Sino-Tibetan**

Following Haudricourt (1954a, 1954b), Mei (1970) and Pulleyblank (1962, 1963, 1973) came up with a similar scheme in explaining the tonal developments in Sinitic languages. Baxter (1992: 7) proposed that Old Chinese had the syllable shape

C<sub>1</sub>C<sub>2</sub>MVC<sub>3</sub>S where C stands for consonant, M for medial, V for vowel, S for suffix (including \*-s and \*-ʔ). Parallel to the tonal development attested in Vietnamese, tones became phonemic in Middle Chinese after the loss of Old Chinese suffixes, rendered in the shape C<sub>1</sub>MVC<sub>2</sub><sup>T</sup> where <sup>T</sup> stands for tone (see Table 25). Four phonemic tones *Pīng* 平 ‘level’ (< \*-N or zero coda), *Shǎng* 上 ‘rising’ (< \*-ʔ), *Qù* 去 ‘departing’ (< \*-s), and *Rù* 入 ‘entering’ (< other proto voiceless stop codas) were first mentioned by Shěn Yüe 沈約 (441-513 AD) whose terminology was kept and flourished in *Qieyùn* 切韻 (around the 7<sup>th</sup> century) by Lú Fǎyán 陸法言. The first three tones are also called *Shūshēng* 舒聲 ‘smooth tones’, whereas the last one is labeled as *Cùshēng* 促聲 or *Rùshēng* 入聲 ‘checked tones’.<sup>48</sup> Note that *Rùshēng* in Chinese rhyme books refers to both the syllable type (which ends in a non-glottal stop) and the tone category, whereas *Pīng*, *Shǎng*, and *Qù* are merely the tone categories.

**Table 25: The syllable canons in Old and Middle Chinese**

Old Chinese – Shijing 詩經	Middle Chinese (tonal) – Qieyun 切韻
C <sub>1</sub> C <sub>2</sub> MV(N) (N for proto nasals)	CMV(N) <sup>T</sup> ‘ <i>Pīngshēng</i> ’
C <sub>1</sub> C <sub>2</sub> MVC <sub>3</sub> ʔ	CMV <sup>T</sup> ‘ <i>Shǎngshēng</i> ’
C <sub>1</sub> C <sub>2</sub> MVC <sub>3</sub> S	CMV <sup>T</sup> ‘ <i>Qùshēng</i> ’
C <sub>1</sub> C <sub>2</sub> MVP (*-p, *-t, and *-k)	CMVP <sup>T</sup> ‘ <i>Rùshēng</i> ’

Scholars, if not following the Chinese philology tradition, consider that there were only three proto tone categories in Chinese, i.e., *Pīng*, *Shǎng*, and *Qù*. *Rù*, by their standard, is a syllable type, not a tone. Tone shapes on checked syllables are thus associated with the other three tones that are most similar phonetically, considering that the structures between ‘smooth syllables’ and ‘checked syllables’ are in complementary

<sup>48</sup> Moreover, *Shǎng*, *Qù* and *Rù* are grouped together under the name *Zèshēng* 仄聲 in the Chinese philology tradition.

distribution. It is worth noting that these four Chinese proto tones might have existed before Shěn Yüē 沈約 coined their names. Moreover, further tonal splits based on the voicing of the initial consonants were also recorded in the Chinese rhyme book, *Zhōngyuán Yīnyùn* 中原音韻, by Zhōu Déqīng 周德清 of the Yuán Dynasty in A.D. 1324 where the series associated with voiceless initials at the time of the split is labelled as *yīn* 陰 and the series with voiced initials as *yáng* 陽.

Based on Written Tibetan (the 7<sup>th</sup> century)<sup>49</sup> and Written Burmese (the 12<sup>th</sup> century), Matisoff (1973:78) concluded that the canonical syllable structure in proto-Tibeto-Burman should be (P<sub>1</sub>)(P<sub>2</sub>)C<sub>i</sub>(G)V(ˊ)(C<sub>f</sub>)(S) where P stands for prefix, C<sub>i</sub> for stem initial consonant, G for glide, ˊ for vowel length, C<sub>f</sub> for stem final consonant, and S for the suffix -s.<sup>50</sup> Similar to the case of Vietnamese, syllable-finals (post-codas)<sup>51</sup> in Proto-Tibeto-Burman caused different pitches to develop. After the loss of post-codas, these pitch differences were no longer predictable from the phonetic environments, resulting in phonemic tones. To put it in another way, if a Tibeto-Burman language preserves more archaic final clusters, it is likely to have few tones.

#### 2.5.4. Kra-Dai

Contemporary studies of historical Kra-Dai phonology are built on the foundation of Fang-kuei Li's 'Handbook of Comparative Tai' (1977), which marks the first attempt to reconstruct Proto-Tai. Among these languages, standard Thai/Siamese, which belongs to the Southwestern branch of Tai, is the most thoroughly studied. The earliest writing

<sup>49</sup> Matisoff (1973:81) stated that "the oldest attested TB language, Written Tibetan, shows no evidence of tonal distinctions at all."

<sup>50</sup> Note that these suffixes, a.k.a. appendix, are classified as "post-codas" in the literature.

<sup>51</sup> Proto voiceless stops in Old Chinese are dropped before the suffixes (Baxter 1992:309-324).

system of the Tai languages is the Thai scripts which reveal that (1) both tones and initial voicing contrast were phonemic at that time, and that (2) later tonal splits were associated with three initial consonant classes, i.e., high (aspirates), mid (non-aspirates plus preglottalized), and low (voiced).

The Thai orthography is believed to have been created by King Ramkhamhaeng พ่อขุนรามคำแหงมหาราช in A.D. 1283 (the 13<sup>th</sup> century). Like the Chinese tradition in classifying ‘smooth tones’ (those that end in a vowel or a nasal) and ‘checked tones’ (those ending in a stop), traditional Thai grammar uses ‘live syllable’ to refer to those with ‘smooth tones’, and ‘dead syllable’ for those with ‘checked tones’. Live syllables are associated with three tones - a zero marker for ‘basic’, ไ้เอก *may<sup>4</sup> ʔeek<sup>2</sup>* | (now written as ่ above vowels) for ‘primary’, and ไ้โท *may<sup>4</sup> thoo<sup>1</sup>* + (now written as ้ above vowels) for ‘secondary’, corresponding to Chinese *Píng* 平, *Qù* 去, and *Shǎng* 上, respectively.

F. Li (1977:24-29) suggested that the Tai tonal system resembles those of Chinese, Vietnamese, Miao-Yao/Hmong-Mien, etc., and the development of Proto-Tai tones must have followed the same path found in a good number of other tonal languages. Basing his tone category assignment on the existing Thai orthography, Li followed the Thai tradition and referred to these proto tones as A, B, C, and D where A, B, and C occur only in ‘smooth syllables’, and D in ‘checked syllables’. A detailed discussion on correspondence sets of these proto tone categories within the Kra-Dai language family is given in Ostapirat (1999, Chapter 3).



It is noteworthy that in the Thai orthography, Li's tone D is merely a syllable type (= dead syllable). Like tone A, there is no special tone marker designed for D. Tones A and D are distinguishable via their syllable structures. However, probably under the influence of the Chinese philological tradition, F. Li (1977:25) stated that "We set up a special tone class D for this type of syllable, because it is impossible to identify it with any of the other tones which have been set up for the other type of syllables."

Also note that the Proto-Tai tones A, B, C, and D correspond to the Middle Chinese tones *Pīng*, *Qù*, *Shǎng*, and *Rù* which, when converted using ABCD, follow the order A, C, B, and D (see Table 26). The mismatch of tone categories resulted from the fact that Chinese philology and Thai orthography, both of which predated the existence of modern historical linguistics, employed different orders when assigning tone categories. It is important to note that this correspondence does not imply that Tai and Sinitic are genetically related. Nor does it mean that Tai and Sinitic share the same tonogenesis. It is plausible that early Sinitic loans were borrowed into Thai, while *Qù* and *Shǎng* each bore similar tone shapes corresponding to Thai Tones B and Tone C, so Thai writing used ไม้เอก ่ to mark early Sinitic loans bearing *Qù* and ไม้โท ้ for those bearing *Shǎng*.

This dissertation follows the Tai convention, since F. Li (1977) has been extremely influential in the studies of Kra-Dai languages.

**Table 26: A summary of tone categories in Vietnamese, Chinese, and Tai**

Syllable Type based on Vietnamese	*-V, *-N	*-s/*-h	*-ʔ	*-p, *-t, *-k
Vietnamese	ngang-huyền	hỏi-ngã	sắc-nặng	sắc-nặng
Chinese Philology <sup>52</sup>	<i>Pīng</i> 平	<i>Qù</i> 去	<i>Shǎng</i> 上	<i>Rù</i> 入
Sinologist	A	C	B	D
Thai tradition	ໂມ້ 'basic'	ໂມ້ເອກ (may ʔeek) 'primary'	ໂມ້ໂກ (may tho) 'secondary'	ໂມ້ 'basic'
LI Fang-kuei (1977)	A	B	C	D
Chinese Philology	Shūshēng 舒聲 'smooth syllable'			Rùshēng 入聲 /Cūshēng 促聲 'checked syllable'
Thai tradition	live syllable			dead syllable

Based on the modern Tai languages, F. Li (1977) suggested that the loss of the voicing distinction of the earlier initials led to a further tonal split which influenced all Tai languages. Each tone split into two series, where series 1 is associated with earlier voiceless initials and series 2 with earlier voiced initials.<sup>53</sup> Note that here the voicing distinction refers to the laryngeal feature by the time the four tones split into eight, instead of that of the Proto-Tai initials. Following the split, Tone A, B, C, and D became A1, A2, B1, B2, C1, C2, D1, and D2. Since the loss of the voicing distinction was gradual, A1, B1, C1, D1 and A2, B2, C2, D2 must have been allotones for a period of time. F. Li (1977:26) also stated that “It is not known exactly when the two series became phonemic, and it is conceivable that the dates may vary according to dialects.”

<sup>52</sup> F. Li (1980:33) also used h and x respectively to mark syllables ending in \*-s and \*-ʔ.

<sup>53</sup> The series 1 corresponds to Chinese *yīn* 陰, whereas the series 2 corresponds to Chinese *yáng* 陽 discussed in the previous section.

Based on the vowel length distinction, Tone D can be further divided into two subcategories S (short vowel) and L (long vowel), resulting in DS1, DS2, DL1, and DL2, which reflect the earlier vowel length distinction at the time of the split.

Other laryngeal features such as glottalization and aspiration also trigger tonal splits. In addition to plain voiced, plain voiceless, and aspirated voiceless segments, F. Li (1943) documented a series of sounds, the tones of which indicate a voiceless initial at the time tonal splits took place, that have four types of phonetic realizations across the Tai languages. This series of sounds, reconstructed as preglottalized voiced segments, such as \*ʔb-, \*ʔd- and \*ʔj- in F. Li (1977), is realized in the Tai subgroup as (1) strongly preglottalized voiced stops, (2) weakly glottalized/pharyngealized voiced stops, (3) simple voiced, and (4) *l*- and *m*-. In addition to the Tai languages, Li (1948) also recorded preglottalized sounds in Sui, a Kra-Dai language which preserves many archaic features.

The correlation between initial voicing and tonal series is presented in Table 27.

Generally speaking, voiced initials led to tonal series 2 and voiceless and preglottalized sounds resulted in tonal series 1.

**Table 27: Initial voicing versus tonal series**

<b>Initial at the time of the tonal split</b>	<b>Tonal series</b>	<b>Voicing</b>
<b>voiced stops, and sonorants</b>	series 2	voiced
<b>aspirated and unaspirated voiceless stops, and voiceless sonorants</b>	series 1	voiceless
<b>preglottalized</b>	series 1	language-specific (preglottalized or voiced implosives)

Gedney (1972; reproduced in Table 28) demonstrated that four basic tone categories in Proto-Tai can further branch off into more than two tones in its daughter languages triggered by aspiration and glottalization, although these laryngeal features might not be

reconstructible to the proto stage.<sup>54</sup> It is the laryngeal features of the initial consonants at the time that phonetic tonal splits took place that matters.

**Table 28: Gedney's tone box (Gedney 1972:202)**

	<b>A</b>	<b>B</b>	<b>C (*-ʔ)</b>	<b>D-short</b>	<b>D-long</b>
<b>voiceless frication sounds, *s, hm, etc.</b>	1	5	9	13	17
<b>voiceless unaspirated sounds, *p, t, k</b>	2	6	10	14	18
<b>glottal sounds, *ʔ, ʔb, etc.</b>	3	7	11	15	19
<b>voiced sounds, *b, m, l, etc.</b>	4	8	12	16	20

In addition to the letter system, numerals are also used to refer to tones (see Table 29).

**Table 29: The letter system and the numeric system in Kra-Dai**

	<b>A (*-V, *-N)</b>	<b>B (*-s/*-h)</b>	<b>C (*-ʔ)</b>	<b>D (*-p, *-t, *-k)</b>	
<b>voiceless</b>	A1=1	B1=5	C1=3	DS1=7	DL1=9
<b>voiced</b>	A2=2	B2=6	C2=4	DS2=8	DL2=10

Note that different scholars might use numerals differently, so one must pay attention to the convention used in the materials they cite. For example, Gedney's well-known tone box for Proto-Tai tones employs another numeral convention.

Another example is provided in Table 30 which presents the tonal system of Tongza Hlai, based on Ouyang & Zheng (1980:88) and Ostapirat (2008). Apparently, when Ouyang & Zheng (ibid.) first investigated this language, the numerals they employed to mark tone categories were purely synchronic. For this reason, when discussed in a Kra-Dai perspective, 5 and 2 match Tone B1 and Tone B2 respectively, instead of 3 and 4 as those in Table 29.

<sup>54</sup> Note that recent studies (Liang and Zhang 1993, Pittayaporn 2009, among others) show that aspiration is not phonemic in Proto-Tai (cf. F. Li 1977 in which aspiration is phonemic). Aspiration found in some of the modern Tai languages is a secondary development.

**Table 30: Tongza Tones**

Tone category	A1	A2	B1	B2	C1	C2	D1	D2
Numeric tone notation	1	4	5	2	3	6	7	8
Tone value	33	11	51	131	55	14	55	13

In Table 31 an additional prime in Edmondson (1988:8) was used to mark the tonal split initiated by aspiration in series 1. By contrast, a prime was used to mark the tonal split caused by an earlier vowel length distinction in the Longtang (龍塘) variety of Ong-Be (see Liang & Zhang 1997:35).

**Table 31: The Kam-Sui tones (Edmondson and Solnit 1988:8)**

Proto-Kam-Sui	A	C	B (*-ʔ)	D(short)	D(long)
modern Kam-Sui					
voiceless, glottalized	1	3	5	7	9
aspirated (if distinct)	1'	3'	5'	7'	9'
voiced	2	4	6	8	10
Proto-Tai	A	C	B	D(short)	D(long)
Chinese	Ping	Shang	Qu	Ru	Ru

### 2.5.5. Remaining issues

After reading Haudricourt (1954a, b), Mei (1970), Pulleyblank (1973), and Baxter (1992), among others, one might start to wonder if tones in Middle Chinese arose out of affixation, in which Old Chinese unsuffixed forms resulted in *Pīngshēng* or *Rùshēng*, and suffixed forms in *Shǎngshēng* and *Qùshēng* (see Table 32 for the development of *Qùshēng*). If this is the case, the tonal development in Chinese becomes a morphophonological instead of solely phonological evolution. The final -s can be part of the root, not necessarily a suffix, illustrated by ནས་ *nas* ‘Tibetan barley (*Hordeum vulgare trifurcatum*)’, although Baxter (1992:315-317) pointed out in Tibetan the \*-s suffix also carried various functions. However, the glottal stop functioning as a grammatical suffix is not found among Tibetan languages (You-Jing Lin 2015, p.c.). Baxter (1992:324) also mentioned that “the derivational suffix \*-ʔ, if there really was one, seems to have lost its

productivity early...” The function of \*-ʔ remains unknown in Chinese.<sup>55</sup> It is not clear to me whether the glottal stop is considered a suffix due to a phonotactic constraint in Old Chinese (via an analogy with the \*-s suffix).

**Table 32: Reconstructed OC word-pairs showing basic (underived) and \*-s-suffixed forms (from Haudricourt 1954b)**

basic		with suffixed *-s	
*âk	bad, evil	*âks	to hate
*xâu	good	*xâus	to love
*dâk	to measure	*dâks	a measure
*ʃi	to send	*ʃis	envoy

Matisoff (1973:78-79) observed that in Tibeto-Burman languages prefixes and stem-initials assimilate in terms of voicing. Hyslop (2009) demonstrated that the ongoing tonogenesis in Kurtöp is first triggered by the merger of voiced sonorants with voiceless sonorants originated from an early voiced sonorant prefixed by s- (via a comparison with written Tibetan). To put it in another way, it is attested that tonal development can be morphophonological. Also in the Vietic language, consonant clusters, including those resulting from prefixation, show the same pattern in tonal splits (A. Michaud, 2015 p.c.). It is the surface phonetic strings that matter for tonal developments regardless of their actual origins.

Since the laryngeal features of the initials at later times are able to trigger further tonal splits, we might ask how about the finals? It is generally believed that proto tones develop out of different final consonants. Although it is common that tones first develop out of proto finals, it is not attested that later tonal splits are caused by finals (A.

Michaud 2015, p.c.). A way to view this is that the proto tones became phonemic due to

<sup>55</sup> Mei (1970:89) listed several Sinitic languages in which a final glottal stop is observed in the rising tone, which he believes, are remnants of the Old Chinese glottal stop. These languages include Wenchou 温州 (Wu), Pucheng 浦城 (Wu), Jianyang 建陽 (Min), Ting'an 定安 (Min), and Wenchang 文昌 (Min). Nevertheless, it is not uncommon for a glottal stop to arise from certain pitch contours, such as a low-level tone, or a falling-rising tone.

the loss of proto finals, and there could be either nothing else left in the coda position or the reshaping of tone values is purely phonetic. Pittayaporn (2009) and Thepboriruk (2015) both demonstrated that tones in Thai keep reshaping without leading to the development of other ‘phonemic’ tones.

Different proto tones developed out of different codas, but it was not until the loss of these codas that pitch difference became phonemic. Since all modern Kra-Dai languages are tonal, the comparative method is not able to recover the syllable appendixes of atonal Proto-Kra-Dai. Also, the directionality of suprasegmental changes is yet to be developed, if possible at all. It is noteworthy that although nasal or vowel codas led to the development of proto Tone A, these codas are also found in Tones B and C nowadays. However, words ending in nasals or vowels/approximants “are attested less and less in tones B and C (especially tone C) as we go back in time” (Ostapirat 2015, p.c.). That is, most of those found in Tones B and C are lexical innovations at later times.

One might also question whether all of the protolanguages at issue allowed a fricative and/or a glottal stop in the coda position. The answer is yes to Vietic languages (based on comparison with other Austroasiatic languages) and to Chinese languages (based on comparison with Tibeto-Burman). However, given that phonemic tones are compensation for the loss of codas, and that there are only ca. 25 attested cognates shared by Kra-Dai and Austronesian to show recurrent sound correspondences,<sup>56</sup> we will never have a concrete answer unless additional cognates should be discovered.

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<sup>56</sup> Benedict (1942, 1975), Gedney (1976), Reid (1984-85), Thurgood (1994), Sagart (2004), and Ostapirat (2005a, 2013) all talk about the relationship between Austronesian and Kra-Dai. Small-scaled regular sound correspondences have been presented in Ostapirat (2005a), which provides solid ground for this distant genetic relationship.

Besides, scholars of historical Tai phonology have split opinions on the finals of Tones B and C. For example, F. Li (1977), Gedney (1989), and Pittayaporn (2009) supported the view that Tone B ended with a fricative and Tone C was derived from a glottal stop, whereas Sagart (1988) argued that Tone B originated from a glottal stop final and Tone C contained creaky voice. Despite a lack of a consensus regarding Proto-Kra-Dai syllable codas, the explanatory function of proto tone categories ABCD cannot be downplayed in understanding the tonal splits in Kra-Dai. What is important is when it comes to tone categories, words belonging to the same tone groups (= possessing the same tone values and/or phonation types) change together as a unit throughout history, parallel to segmental sound change.

Furthermore, it is well attested that “once it is established, the tonal system evolves without regard for its old etymological pitch levels” (Haudricourt 1961). J. Marvin Brown (1965, 1975) showed that Thai ‘high consonants’ (proto voiceless aspirates) and ‘low consonants’ (proto voiced stops and sonorants) are associated with high tones and low tones respectively in Northern Thai, but with low tones and high tones respectively in Bangkok Thai. That is, tonal reflexes of the same cognate sets can have very divergent tone values in the related varieties. In the Lincheng (臨城) variety of Ong-Be, Kra-Dai Tone B (\*-s/\*-h) and Tone C (\*-ʔ), both of which were probably contour tones based on the tonogenesis model, have merged, and Tone BC is realized as level tones (B1=C1=33, B2=C2=11). Pittayaporn (2009:245) also mentioned that B2 and C1 merged in Southern Shan, which again shows that synchronic realizations of tones are independent of their etymological origins.



Likewise, the synchronic changes of laryngeal features of initials are independent of their proto forms. A further tonal split can be conditioned by the loss of the initial voicing contrast, where voiced stops merged with voiceless stops, and voiceless sonorants merged with voiced sonorants at the time the split took place. Take Ong-Be for instance. A merger of early voiceless stops and voiced stops into voiced implosives, and a merger of early voiceless sonorants with voiced sonorants has been observed. In Modern Khmer, early voiceless stops become voiced implosives whereas early voiced stops become voiceless stops (Haudricourt 1965). The successful reconstruction of early phonemes in tonal languages can be achieved only when both segmental and suprasegmental features are taken into account.

Last, whether Tone D should form a category has long been controversial. Vietnamese and Thai orthographies do not consider it an independent category. By contrast, the Chinese philosophical tradition has granted it an independent status. Haudricourt (1961) encoded the notion of ‘architoneme’, i.e., the neutralization of phonemic tonal contrasts in a given environment, in order to bridge the tonal contrasts in smooth syllables and checked syllables where the syllable types are in complementary distribution. An architoneme is a category that consists of several phonemic tones (e.g., Tone D is an architoneme of Tone ABC), and the realization of an architoneme can be either identical to the realization of a particular phonemic tone or a realization of its own tone value. Interestingly, in Tai and Chinese Tone D (\*-p, \*-t, and \*-k) tends to pattern with Tone B (\*-s/\*-h), as demonstrated in Chamberlain (1975), Gedney (1989), and Pittayaporn (2009, Chapter 6). However, in Northern Vietnamese varieties Tone D patterns with Tone C (\*-ʔ), as reflected in the Vietnamese orthography *quốc ngữ* (cf. A. Michaud

(2004:143) which showed that Tones D1 and D2 are not glottalized, i.e., stop codas that are not accompanied by a final glottal constriction, whereas “Tone B2 [=C2 in Kra-Dai] is characterized by a gesture of strong constriction that is distinct from creaky voice”). Tone D as an independent category is useful for ease of cross-linguistic comparison because as an architoneme of Tones A, B, and C, irregular correspondences might result, considering that synchronically Tone D could have the same pitch value as Tone A in Language X, but as Tone B in Language Y, and as Tone C in Language Z, etc. Therefore, Tone D is recognized as an independent category in this dissertation.

### Chapter 3. The Phonological systems of contemporary Ong-Be varieties

This chapter introduces the phonological systems of contemporary Ong-Be varieties which are further divided into seven subdivisions according to their phonological features, such as the existence of aspirated stops and the alveolo-palatal nasal, and the number of vowels and tones.

#### 3.1. Introduction

The syllable structure of modern Ong-Be varieties is canonically CV(C)<sup>T</sup>,<sup>57</sup> a pattern which lacks the vowel length distinction. No consonant clusters are allowed in either onset or coda. All consonants can function as onsets, but only glides, non-palatal nasals (if any) and stops occur in codas, and all the stop codas are voiceless and unreleased. In terms of segmental features, the major differences among Ong-Be varieties are: (1) the number of vowels, specifically the existence of the following contrasts: /a/ versus /ɑ/ or /ə/, and /e/ versus /ɛ/, (2) the lenition of voiceless aspirated stops, such as /p<sup>h</sup>/ versus /f/, and /k<sup>h</sup>/ versus /x/, and (3) the presence/absence of alveolo-palatals, i.e. /ɲ/ (alveolo-palatal) versus /n/ (alveolar), and /ʃ/ (alveolo-palatal) versus /z/ (alveolar).

With respect to suprasegmental features, there are six basic tone categories in Ong-Be (A1, A2, BC1, BC2, D1, and D2), four of which are non-checked tones (A1, A2, BC1, BC2) and two are checked tones (D1 and D2, which only occur in syllables ending in a stop coda). Chinese scholars tend to use numerals to refer to each tone category. Hence, A1, A2, BC1, BC2, D1, and D2 are rendered as 1, 2, 3, 4, 7 and 8 respectively. There is no distinction between proto Tone B (B1=5, B2=6) and Tone C (C1=3, C2=4) in Ong-Be. Hence I label these two tone categories as Tone BC.

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<sup>57</sup> C stands for consonant, V for vowel, and <sup>T</sup> for tone. Diphthongs are treated as single phonemes.

Based on the data I gathered as well as published materials, the Ong-Be varieties spoken in Haikou City (including Qionghshan County) form three subdivisions, all of which belong to Eastern Ong-Be. Longqiao, Longquan, and Longtang form one group because they all show further tonal splits in tones A1, D1 and D2. Yongxing and Shishan form another group because tonal splits are only attested in tone D1. Changliu, by contrast, has no further tonal split at all.

As for the Ong-Be varieties spoken in northeastern Chengmai County, I use Laocheng in Zhang et al. (1985) because I did not have access to native speakers. In this dissertation, Laocheng is categorized as belonging to the Eastern Ong-Be subgroup. Qiaotou of northwestern Chengmai, which I had access to, on the other hand, represents the varieties of northwestern Chengmai, together with the varieties in Lingao and Danzhou constituting the Western subgroup.

With respect to the Ong-Be varieties in Lingao, three subdivisions are proposed as well, even though all of them are mutually intelligible and belong to Western Ong-Be. In Lingao County, Huangtong and Maniao form a subdivision because they both show the /-ʒ/ alternation unattested elsewhere (see Chapter 5). This might be attributed to language contact since the Ong-Be varieties to the east of Huangtong and Maniao use /z/ or /ʒ/, whereas the varieties to the west of them consistently employ /l/ in the same cognate sets. Xinying and Diaolou (including Meiliang) form a group because they are the only varieties in Lingao that preserve voiceless labial and velar aspirated stops. The rest of the varieties, namely Dongying in Zhang et al. (1985), Lincheng in Liang and Zhang (1997), Bolian in Liu (2000), and Jialai, which I did fieldwork on, form one group.

The phonological system of each of the above-mentioned subdivisions, based on my fieldwork unless otherwise noted, is introduced in what follows. Note that the phonology of the Sino-Ong-Be stratum is not included and will not be discussed in this study.

### **3.2. Haikou City**

This section provides an overview of Ong-Be varieties spoken in Haikou City. Six dialects are divided into three subdivisions, based on the number of splits in Tone D.

#### **3.2.1. The Longqiao-Longquan-Longtang subdivision**

The phonology of Longtang is given in Table 33 - Table 35 as the representative of the Longqiao-Longquan-Longtang subdivision. It has two rising tone patterns and three level patterns. Tones A and D show tonal split, which was caused by an earlier vowel length distinction. There are 18 consonants found in Longtang, including three nasals (/m/, /n/ and /ŋ/), two implosives (/ɓ/ and /ɗ/), four voiceless stops (/p<sup>h</sup>/, /t/, /k/, and /k<sup>h</sup>/), a glottal stop (/ʔ/), three fricatives (/v/, /s/, and /z/), /h/, one affricate (/ts<sup>(h)</sup>/), one lateral /l/, and two glides /j/ and /w/. Among these consonants, voiceless aspirated stops, i.e., /p<sup>h</sup>/ and /k<sup>h</sup>/, can be pronounced as [pf], [p<sup>h</sup>], or [f], and as [kx], [k<sup>h</sup>] or [x],<sup>58</sup> respectively, depending on speaker. As for /ts<sup>(h)</sup>/, it can be realized as either [ts] or [ts<sup>h</sup>].

It is not uncommon to find languages with a three-way distinction between stops (voiced stops, voiceless unaspirated stops, and voiceless aspirated stops), such as /b/ ([ɓ]), /p/, and /p<sup>h</sup>/ in Thai. However, the stop onsets in Longtang, as well as those in the rest of the Ong-Be varieties, are asymmetrical as noted in Solnit (1982) because they all lack /p/ and /t<sup>h</sup>/ in the onset position, but preserve /b/. Although the onset *b*- and *p<sup>h</sup>*- and the

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<sup>58</sup> Liang & Zhang (1997:23) used /f/ and /x/ for what I categorize as voiceless aspirated stops. They stated that /f/ can be pronounced as [f], [pf], or [p<sup>h</sup>], and /x/ can be realized as [x], [kx] or [k<sup>h</sup>], varying from speaker to speaker.

coda *-p* have different origins in the history, they show a complementary distribution in a synchronic perspective, because [b] and [p<sup>h</sup>] only occur syllable-initially and [p] syllable-finally. Hence I consider [p] the allophone of either /b/ or /p<sup>h</sup>/ when discussing the synchronic phonology of Ong-Be. A similar distribution is found in the velar coda where [k] can be regarded as an allophone of /k/ or /k<sup>h</sup>/, given that stop codas in Ong-Be are always voiceless and unreleased.

**Table 33: The Consonant Inventory of Longtang**

	bilabial	labiodental	alveolar	palatal	velar	glottal
nasals	m		n		ŋ	
stops	p <sup>h</sup> b		t d		k k <sup>h</sup>	ʔ
fricatives		v	s z			h
affricates			ts <sup>(h)</sup>			
laterals			l			
approximants	w			j		

Longtang contains nine monophthongs (see Table 34), with the mid vowels further divided into open-mid (/ɛ/ and /ɔ/) and close-mid (/e/ and /o/). There is also a two-way contrast in low vowels, namely /a/ and /ə/. In addition, Longtang has two dithphongs, /ia/ and /ua/.

**Table 34: Monophthongs in Longtang**

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

Following the tonal arrangements and order used in Liang and Zhang (1997), the nine tones in Longtang (exclusive of grammatical tones and tones found only in Chinese loans), which is the most complex in the entire Ong-Be speaking region, are given below. It has two rising patterns and three level patterns. Tones A and D show tonal splits, which was caused by an earlier vowel length distinction.

**Table 35: Tones in Longtang**

Tone category	Tones	Citation Form	Examples
A1	1	13	da <sup>13</sup> 'eye'
A1	1'	44	ten <sup>44</sup> 'teeth'
A2	2	33	mo <sup>33</sup> 'hand'
BC1	3	24	na <sup>24</sup> 'face'
BC2	4	11	lin <sup>11</sup> 'tongue'
D1	7	13	ba <sup>13</sup> 'mouth'
D1	7'	44	fo <sup>44</sup> 'fart'
D2	8	11	no <sup>11</sup> 'bird'
D2	8'	33	ke <sup>33</sup> 'frog'

### 3.2.2. The Yongxing-Shishan subdivision

The consonant inventory of Yongxing contains 18 segments (see Table 36). There are three nasals (/m/, /n/, and /ŋ/), two implosives (/ɓ/ and /ɗ/), four voiceless stops (/p<sup>h</sup>/, /t/, /k/, and /k<sup>h</sup>/), /ʔ/, three fricatives (/v/, /s/, and /z/), /h/, one affricate /ts<sup>(h)</sup>/ which has two phonetic variants [ts] and [ts<sup>h</sup>], one lateral /l/, and two glides /w/ and /j/.

**Table 36: The Consonant Inventory of Yongxing**

	bilabial	labiodental	alveolar	palatal	velar	glottal
<b>stops</b>	p <sup>h</sup> b		t d		k k <sup>h</sup>	ʔ
<b>nasals</b>	m		n		ŋ	
<b>affricates</b>			ts <sup>(h)</sup>			
<b>fricatives</b>		v	s z			h
<b>laterals</b>			l			
<b>approximants</b>	w			j		

Table 37 presents a vowel inventory consisting of eight monophthongs, including four front vowels (/i/, /e/, /ɛ/, and /a/), three back vowels (/u/, /o/, and /ɔ/), and one central vowel /ə/. Yongxing also has two diphthongs /ia/ and /ua/. When compared with Xin (2011) mentioned in Chapter 2, Shishan differs from Yongxing in having /e/ and /io/.

**Table 37: Monophthongs in Yongxing**

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

There are seven tones in Yongxing, as in Shishan. Table 38 demonstrates that Tone D1 split into two sub-tones in Yongxing (as well as Shishan).

**Table 38: Tones in Yongxing**

Tone category	Tones	Citation Form	Examples
A1	1	213	ton <sup>213</sup> ‘teeth’
A2	2	44	mo <sup>44</sup> ‘hand’
BC1	3	24	na <sup>24</sup> ‘face’
BC2	4	21	lin <sup>21</sup> ‘tongue’
D1	7	21	bak <sup>21</sup> ‘mouth’
D1	7’	55	ɬot <sup>55</sup> ‘fart’
D2	8	33	nok <sup>33</sup> ‘bird’

### 3.2.3. The Changliu subdivision

Table 39 presents the consonant inventory of Changliu. There are three nasals (/m/, /n/, and /ŋ/), two implosives (/b/ and /ɗ/), four voiceless stops (/p<sup>h</sup>/, /t/, /k/, and /k<sup>h</sup>/), /ʔ/, two fricatives (/s/ and /z/), /h/, one affricate (/ts<sup>(h)</sup>/), one lateral (/l/), and two glides (/w/ and /j/). Phonemic voiceless aspirates /p<sup>h</sup>/ and /k<sup>h</sup>/ are found in Changliu. The phoneme /ts<sup>(h)</sup>/ can be pronounced as [ts<sup>h</sup>] or [ts] in Changliu, although [ts<sup>h</sup>] is more common. /s/ and /z/ in Changliu are palatalized to [ɕ] and [ʑ] before non-low front vowels /i/ and /e/. It is noteworthy that Changliu lacks /v/ attested in the rest of the Ong-Be varieties because it has merged with /b/.



**Table 39: Consonant Inventory of Changliu**

	<b>bilabial</b>	<b>alveolar</b>	<b>palatal</b>	<b>velar</b>	<b>glottal</b>
<b>stops</b>	p <sup>h</sup> b	t d		k k <sup>h</sup>	ʔ
<b>nasals</b>	m	n		ŋ	
<b>affricates</b>		ts <sup>(h)</sup>			
<b>fricatives</b>		s z			h
<b>laterals</b>		l			
<b>approximant</b>	w		j		

Table 40 shows that there are 10 monophthongs and two diphthongs /ia/ and /ua/ in Changliu. This system has a finer distinction in mid, central and low vowels, and the close-mid vowels /e/ and /o/ are realized in close proximity to their high counterparts /i/ and /u/. Also as noted in Xin (2008), among today's Ong-Be varieties, only Changliu has /w/.

**Table 40: Monophthongs in Changliu**

	<b>Front</b>	<b>Central</b>	<b>Back</b>
<b>high</b>	i	ɯ	u
<b>close-mid</b>	e	ə	o
<b>open-mid</b>	ɛ		ɔ
<b>low</b>	a		ɑ

There are six tones in Changliu as shown in Table 41. Note that there are no later tonal splits, unlike those listed in the previous subdivisions. Changliu does not have real falling tones, such as 31 or 51 (which holds true in most of the Ong-Be varieties as well).

**Table 41: Tones in Changliu**

<b>Tone category</b>	<b>Tones</b>	<b>Citation Form</b>	<b>Examples</b>
A1	1	35	tɔn <sup>35</sup> 'teeth'
A2	2	24	me <sup>24</sup> 'hand'
BC1	3	33	na <sup>33</sup> 'face'
BC2	4	21	lin <sup>21</sup> 'tongue'
D1	7	55	bak <sup>55</sup> 'mouth'
D2	8	21	dut <sup>21</sup> 'fart'

### 3.3. Chengmai County

This section presents a phonological sketch of two Ong-Be varieties spoken in Chengmai County, one based on Zhang (1985) and the other based on my fieldwork.

### 3.3.1. Laocheng

The phonology of Laocheng, as shown in Table 42 - Table 44, is modified from Zhang et al. (1985), where certain vowels are reanalyzed as glides and non-native tones are omitted (also cf. Table 10 - Table 12 in Chapter 2. As listed in Table 42, there are 18 consonants in Laocheng, three nasals (/m/, /n/, and /ŋ/), two implosives (/b/ and /d/), two voiceless stops (/t/ and /k/), /ʔ/, five fricatives (/f/, /v/, /s/, /z/, and /x/) plus /h/, one affricate (/ts/), one lateral (/l/), and two glides (/w/ and /j/). Phonemic aspiration is not attested in Laocheng, unlike the Ong-Be varieties in Haikou.

**Table 42: The consonant inventory of Laocheng modified from Zhang et al. (1985)<sup>59</sup>**

	<b>bilabial</b>	<b>labiodental</b>	<b>alveolar</b>	<b>palatal</b>	<b>velar</b>	<b>glottal</b>
<b>stops</b>	b		t d		k	ʔ
<b>nasals</b>	m		n		ŋ	
<b>affricates</b>			ts			
<b>fricatives</b>		f v	s z		x	h
<b>laterals</b>			l			
<b>approximants</b>	w			j		

As shown in Table 43, Laocheng has seven monophthongs. It shows a two-way contrast only in mid back vowels. Among four diphthongs, i.e., /ia/, /ua/, /ie/, and /io/, the diphthong /io/ seems to occur mostly in Chinese loans and it remains unclear to me if it also occurs in the native stratum.

**Table 43: Monophthongs in Laocheng modified from Zhang et al. (1985)**

	<b>front</b>	<b>central</b>	<b>back</b>
<b>high</b>	i		u
<b>mid</b>	ɛ	ə	o
<b>low</b>	a		

<sup>59</sup> The approximants in this table is analyzed as vowels in Zhang et al. (1985), hence not included in their inventory of initials.

Laocheng has six tones, consisting of two rising tonal patterns and three level tonal patterns. No real falling tones are observed. No further tonal splits are found.

**Table 44: Tones of Laocheng modified from Zhang et al. (1985)**

Tone Category	Tones	Citation Form	Examples
A1	1	35	ton <sup>35</sup> 'teeth'
A2	2	33	mo <sup>33</sup> 'hand'
BC1	3	13	na <sup>13</sup> 'face'
BC2	4	21	lin <sup>21</sup> 'tongue'
D1	7	55	ba <sup>55</sup> 'mouth'
D2	8	21	da <sup>21</sup> 'fart'

### 3.3.2. Qiaotou

Qiaotou of western Chengmai County has 18 consonants (Table 45), including three nasals (/m/, /n/, and /ŋ/), two implosives (/ɓ/ and /ɗ/), two voiceless stops (/t/ and /k/), the glottal stop (/ʔ/), five fricatives (/f/, /v/, /s/, /z/, and /x/), /h/, one affricate (/ts<sup>(h)</sup>/), one lateral (/l/), and two glides (/w/ and /j/). The voiced coronal fricative /z/ in Qiaotou is palatalized, which is different from the phoneme /z/ found in Haikou and eastern Chengmai. The velar fricative /x/ can be pronounced as [x] or [kx], depending on speaker. The affricative /ts/ can be aspirated or unaspirated. Similar to Laocheng, Qiaotou does not have phonemic aspiration.

**Table 45: The consonant inventory of Qiaotou**

	bilabial	labiodental	alveolar	palatal	velar	glottal
<b>stops</b>	ɓ		t d		k	ʔ
<b>nasals</b>	m		n		ŋ	
<b>affricates</b>			ts <sup>(h)</sup>			
<b>fricatives</b>		f v	s	ʃ	x	h
<b>laterals</b>			l			
<b>approximants</b>	w			j		

As seen in Table 46, there are seven monophthongs in Qiaotou and two diphthongs, i.e., /ia/ and /ua/. The diphthong /ia/ is often raised to [iɛ] before an alveolar coda.

**Table 46: Monophthongs in Qiaotou**

	front	central	back
high	i		u
mid	ɛ	ə	o ɔ
low	a		

Qiaotou contains six phonemic tones, with two level patterns and two contour ones. The contour tones, i.e., 213 and 324, can be reduced to a low-falling tone for the former and a rising tone for the latter, varying from speaker to speaker. Tone 4 in Qiaotou is the only Tone 4 that is realized as a high tone, whereas a low-level tone is found in the rest of the Ong-Be varieties described in this study.

**Table 47: Tones of Qiaotou**

Tone Category	Tones	Citation Form	Examples
A1	1	21(3)	tən <sup>21(3)</sup> ‘teeth’
A2	2	(3)24	mo <sup>(3)24</sup> ‘hand’
BC1	3	33	na <sup>33</sup> ‘face’
BC2	4	55	lin <sup>55</sup> ‘tongue’
D1	7	33	ɓak <sup>33</sup> ‘mouth’
D2	8	55	ɗut <sup>55</sup> ‘fart’

### 3.4. Lingao County

Lingao County hosts the greatest number of speakers of Ong-Be. Based on the published materials and my fieldwork, I divide varieties here into three subdivisions, the phonological sketch of which will be introduced in the following sections.

#### 3.4.1. The Dongying-Lincheng-Bolian-Jialai subdivision

Ong-Be spoken in central and southern Lingao County has received the most attention, including Dongying (Zhang et al. 1985), Lincheng (Liang & Zhang 1997), and Bolian (Liu 2000). This subdivision is represented by the phonology of Lincheng Town because it is the socio-economic center of Lingao County. Its consonant inventory, which is composed of 19 consonants, is shown in Table 48. There are two plain voiceless stops

(/t/ and /k/) plus /ʔ/, two implosives (/ɓ/ and /ɗ/), one alveolar affricate /ts/ which has two variants [ts] and [ts<sup>h</sup>], five fricatives (/f/, /v/, /s/, /z/, and /x/) plus /h/, four nasals (/m/, /n/, /ɲ/, and /ŋ/), one lateral (/l/), and two glides (/w/ and /j/). All the stops and affricates are phonemically unaspirated. The affricate becomes [tɕ] or [tɕ<sup>h</sup>] before a high front vowel. As for /f/, it shows variants [f], [pf], and [ɸ].

**Table 48: The Consonant Inventory of Lincheng modified from Liang & Zhang (1997)<sup>60</sup>**

	bilabial	labio-dental	alveolar	alveolo-palatal	velar	glottal
<b>stops</b>	ɓ		t    ɗ		k	ʔ
<b>nasals</b>	m		n	ɲ	ŋ	
<b>affricates</b>			ts <sup>(h)</sup>			
<b>fricatives</b>		f    v	s	z	x	h
<b>laterals</b>			l			
<b>approximants</b>	w			j		

Table 49 presents a summary of the vowels in which three front vowels (/i/, /ε/ and /a/), three back vowels (/u/, /o/ and /ɔ/), one central vowel (/ə/), and two diphthongs (/ia/ and /ua/) are found.

**Table 49: Monophthongs in Lincheng modified from Liang & Zhang (1997)**

	Front	Central	Back
<b>high</b>	i		u
<b>close-mid</b>		ə	o
<b>open-mid</b>	ε <sup>61</sup>		ɔ
<b>low</b>	a		

Lincheng has six native tones, which can be decomposed into four pitch values (one contour (213) and three level tones (55, 33, and 21)), exclusive of grammatical tones and tones from the Sino-Ong-Be stratum.

<sup>60</sup> Approximants are not included in Liang & Zhang's inventory of initials because they analyzed them as vowels.

<sup>61</sup> Liang & Zhang transcribed this vowel as /e/.

**Table 50: Tones in Lincheng modified from Liang & Zhang (1997)**

Tone Category	Tones	Citation Form	Examples
A1	1	213	tin <sup>213</sup> 'teeth'
A2	2	55	mo <sup>55</sup> 'hand'
BC1	3	33	na <sup>33</sup> 'face'
BC2	4	21	lin <sup>21</sup> 'tongue'
D1	7	33	bak <sup>33</sup> 'mouth'
D2	8	55	ɬut <sup>55</sup> 'fart'

### 3.4.2. The Huangtong-Maniao subdivision

The Huangtong-Maniao subdivision shares an identical consonant and vowel inventory with Lincheng. However, this subdivision has falling tones not attested in Lincheng. The high-level tone in Lincheng corresponds to a high-level or high-falling tone, and the mid-level tone to a mid-level or mid-falling tone in this region.

**Table 51: Tones in Huangtong**

Tone Category	Tones	Citation Form
A1	1	213
A2	2	51
BC1	3	31
BC2	4	21
D1	7	33~31
D2	8	55~53

### 3.4.3. The Xinying-Meiliang-Diaolou subdivision

Xinying represents the Xinying-Meiliang-Diaolou subdivision in Lingao County. Its consonant inventory includes 18 segments, as shown in Table 52 (cf. Hashimoto 1980). Within the western Ong-Be subgroup, this subdivision is the only one that maintains phonemic aspiration, i.e., /p<sup>h</sup>/ and /k<sup>h</sup>/, which have spirantized to /f/ and /x/ elsewhere. In Xinying, the phoneme /ts<sup>(h)</sup>/ has two variants, [ts<sup>h</sup>] and [ts], with the aspirated variant having a wider distribution. However, Xinying lacks the phoneme /ŋ/ attested in Meiliang and Diaolou (and the rest of the varieties spoken in Lingao County).

**Table 52: Consonant Inventory of Xinying**

	<b>bilabial</b>	<b>labio-dental</b>	<b>dental/ alveolar</b>	<b>alveolo-palatal</b>	<b>velar</b>	<b>glottal</b>
<b>stops</b>	p <sup>h</sup> b		t d		k k <sup>h</sup>	ʔ
<b>nasals</b>	m		n		ŋ	
<b>affricates</b>			ts <sup>(h)</sup>			
<b>fricatives</b>		v	s	ʃ		h
<b>laterals</b>			l			
<b>approximants</b>	w			j		

As presented in Table 53, there are seven monophthongs and two diphthongs (/ia/ and /ua/) in Xinying. Although it has been reported in various sources that early /o/ has merged with /ɔ/ (see Hashimoto 1980; Zhang et al. 1985, Liang & Zhang 1997, among others), my Xinying consultant from Cangmi village 倉米村 shows a /o/-/ɔ/ contrast. I suggest that this is due to dialectal difference within this area where the distinction is lost in most villages while a few still maintain it.

**Table 53: Monophthongs in Xinying**

	<b>Front</b>	<b>Central</b>	<b>Back</b>
<b>high</b>	i		u
<b>close-mid</b>		ə	o
<b>open-mid</b>	ɛ		ɔ
<b>low</b>	a		

There are four tones in non-checked syllables and two tones in checked syllables, as indicated in Table 54. Tone A1 is a falling-rising tone which is accompanied by a strong glottal constriction. No real falling tones are found.

**Table 54: Tones in Xinying**

<b>Tone Category</b>	<b>Tones</b>	<b>Citation Form</b>	<b>Examples</b>
A1	1	213	tin <sup>213</sup> 'teeth'
A2	2	55	mɔ <sup>55</sup> 'hand'
BC1	3	33	na <sup>33</sup> 'face'
BC2	4	21	lin <sup>21</sup> 'tongue'
D1	7	33	ɓak <sup>33</sup> 'mouth'
D2	8	55	ɗut <sup>55</sup> 'fart'

## Chapter 4. Ong-Be tones and internal subgrouping

### 4.1. Ong-Be tones

This section deals with the tonal development in Ong-Be, with a focus on its relationship with an earlier voicing contrast for initials and its correlation with an earlier vowel length contrast. We see that these six tones can be categorized into three Kra-Dai tone categories, i.e., A, BC, and D. To put it another way, contemporary Ong-Be does not distinguish Tones B and C. Hence the distinction cannot be reconstructed to the Proto-Ong-Be level. A synopsis of the correspondences is presented in Table 55.

**Table 55: Ong-Be tone categories in a Kra-Dai perspective**

Tone Category	Chinese gloss	English gloss	Changliu	Qiaotou	Xinying
Kra-Dai Tone A	魚	'fish'	ba <sup>1</sup>	ba <sup>1</sup>	ba <sup>1</sup>
	水田	'paddy field'	nia <sup>2</sup>	nia <sup>2</sup>	nia <sup>2</sup>
Kra-Dai Tone B	吠	'to bark'	saw <sup>3</sup>	saw <sup>3</sup>	saw <sup>3</sup>
	吹	'to blow'	bew <sup>4</sup>	vow <sup>4</sup>	vow <sup>4</sup>
Kra-Dai Tone C	臉	'face'	na <sup>3</sup>	na <sup>3</sup>	na <sup>3</sup>
	水	'water'	nam <sup>4</sup>	nam <sup>4</sup>	nam <sup>4</sup>
Kra-Dai Tone D	翅膀	'wing'	bik <sup>7</sup>	bik <sup>7</sup>	bik <sup>7</sup>
	刀子	'knife'	mit <sup>8</sup>	mit <sup>8</sup>	mit <sup>8</sup>

In general, Ong-Be varieties spoken around Haikou have more tones than those spoken in Lingao County. Liang & Zhang (1997:24) proposed that the discrepancies in the number of tones was due to tonal splits conditioned by a vowel length contrast, where they mentioned that /e/ in Longtang often corresponds to rhymes with short vowels in Zhuang. By contrast, /a/ in Longtang corresponds to rhymes with /a/ and /aa/ in Zhuang. In the sections below, I demonstrate that actually such a tonal split is triggered by the vowel length *at the time of the split*, not necessarily reconstructible to the proto level.



As discussed in detail in Chapter 2, four proto tone categories,<sup>62</sup> conditioned by the voicing of initials at the time of the tonal split, can further be split into two subcategories, i.e., series 1 and series 2. These two subcategories can be seen in modern Ong-Be. Table 56 presents three minimal pairs with each pair differing only in tones.

**Table 56: Tonal series 1 and series 2 reflective of differences in initial consonants**

Chinese	English	CL (長流)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Tone Category	Sister Languages
曬	'to sun-dry'	ɗak <sup>55</sup>	ɗak <sup>13</sup>	ɗak <sup>33</sup>	ɗak <sup>53</sup>	ɗak <sup>55</sup>	D1	Proto-Tai *p.r-
繩索	'rope'	ɗak <sup>21</sup>	ɗak <sup>21</sup>	ɗak <sup>55</sup>	ɗak <sup>31</sup>	ɗak <sup>33</sup>	D2	Proto-Tai *ɟ
藥	'medicine'	zia <sup>35</sup>	zia <sup>44</sup>	zia <sup>(2)13</sup>	zia <sup>213</sup>	zia <sup>213</sup>	A1	Proto-Tai *ʔj-
椰子	'coconut'	zia <sup>24</sup>	zia <sup>33</sup>	zia <sup>(3)24</sup>	zia <sup>53</sup>	zia <sup>55</sup>	A2	--
村	'village'	bɛ <sup>33</sup>	vɔ <sup>24</sup>	vɔ <sup>33</sup>	vɔ <sup>31</sup>	vɔ <sup>33</sup>	BC1	Proto-Hlai *b-
細糠	'rice bran; chaff'	bɛ <sup>21</sup>	vɔ <sup>21</sup>	vɔ <sup>55</sup>	vɔ <sup>21</sup>	vɔ <sup>21</sup>	BC2	--

For instance, 'to sun-dry' and 'rope' both have the form /ɗak/. However, all the selected Ong-Be varieties employ one tonal correspondence set (55:13:33:53:55) for 'to sun-dry' and another set (21:21:55:31:33) for 'rope', indicating that different tone categories, namely D1 and D2, must be assigned to these two lexical items. Considering that tonal split can be caused by a voicing contrast but that none of the Ong-Be varieties preserves such a contrast, we must refer to evidence from outside of Ong-Be in its sister languages where such a voicing distinction can be reconstructed (Proto-Tai) or is still maintained (Proto-Hlai) to determine whether 'to sun-dry' belongs to series 1 or not. In other words, in the comparative method, two tone categories must be reconstructed; with access to information outside of Ong-Be in its sister languages, these two tone categories can be associated with an early voicing contrast, series 1 and series 2, in pre-Proto-Ong-Be.

<sup>62</sup> The prefix "proto" here is used to refer to the first phonemic tones in the history of Kra-Dai languages, resulting in four tone categories (Tones A, B, C, and D). It does not imply that Proto-Kra-Dai was tonal.

Tone categories A1, A2, BC1, BC2, D1, and D2, where 1 and 2 imply an earlier voicing contrast associated with initials at the time of the split, are employed here to mark Ong-Be tones. These categories correspond to 1, 2, 3, 4, 7, and 8 respectively in the numeric system. This study employs two systems in describing tones, namely the letter system used in F. Li (1977) to facilitate a comparison with other Kra-Dai languages, and the numeric system used in Liang & Zhang (1997) which follows the common practice employed in China where the Ong-Be languages are spoken; also see Zhang et al. (1985), Hansell (1988), Liang & Zhang (1997), and Ostapirat (1999, 2000) for the correspondence between Ong-Be tones and those of the other Kra-Dai languages.

In addition to an early voicing contrast in initials, it is not uncommon for Kra-Dai tones, especially Tone D, to further split along the lines of a vowel length distinction at the time of the split. Such a phenomenon is also attested in certain Ong-Be varieties. However, in the case of Ong-Be, these tonal splits are a later development and are not reconstructible to Proto-Ong-Be. The tonal splits in Ong-Be show a restricted geographical distribution, namely found in Longtang (龍塘), Longquan (龍泉), Longqiao (龍橋), Yongxing (永興), and Shishan (石山), all of which are in Haikou (海口). By contrast, Changliu, which is mutually intelligible and geographically close to these Ong-Be varieties, does not show any tonal split. In the following paragraphs, I explain how tone splits took place in Longtang and Yongxing, and why it is best to assume that these splits reflect the vowel length distinction at the time of the split.

Two minimal pairs distinguished by vowel length are given in Table 57, where the first member within each group contains \*-a:- and the second contains \*-a-. We see that in the western subgroup, the proto vowel length distinction has been neutralized. For

example, Qiaotou (橋頭), Huangtong (皇桐), and Xinying (新盈) have the same tonal and segmental reflexes within each pair: (1) ‘cockroach’ versus ‘to sleep’, and (2) ‘fruit’ versus ‘deaf’.

**Table 57: Vowel length and tonal split (shaded areas indicate tonal splits)**

English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be	Tone Category
‘cockroach’	-lap <sup>55</sup>	-lap <sup>21</sup>	-zap <sup>13</sup>	-zap <sup>33</sup>	-lap <sup>53</sup>	-lap <sup>55</sup>	*la:p	D1
‘to sleep’	lap <sup>55</sup>	lap <sup>55</sup>	lap <sup>44</sup>	lap <sup>33</sup>	lap <sup>53</sup>	lap <sup>55</sup>	*lap	D1
‘fruit’	mak <sup>21</sup>	mak <sup>33</sup>	mak <sup>21</sup>	mak <sup>55</sup>	mak <sup>31</sup>	mak <sup>33</sup>	*ma:k	D2
‘deaf’	mak <sup>21</sup>	mak <sup>33</sup>	mek <sup>33</sup>	mak <sup>55</sup>	mak <sup>31</sup>	mak <sup>33</sup>	*mak	D2

On the other hand, the early vowel length distinction has distinct reflexes in the eastern subgroup reflected in the different vowel qualities, as in Changliu, (長流) which reflects \*-a- as -a- in ‘to sleep’ and ‘deaf’, but \*-a:- as -a- in ‘cockroach’ and ‘fruit’, with no tonal difference. Some eastern Ong-Be varieties reflect an earlier vowel length distinction also by differences in suprasegmental features. Longtang (龍塘) frequently reflects \*-a:- as -a- but \*-a- as either -a- or -e-. It also employs two different tones (13 versus 44 in D1, and 21 versus 33 in D2) in the afore-mentioned minimal pairs; this shows that a tonal split took place when Longtang still had a vowel length contrast which has since been lost. Yongxing (永興) has the same vowel for both pairs, but uses different tone shapes (21 for ‘cockroach’ versus 55 for ‘to sleep’). Based on vowel length, Yongxing shows a tonal split in Tone D1, but not D2.

Tonal splits in Yongxing and Longtang are marked with a prime in the numeric tone system, resulting in 7, 7', 8, and 8' for ease of comparison with varieties that show no tonal splits. The prime indicates a short vowel at the time of the tonal split, not necessarily reconstructible to Proto-Ong-Be.

Such a tonal split is also attested in Tone A1 in Longtang. In Longtang, the first three lexical items in Table 58 have (2)13 as their tone, and the last three items have 44. However, no other Ong-Be variety shows such a split. Within the Kra-Dai language family, it is rare for a tonal split in non-checked syllables to be triggered by a vowel length distinction. Liang & Zhang (1997:26-27) proposed that this tonal split is triggered by the split of Tone 7 (13) and Tone 7' (44), which share the same pitch curves with Tone 1 and Tone 1', respectively.<sup>63</sup>

**Table 58: Longtang Tone 1 split**

English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be	Tone Category
'to lift'	ham <sup>35</sup>	ham <sup>213</sup>	ham <sup>(2)13</sup>	ham <sup>21(3)</sup>	ham <sup>213</sup>	ham <sup>213</sup>	*ha:m	A1
'grandchild'	lan <sup>35</sup>	lan <sup>213</sup>	lan <sup>(2)13</sup>	lan <sup>21(3)</sup>	lan <sup>213</sup>	lan <sup>213</sup>	*la:n	A1
'sand'	taŋ <sup>35</sup>	taŋ <sup>213</sup>	taŋ <sup>(2)13</sup>	taŋ <sup>21(3)</sup>	taŋ <sup>213</sup>	taŋ <sup>213</sup>	*ta:ŋ	A1
'black'	zam <sup>35</sup>	zam <sup>213</sup>	zem <sup>44</sup>	zam <sup>21(3)</sup>	zam <sup>213</sup>	lam <sup>213</sup>	*zam	A1
'ditch'	maŋ <sup>35</sup>	maŋ <sup>213</sup>	meŋ <sup>44</sup>	maŋ <sup>21(3)</sup>	maŋ <sup>213</sup>	maŋ <sup>213</sup>	*maŋ	A1
'skin'	naŋ <sup>35</sup>	naŋ <sup>213</sup>	neŋ <sup>44</sup>	naŋ <sup>21(3)</sup>	naŋ <sup>213</sup>	naŋ <sup>213</sup>	*naŋ	A1

Initially, the tonal split seems to reflect the length distinction of proto vowels.

Nevertheless, having a split tone does not guarantee that such a quantity distinction is reconstructible to Proto-Ong-Be. In fact, such a split only reflects the vowel length at the time the split occurred. Two sets of vowel correspondences are presented in Table 59, with *i:i:i:i:i* for the first three and *a~ɔ:a~ɔ:a~ɔ:ə:i:i* for the last two. A proto long vowel \*-i:- is accordingly reconstructed for 'cold', 'to hit', and 'knife', and a proto short vowel \*-i- is reconstructed for 'star' and 'mushroom' (see §6.2.2 for the reconstruction of Proto-Ong-Be high vowels). However, 'to hit' and 'knife' show a tonal split in Longtang and Yongxing (at least for 'to hit') when a proto long vowel is reconstructed. We can only

<sup>63</sup> The full citation form for Longtang Tone 1 is 213, although such a tone shape is rarely fully articulated. Tone 1 is frequently realized as 13, especially in connected speech.

postulate that at the time the tonal split took place, the proto vowel had already lost its length in ‘to hit’ and ‘knife’, rendering it a short vowel.

**Table 59: Proto-Ong-Be \*-i:t versus \*-it**

English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto-Ong-Be	Tone Category
‘cold’	nit <sup>7</sup>	nit <sup>7</sup>	nit <sup>7</sup>	nit <sup>7</sup>	nit <sup>7</sup>	nit <sup>7</sup>	*ni:t	D1
‘to hit’	kit <sup>7</sup>	kit <sup>7</sup>	kit <sup>7</sup>	kit <sup>7</sup>	kit <sup>7</sup>	kit <sup>7</sup>	*ki:t	D1
‘knife’	mit <sup>8</sup>	mit <sup>8</sup>	mit <sup>8</sup>	mit <sup>8</sup>	mit <sup>8</sup>	mit <sup>8</sup>	*mi:t	D2
‘star; eggplant; hail’	-hat <sup>7</sup>	-hat <sup>7</sup>	-k <sup>h</sup> ot <sup>7</sup>	-hət <sup>7</sup> ‘eggplant’	-hit <sup>7</sup> ‘hail’	-hit <sup>7</sup> ‘hail’	*hit	D1
‘mushroom’	lot <sup>8</sup> ; hot <sup>8</sup> (XIN)	hot <sup>8</sup>	hat <sup>8</sup>	hət <sup>8</sup>	hit <sup>8</sup>	hit <sup>8</sup>	*hit	D2

Table 60 and Table 61 present another scenario where proto short vowels are reconstructible, given the regular correspondences. We see that a tonal split did not take place as expected in ‘to step on’ and ‘heavy’ in Longtang (and in Yongxing for ‘to step on’), suggesting that the tonal split should not be taken into consideration when reconstructing the quantity of Proto-Ong-Be vowels (see Chapter 6 for more detail on the reconstruction). Instead, it only provides a clue as to what the vowel length may have been like at the time of the split.

**Table 60: Proto-Ong-Be \*-ək**

English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto-Ong-Be	Tone Category
‘to step on’	dək <sup>7</sup>	dək <sup>7</sup>	dək <sup>7</sup>	dək <sup>7</sup>	--	--	*dək	D1
‘expensive’	k <sup>h</sup> ək <sup>8</sup>	k <sup>h</sup> ək <sup>8</sup>	k <sup>h</sup> ək <sup>8</sup>	k <sup>h</sup> ək <sup>8</sup>	xək <sup>8</sup>	k <sup>h</sup> ək <sup>8</sup>	*k <sup>h</sup> ək	D2
‘to steal’	zək <sup>8</sup>	zək <sup>8</sup>	zək <sup>8</sup>	zək <sup>8</sup>	lək <sup>8</sup>	lək <sup>8</sup>	*zək	D2

**Table 61: Proto-Ong-Be \*-ən**

English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto-Ong-Be	Tone Category
‘heavy’	k <sup>h</sup> en <sup>1</sup>	k <sup>h</sup> ən <sup>1</sup>	k <sup>h</sup> ən <sup>1</sup>	xon <sup>1</sup>	xən <sup>1</sup>	k <sup>h</sup> ən <sup>1</sup>	*k <sup>h</sup> ən	A1
‘seed’	ben <sup>2</sup>	vən <sup>2</sup>	vən <sup>2</sup>	von <sup>2</sup>	vən <sup>2</sup>	vən <sup>2</sup>	*vən	A2
‘maggot’	ten <sup>3</sup>	tən <sup>3</sup>	tən <sup>3</sup>	ton <sup>3</sup>	tən <sup>3</sup>	tən <sup>3</sup>	*tən	BC1
‘sweat’	hen <sup>4</sup>	hən <sup>4</sup>	hən <sup>4</sup>	hon <sup>4</sup>	hən <sup>4</sup>	hən <sup>4</sup>	*hən	BC2

## 4.2. Ong-Be internal subgrouping

This section presents concrete evidence regarding the internal subgroups of Ong-Be. Zhang et al. (1985:13) classified Ong-Be into three groups/*tuyü*: Lingao, Chengmai, and Qiongsan. The varieties spoken in Lingao, western Chengmai, and Danzhou belong to the Lingao group. Their Chengmai group is confined to the Ong-Be varieties spoken in eastern Chengmai, such as Laocheng 老城, Bailian 白蓮, Macun 馬村, etc. Their Qiongsan group refers to the varieties spoken in Haikou and Qiongsan. Zhang et al. also state that the Ong-Be varieties spoken in Chengmai County, located between Haikou and Lingao, show linguistic traits found in the other two groups.

Liang & Zhang (1997), on the other hand, divided Ong-Be into two groups/*tuyü*: LinCheng 臨澄<sup>64</sup> and Qiongsan. Liang & Zhang's LinCheng group includes the varieties spoken in Lingao County, Danzhou City, and Chengmai County.<sup>65</sup> Their Qiongsan group covers the same region as that proposed by Zhang et al. (1985). However, none of the aforementioned classifications are based on shared innovation(s), which is the only valid criterion for linguistic subgrouping. Xin (2006) used the term 'eastern group' and 'western group' without specifying his classification criteria, nor the exact regions these two groups include. In short, none of these earlier divisions can be regarded as valid subgroupings.

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<sup>64</sup> Here I use LinCheng 臨澄 instead of Lincheng to avoid confusion between the acronym of two county names (*Lingao* 臨高 and *Chengmai* 澄邁) and the county seat of Lingao County which is 臨城 Lincheng. The original texts are given below followed by my translation.

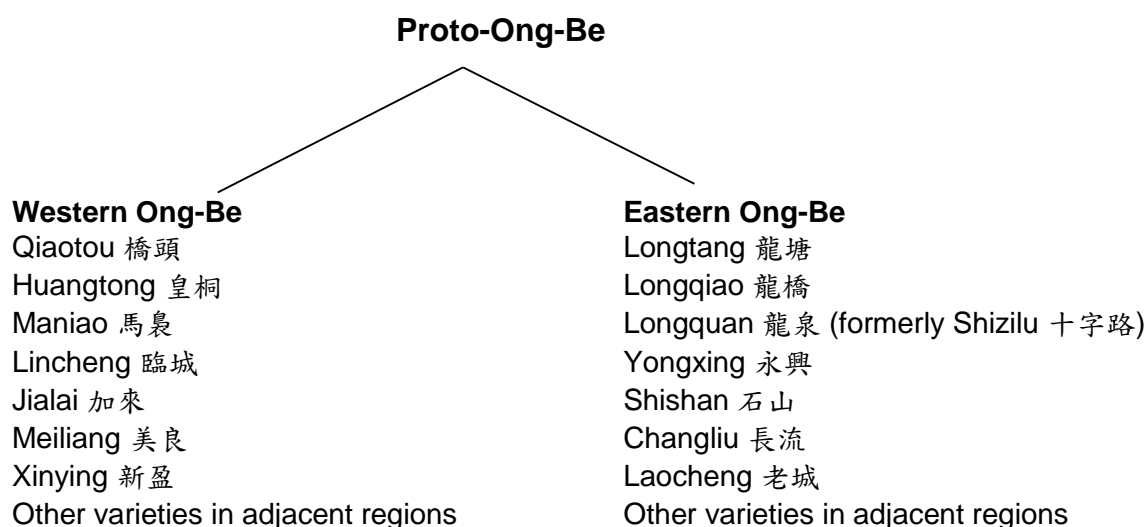
「... 我們把臨城話跟澄邁話作為一個土語，稱之為臨澄土語，而把瓊山話作為另一個土語，就叫做瓊山土語。」

(We consider *Linchenghua* and *Chengmaihua* as a *tuyü*, and name it *LinCheng tuyü*. *Qiongsanhua* is classified as another *tuyü* called Qiongsan *tuyü*.)

<sup>65</sup> They mentioned that the phonology of Bailian 白蓮 in Chengmai is identical to that of Lingao.

I propose that Ong-Be can be divided into two subgroups: Eastern Ong-Be and Western Ong-Be, which matches their geographical distribution (see Figure 2). That is, the varieties belonging to Eastern Ong-Be are those spoken in Haikou and nearby areas in northeastern Chengmai (such as Laocheng and Bailian), while Western Ong-Be refers to the varieties spoken in Lingao County, northwestern Chengmai (Fushan Town and Qiaotou Town), and the Ong-Be speaking regions in Danzhou adjacent to Lingao.

**Figure 2: Proto-Ong-Be subgrouping**



Contemporary Ong-Be varieties are subgrouped according to the following shared innovations - (1) the reflexes of \*-ip, \*-it, and \*-in, (2) the reflexes of \*-um and \*-un, and (3) irregular correspondences found in certain lexical items.

The vowel reflexes given in Table 62 show that while the first three Ong-Be varieties employ a lowvowel for \*-ip, \*-it, and \*-in, the last three varieties (the shaded parts) use a non-low vowel.

**Table 62: Proto-Ong-Be \*-ip, \*-it, and \*-in**

Chinese Gloss	生	香菇、蕈類	牙齒
English Gloss	‘raw’	‘mushroom’	‘tooth’
Proto-Ong-Be	*-ip	*-it	*-in
Longtang	zɔp <sup>7</sup>	hat <sup>8</sup>	tɛn <sup>1</sup>
Changliu	zɔp <sup>7</sup>	lot <sup>8</sup>	tɔn <sup>1</sup>
Laocheng <sup>66</sup>	zɔp <sup>7</sup>	hot <sup>8</sup>	tɔn <sup>1</sup>
Qiaotou	zəp <sup>7</sup>	hət <sup>8</sup>	tɛn <sup>1</sup>
Huangtong	zip <sup>7</sup>	hit <sup>8</sup>	tin <sup>1</sup>
Xinying	lip <sup>7</sup>	hit <sup>8</sup>	tin <sup>1</sup>

A parallel development is observed in Table 63 where Eastern Ong-Be, including Longtang, Changliu, and Laocheng, have low back vowels as the vowel reflexes of \*-um and \*-un. Western Ong-Be (Qiaotou, Huangtong, and Xinying) reflect \*-um and \*-un via -u-, keeping the quality of the proto vowel intact.

**Table 63: Proto-Ong-Be \*-um and \*-un**

Chinese Gloss	蛋	螃蟹	雨	樹
English Gloss	‘egg’	‘crab’	‘rain’	‘tree’
Proto-Ong-Be	*-um	*-um	*-un	*-un
Longtang	nɛm <sup>1</sup>	k <sup>h</sup> ɔm <sup>2</sup>	p <sup>h</sup> ɛn <sup>1</sup>	dɔn <sup>3</sup>
Changliu	nɔm <sup>1</sup>	k <sup>h</sup> ɔm <sup>2</sup>	p <sup>h</sup> an <sup>1</sup>	dɔn <sup>3</sup>
Laocheng	nɔm <sup>1</sup>	xɔm <sup>2</sup>	p <sup>h</sup> ɔn <sup>1</sup>	dɔn <sup>3</sup>
Qiaotou	num <sup>1</sup>	xum <sup>2</sup>	fun <sup>1</sup>	dun <sup>3</sup>
Huangtong	ɲum <sup>1</sup>	xum <sup>2</sup>	fun <sup>1</sup>	dun <sup>3</sup>
Xinying	zum <sup>1</sup>	k <sup>h</sup> um <sup>2</sup>	p <sup>h</sup> un <sup>1</sup>	dun <sup>3</sup>

Shared innovations are also attested in a few lexical items where two subgroups behave differently. For example, in Table 64, there are two tonal reflexes for ‘to laugh’, with one subgroup having Tone A2 (= Tone 2) and the other having Tone A1 (= Tone 1). The same patterns are found in ‘cat’ and ‘foxtail millet’ as well, in which the first three varieties have Tone A1 (= Tone 1) and BC2 (= Tone 4) respectively, in contrast with Tone A2 (= Tone 2) and Tone BC1 (= Tone 3) found in the last three varieties.

<sup>66</sup> In this study, the Laocheng (老城) data are from Zhang et al. (1985).



**Table 64: Irregular tonal correspondences (voicing alternation)**

Chinese Gloss	笑	貓	小米
English Gloss	‘to laugh’	‘cat’	‘foxtail millet’
Longtang	ziaw <sup>2</sup>	mew <sup>1</sup>	van <sup>4</sup>
Changliu	ziaw <sup>2</sup>	miw <sup>1</sup>	ban <sup>4</sup>
Laocheng	ziaw <sup>2</sup>	--	--
Qiaotou	ziaw <sup>1</sup>	mɛw <sup>2</sup>	fan <sup>3</sup>
Huangtong	ziaw <sup>1</sup>	mɛw <sup>2</sup>	fan <sup>3</sup>
Xinying	liaw <sup>1</sup>	mɛw <sup>2</sup>	p <sup>h</sup> an <sup>3</sup>

Furthermore, Table 65 presents irregularities that group Longtang, Changliu, and Laocheng together, as opposed to Qiaotou, Huangtong and Xinying, which form their own group. For ‘porridge’, it shows a  $t:t:t:f:p^h$  correspondence, in which the eastern Ong-Be varieties share  $t$ - (>  $*t^2$ -) as their initial, compared to  $*p^{h2}$ - in Western Ong-Be. As for ‘ear of rice’, the western Ong-Be varieties show a sporadic change where  $*-ŋ$  has become  $-n$ , which is not attested in Eastern Ong-Be. Regarding ‘human’, Eastern Ong-Be reflects Proto-Kra-Dai medial  $*-k^w$ - as  $v^2$ -, while Western Ong-Be reflects this medial as  $h^2$ -.

At first glance, ‘to stand’ in Xinying seems to pattern with Eastern Ong-Be in having  $z$ - as an initial. However, this is because  $*ŋ$  is denasalized in Xinying, resulting in  $z$ -. The contrast between  $ŋ$ - and  $z$ - is retained in Diaolou (調樓) (including Meiliang 美良), which is spoken in the region adjacent to Xinying and is one of the few dialects in Lingao County that has phonemic aspiration. Hence, the unique correspondence of ‘to stand’ in having a nasal onset in Qiaotou, Huangtong, and Diaolou/Xinying, but a voiced fricative onset in Longtang, Changliu and Laocheng is in accordance with my proposed subgrouping.

**Table 65: Irregular segmental correspondence**

Chinese Gloss	稀飯	稻穗	人	站
English Gloss	‘porridge’	‘ear of rice/grain’	‘human’	‘to stand’
Longtang	nam <sup>4</sup> tia <sup>4</sup>	ziŋ <sup>1</sup>	vɔn <sup>2</sup>	zun <sup>1</sup>
Changliu	tia <sup>4</sup>	zəŋ <sup>1</sup>	ɓan <sup>2</sup>	zun <sup>1</sup>
Laocheng	tia <sup>4</sup>	zəŋ <sup>1</sup>	vɔn <sup>2</sup>	zun <sup>1</sup>
Qiaotou	nam <sup>4</sup> fia <sup>4</sup>	zən <sup>1</sup>	hun <sup>2</sup>	nun <sup>1</sup>
Huangtong	nam <sup>4</sup> fia <sup>4</sup>	lən <sup>1</sup>	hun <sup>2</sup>	ŋun <sup>1</sup>
Xinying	nam <sup>4</sup> p <sup>h</sup> ia <sup>4</sup>	lən <sup>1</sup>	hun <sup>2</sup>	zun <sup>1</sup>

A series of shared sound innovations which serves as the basis for Ong-Be internal subgrouping has been given in Table 62 - Table 65. Lexical innovations given in Table 66 also group Longtang, Changliu, and Laocheng together, and Qiaotou along with Huangtong and Xinying as another subgroup.

**Table 66: Lexical innovation**

Chinese Gloss	頭髮	我	門	骨頭
English Gloss	‘hair’	‘1sg’	‘door’	‘bone’
Longtang	-sew <sup>3</sup>	ze <sup>2</sup>	dəw <sup>2</sup>	zik <sup>7</sup>
Changliu	-so <sup>3</sup>	zia <sup>3</sup> -t	dɔw <sup>2</sup>	zək <sup>7</sup>
Laocheng	-sɔw <sup>3</sup>	za <sup>2</sup>	dɔw <sup>2</sup>	zək <sup>7</sup>
Qiaotou	fuj <sup>1</sup>	ha <sup>2</sup>	dən <sup>4</sup>	ʔuaʔ <sup>8</sup>
Huangtong	fuj <sup>1</sup>	haw <sup>2</sup>	dən <sup>4</sup>	ʔuaʔ <sup>8</sup>
Xinying	fuj <sup>1</sup>	haw <sup>2</sup>	dən <sup>4</sup>	ʔuaʔ <sup>8</sup>

To sum up, based on shared innovations, including sounds and lexical changes, the contemporary varieties can be divided into two subgroups: Eastern Ong-Be and Western Ong-Be. The tonal splits observed in some of the eastern Ong-Be varieties are a secondary development conditioned by the vowel length contrast at the time of the splits.

## Chapter 5. Proto-Ong-Be consonants

This chapter presents the reconstruction of Proto-Ong-Be onsets using the comparative method where recurrent sound change plays an extremely important role. A proto phoneme is only reconstructible if certain features are attested in contemporary Ong-Be varieties. In other words, when a feature is shared by today's Ong-Be varieties, it must be reconstructed to the proto level if no other explanation can be attributed to it other than inheritance from a common ancestor. Since all contemporary Ong-Be varieties have lost the earlier voicing contrast that conditioned the secondary tonal split attested in many Kra-Dai languages, a contrast in voicing cannot be reconstructed to Proto-Ong-Be.

In his reconstruction of Proto-Tai, F. Li (1977) faced the same dilemma, considering that the earlier voicing contrast had already been lost in a large number of Tai languages. He stated that "It is perhaps safe to assume that the Proto-Tai tones A, B, C, and D split into two series, those with a voiceless initial and those with a voiced initial ... It is not known exactly when the two series became phonemic, and it is conceivable that the dates may vary according to dialects." (pp. 25-26). However, Thai scripts developed in the 13<sup>th</sup> century preserved indications of the earlier voicing contrast, and several scholars have pointed out that Cao Bang retains a voicing contrast (see Haudricourt 1949, 1960, 1961; L-Thongkum 1997; Hoàng 1997; Pittayaporn 2009; among others). Thai scripts and Cao Bang data serve as convincing evidence for the reconstruction of Proto-Tai voicing associated with initials.

In order to reconstruct Proto-Ong-Be successfully, key varieties for comparison are selected with caution. Changliu, Longtang, Huangtong, and Xinying are selected as the foundation for the reconstruction because (1) Changliu and Longtang of the eastern subgroup have the most complex phoneme inventories among all the Ong-Be varieties, and (2) in the western subgroup, the Huangtong variety (as well as all the Ong-Be varieties of Lingao, except for Xinying) preserves the  $n\text{-}\eta$  distinction absent in the eastern subgroup, while Xinying preserves /p<sup>h</sup>/ and /k<sup>h</sup>/ which have been lenited to fricatives in most of the western Ong-Be varieties.

The order of the tone categories used in this chapter is adopted from Liang & Zhang (1997) in which they labeled tone following the proto tone categories mentioned in Table 67 below (also see Table 55 and Table 56).

**Table 67: The order of the tone categories**

The letter system	The numeric system	Pitch in LT	Pitch in YX	Pitch in CL	Pitch in QT	Pitch in HT	Pitch in XY
A1	1	(2)13	213	35	21(3)	213	213
	1'	44					
A2	2	33	44	24	(3)24	55~53	55
BC1	3	24	24	33	33	33~31	33
BC2	4	21	21	21	55	21	21
D1	7	13	21	55	33	33~31	33
	7'	44	55				
D2	8	21	33	21	55	55~53	55
	8'	33					

With respect to the reconstruction of tonal series conditioned by a voicing contrast at the time of the split, represented by the raised numerals <sup>1</sup> and <sup>2</sup> where the former is associated with voiceless initials and the latter with voiced ones, the Ong-Be information *alone* will not allow me to reconstruct two series of each phoneme presented in Table 68, although tones in Ong-Be do retain relevant information. And it will not be necessary to employ labels like Kra-Dai tone categories and tonal series when one does not look

beyond the Ong-Be level. However, for the ease of examining Ong-Be from a broader perspective, the tonal series associated with earlier voicing will be employed for Proto-Ong-Be, and Kra-Dai tone categories will be used in my reconstruction. Table 68 presents the inventory of initials reconstructed for Proto-Ong-Be.

**Table 68: Proto-Ong-Be initials**

	<b>bilabial</b>	<b>labiodental</b>	<b>alveolar</b>	<b>alveolopalatal</b>	<b>velar</b>	<b>glottal</b>
<b>stops</b>	*p <sup>h1</sup> *p <sup>h2</sup>		*t <sup>1</sup> *t <sup>2</sup>		*k <sup>1</sup> *k <sup>2</sup> *k <sup>h1</sup> *k <sup>h2</sup>	*ʔ <sup>1</sup>
<b>implosives</b>	*b <sup>1</sup> *b <sup>2</sup>		*d <sup>1</sup> *d <sup>2</sup>			
<b>nasals</b>	*m <sup>1</sup> *m <sup>2</sup>		*n <sup>1</sup> *n <sup>2</sup>	*ɲ <sup>1</sup> *ɲ <sup>2</sup>	*ŋ <sup>1</sup> *ŋ <sup>2</sup>	
<b>affricates</b>			*ts <sup>1</sup> *ts <sup>2</sup>			
<b>fricatives</b>		*v <sup>1</sup> *v <sup>2</sup>	*s <sup>1</sup> *s <sup>2</sup> *z <sup>1</sup> *z <sup>2</sup>	*ʃ <sup>1</sup> *ʃ <sup>2</sup>		*h <sup>1</sup> *h <sup>2</sup>
<b>laterals</b>			*l <sup>1</sup> *l <sup>2</sup>			

## 5.1. Proto initials

### 5.1.1. Proto stops

The words listed in Table 69 and Table 70 all begin with a bilabial implosive. Using the comparative method, I reconstruct *b*- for these two sets. Although these words agree at the segmental level, they differ in tones (tonal series 1 only coocur with odd-numbered tones, and series 2 with even-numbered tones). The loss of an early voicing contrast was compensated at the suprasegmental level via contrasts in the tones on following vowels. Such a suprasegmental contrast must be reconstructed alongside the segment *b*-, reflected as \*b<sup>1</sup>- and \*b<sup>2</sup>- in my proposed consonant inventory where 1 stands for an earlier voiceless initial and 2 for an earlier voiced initial at the time of the tonal split.

**Table 69:** <sup>67</sup> \*b<sup>1</sup>-

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		b-	b-	b-	b-	b-	b-
魚	'fish'	ba <sup>1</sup>	ba <sup>1</sup>	ba <sup>1</sup>	ba <sup>1</sup>	ba <sup>1</sup>	ba <sup>1</sup>
水蛭	'aquatic leech'	-biŋ <sup>1</sup>	-biŋ <sup>1</sup>	-biŋ <sup>1</sup>	biŋ <sup>1</sup>	biŋ <sup>1</sup>	biŋ <sup>1</sup>
乾淨	'clean'	baŋ <sup>3</sup>	baŋ <sup>3</sup>	--	baŋ <sup>3</sup>	baŋ <sup>3</sup>	baŋ <sup>3</sup>
血	'blood'	baŋ <sup>7</sup>	baŋ <sup>7</sup>	ba <sup>7</sup>	baŋ <sup>8</sup> -t	baŋ <sup>7</sup>	baŋ <sup>7</sup>
口、嘴	'mouth'	bak <sup>7</sup>	bak <sup>7</sup>	bak <sup>7</sup>	bak <sup>7</sup>	bak <sup>7</sup>	bak <sup>7</sup>

**Table 70:** \*b<sup>2</sup>-

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		b-	b-	b-	b-	b-	b-
泥	'mud'	boŋ <sup>2</sup>	boŋ <sup>2</sup> 'dust'	boŋ <sup>2</sup>	boŋ <sup>2</sup>	boŋ <sup>2</sup>	boŋ <sup>2</sup>
葉	'leaf'	be <sup>2</sup>	bo <sup>2</sup>	bo <sup>2</sup>	bo <sup>2</sup>	bo <sup>2</sup>	bo <sup>2</sup>
雲	'cloud'	ba <sup>4</sup>	ba <sup>4</sup>	ba <sup>4</sup>	ba <sup>4</sup>	ba <sup>4</sup>	ba <sup>4</sup>
中午	'midday'	bak <sup>8</sup>	bak <sup>8</sup>	bek <sup>8</sup>	bak <sup>8</sup>	--	bak <sup>8</sup>
	早飯 'breakfast'						

Table 71 and Table 72 consist of words that begin with an implosive d<sup>-</sup>. Based on the internal evidence from Ong-Be, \*d<sup>1</sup>- and \*d<sup>2</sup>- are chosen to reconstruct these two sets.

**Table 71:** \*d<sup>1</sup>-

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		d-	d-	d-	d-	d-	d-
眼	'eye'	da <sup>1</sup>	da <sup>1</sup>	da <sup>1</sup>	da <sup>1</sup>	da <sup>1</sup>	da <sup>1</sup>
死	'to die'	daj <sup>1</sup>	daj <sup>1</sup>	daj <sup>1</sup>	daj <sup>1</sup>	daj <sup>1</sup>	daj <sup>1</sup>
低	'low'	dom <sup>3</sup>	dom <sup>3</sup>	dom <sup>3</sup>	dom <sup>3</sup>	dom <sup>3</sup>	dom <sup>3</sup>
樹	'tree'	dɔn <sup>3</sup>	dɔn <sup>3</sup>	dɔn <sup>3</sup>	dun <sup>3</sup>	dun <sup>3</sup>	dun <sup>3</sup>
陸龜	'turtle'	--	--	dɔw <sup>3</sup>	dɔw <sup>3</sup>	dɔw <sup>3</sup>	dɔw <sup>3</sup>
曬	'to sun-dry'	dak <sup>7</sup>	dak <sup>7</sup>	dak <sup>7</sup>	dak <sup>7</sup>	dak <sup>7</sup>	dak <sup>7</sup>

<sup>67</sup> In this study, irregular tones are marked with -t, irregular vowels with -v, irregular initials with -i, and irregular finals with -f.

**Table 72: \*d<sup>2</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		d-	d-	d-	d-	d-	d-
虹	'rainbow'	dua <sup>j4</sup> -t, -v	daj <sup>2</sup>	daj <sup>2</sup>	daj <sup>2</sup>	daj <sup>2</sup>	daj <sup>2</sup>
石	'stone'	din <sup>2</sup>	din <sup>2</sup>	din <sup>2</sup>	din <sup>2</sup>	din <sup>2</sup>	din <sup>2</sup>
黃蜂	'wasp'	daw <sup>4</sup>	daw <sup>4</sup>	daw <sup>4</sup>	daw <sup>4</sup>	daw <sup>4</sup>	daw <sup>4</sup>
繩索	'rope'	dak <sup>8</sup>	dak <sup>8</sup>	dak <sup>8</sup>	dak <sup>8</sup>	dak <sup>8</sup>	dak <sup>8</sup>
織布機	'loom'	dɛk <sup>8</sup>	dɛk <sup>8</sup>	dɛk <sup>8</sup>	--	dɛk <sup>8</sup>	dɛk <sup>8</sup>

All varieties in Table 73 and Table 74 have *t*- with tones associated with an early voiceless initial in Table 73 and an early voiced initial in Table 74. Under the framework of the comparative method, \*t<sup>1</sup>- and \*t<sup>2</sup>- are the most ideal candidates for these two sets.

**Table 73: \*t<sup>1</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		t-	t-	t-	t-	t-	t-
鳴叫	'to crow'	tan <sup>1</sup>	tan <sup>1</sup>	tan <sup>1</sup>	tan <sup>1</sup>	tan <sup>1</sup>	tan <sup>1</sup>
魚鉤	'fish hook'	tin <sup>3</sup>	tin <sup>3</sup>	tin <sup>3</sup>	tin <sup>3</sup>	tin <sup>3</sup>	tin <sup>3</sup>
水牛	'water buffalo'	tej <sup>3</sup>	tej <sup>3</sup>	tej <sup>3</sup>	tej <sup>3</sup>	tej <sup>3</sup>	tej <sup>3</sup>
尾巴	'tail'	tuŋ <sup>7</sup>	tuŋ <sup>7</sup>	tuŋ <sup>7</sup>	tuŋ <sup>8</sup> -t	tuŋ <sup>7</sup>	tuŋ <sup>7</sup>
洗 (手)	'to wash (hands)'	tuk <sup>7</sup>	tuk <sup>7</sup>	tuk <sup>7</sup>	tuk <sup>7</sup>	tuk <sup>7</sup>	tuk <sup>7</sup>

**Table 74: \*t<sup>2</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		t-	t-	t-	t-	t-	t-
茅草	'thatch'	tia <sup>2</sup>	tia <sup>2</sup>	tia <sup>2</sup>	tia <sup>2</sup>	tia <sup>2</sup>	tia <sup>2</sup>
蓆衣	'straw cape'	tej <sup>4</sup>	tej <sup>4</sup>	tej <sup>4</sup>	tej <sup>4</sup>	tej <sup>4</sup>	tej <sup>4</sup>
背 (v.)	'to carry' (on back)	ta <sup>4</sup>	ta <sup>4</sup>	ta <sup>4</sup> ; ta <sup>1</sup>	ta <sup>4</sup>	ta <sup>4</sup>	--

Table 75 and Table 76 present a list of words beginning with *k*-. Based on the internal Ong-Be evidence \*k<sup>1</sup>- and \*k<sup>2</sup>- are reconstructed for these two tables. Although '3SG' in Changliu (長流) shows a tonal irregularity, it is not uncommon in tonal languages for function words and numerals to have unexpected tonal behaviors compared to content words.

**Table 75: \*k<sup>1</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		k-	k-	k-	k-	k-	k-
雞	‘chicken’	kaj <sup>1</sup>	kej <sup>1</sup>	kej <sup>1</sup>	kaj <sup>1</sup>	kaj <sup>1</sup>	kaj <sup>1</sup>
吃	‘to eat’	kɔn <sup>1</sup>	kɔn <sup>1</sup>	kɔn <sup>1</sup>	kɔn <sup>1</sup>	kɔn <sup>1</sup>	kɔn <sup>1</sup>
殺	‘to kill’	ka <sup>3</sup>	ka <sup>3</sup>	ka <sup>3</sup>	ka <sup>3</sup>	ka <sup>3</sup>	ka <sup>3</sup>
頭蟲	‘head louse’	kat <sup>7</sup>	kat <sup>7</sup>	kat <sup>7</sup>	kat <sup>7</sup>	kat <sup>7</sup>	kat <sup>7</sup>
腿、腳	‘leg; foot’	kok <sup>7</sup>	kok <sup>7</sup>	kok <sup>7</sup>	kuk <sup>7</sup>	kok <sup>7</sup>	kok <sup>7</sup>

**Table 76: \*k<sup>2</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		k-	k-	k-	k-	k-	k-
他	‘3SG’	kə <sup>4</sup> -t; kw <sup>4</sup> (XIN)	kə <sup>2</sup>	kə <sup>2</sup>	kə <sup>2</sup>	kə <sup>2</sup>	kə <sup>2</sup>
苦	‘bitter’	kam <sup>2</sup>	kam <sup>2</sup>	kam <sup>2</sup>	kam <sup>2</sup>	kam <sup>2</sup>	kam <sup>2</sup>
晚上	‘night’	kim <sup>4</sup>	kom <sup>4</sup>	kom <sup>4</sup>	--	kɔm <sup>4</sup>	kɔm <sup>4</sup>
屎	‘excrement’	kaj <sup>4</sup>	kaj <sup>4</sup>	kaj <sup>4</sup>	kaj <sup>4</sup>	kaj <sup>4</sup>	kaj <sup>4</sup>
綁	‘to tie’	kat <sup>8</sup>	kat <sup>8</sup>	kət <sup>8</sup>	kat <sup>8</sup>	kat <sup>8</sup>	kat <sup>8</sup>

The words given in Table 77 all begin with a glottal stop; hence \*ʔ<sup>1</sup>- is reconstructed for this set. Due to physiological constraints, it is impossible to reconstruct a voiced glottal stop, because to produce a glottal stop the glottis is closed, but to voice a consonant the glottis must be open. The tone of ‘crow’ /ʔa:k<sup>7</sup>/ which happens to be in series 2 must be due to a sporadic tone change because (1) it is not recurrent, and (2) that ‘crow’ in Proto-Kra and Proto-Hlai is \*ʔak<sup>D</sup> and \*ʔa:k<sup>D</sup> respectively (Ostapirat 2000; 2004), both pointing to a proto voiceless initial.

**Table 77: \*ʔ<sup>1</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		ʔ-	ʔ-	ʔ-	ʔ-	ʔ-	ʔ-
咳嗽	‘to cough’	ʔaj <sup>1</sup>	ʔaj <sup>1</sup>	ʔej <sup>1</sup> -	ʔaj <sup>1</sup>	ʔaj <sup>1</sup>	-ʔaj <sup>1</sup>
拿	‘to take’	ʔow <sup>1</sup>	ʔow <sup>1</sup>	ʔɔ <sup>1</sup>	ʔow <sup>1</sup>	ʔow <sup>1</sup>	--
甜、好吃	‘sweet; delicious’	ʔen <sup>3</sup>	ʔian <sup>3</sup>	ʔen <sup>3</sup>	ʔen <sup>3</sup>	ʔen <sup>3</sup>	ʔen <sup>3</sup>
賣	‘to sell’	ʔin <sup>3</sup>	ʔin <sup>3</sup>	ʔen <sup>3</sup>	ʔin <sup>3</sup>	ʔin <sup>3</sup>	ʔin <sup>3</sup>
粽子	‘zongzi’	ʔot <sup>7</sup>	ʔot <sup>7</sup>	ʔot <sup>7</sup>	ʔot <sup>7</sup>	ʔot <sup>7</sup>	ʔot <sup>7</sup>
胸膛	‘chest’	-ʔuak <sup>7</sup>	-ʔɔk <sup>7</sup>	-ʔɔk <sup>7</sup>	-ʔɔk <sup>7</sup>	-ʔɔk <sup>7</sup>	-ʔɔk <sup>7</sup>
烏鴉	‘crow’	-ʔak <sup>8</sup>	-ʔak <sup>8</sup>	-ʔak <sup>8</sup>	-ʔak <sup>8</sup>	-ʔak <sup>8</sup>	-ʔak <sup>8</sup>



Words in Table 78 and Table 79 show two modern reflexes *f*- and *p<sup>h</sup>*-. Based on the directionality of sound change, *\*p<sup>h</sup>*- is the candidate for the proto initial.

**Table 78: *\*p<sup>h</sup>*-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		<i>p<sup>h</sup></i>	<i>p<sup>h</sup></i>	<i>p<sup>h</sup></i> -	<i>f</i> -	<i>f</i> -	<i>p<sup>h</sup></i> -
天 <sup>68</sup>	‘sky’	<i>p<sup>h</sup>a</i> <sup>3</sup>	<i>p<sup>h</sup>a</i> <sup>3</sup>	<i>p<sup>h</sup>a</i> <sup>3</sup>	<i>fa</i> <sup>3</sup>	<i>fa</i> <sup>3</sup>	<i>p<sup>h</sup>a</i> <sup>3</sup>
雨	‘rain’	<i>p<sup>h</sup>an</i> <sup>1</sup>	<i>p<sup>h</sup>ɔn</i> <sup>1</sup>	<i>p<sup>h</sup>en</i> <sup>1</sup>	<i>fun</i> <sup>1</sup>	<i>fun</i> <sup>1</sup>	<i>p<sup>h</sup>un</i> <sup>1</sup>
頭髮	‘hair’	--	--	--	<i>fuj</i> <sup>1</sup>	<i>fuj</i> <sup>1</sup>	<i>p<sup>h</sup>uj</i> <sup>1</sup>

**Table 79: *\*p<sup>h</sup>*-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		<i>p<sup>h</sup></i>	<i>p<sup>h</sup></i>	<i>p<sup>h</sup></i> -	<i>f</i> -	<i>f</i> -	<i>p<sup>h</sup></i> -
扇子	‘fan’	<i>p<sup>h</sup>aj</i> <sup>2</sup>	<i>p<sup>h</sup>ɔj</i> <sup>2</sup>	<i>p<sup>h</sup>ɔj</i> <sup>2</sup>	<i>fəj</i> <sup>2</sup>	<i>fɔj</i> <sup>2</sup>	<i>p<sup>h</sup>ɔj</i> <sup>2</sup>
還	‘to return’	<i>p<sup>h</sup>e</i> <sup>4</sup>	<i>p<sup>h</sup>ɔ</i> <sup>4</sup>	<i>p<sup>h</sup>ɔ</i> <sup>4</sup>	<i>fo</i> <sup>4</sup>	<i>fɔ</i> <sup>4</sup>	<i>p<sup>h</sup>ɔ</i> <sup>4</sup>
掏	‘to take out’	<i>p<sup>h</sup>o</i> ʔ <sup>8</sup>	<i>p<sup>h</sup>ɛ</i> ʔ <sup>8</sup>	--	--	--	<i>p<sup>h</sup>ə</i> ʔ <sup>8</sup>

After reconstructing *\*k<sup>1</sup>*- and *\*k<sup>2</sup>*- in Table 75 and Table 76, we encounter other correspondences that are also velar, as presented in Table 80 and Table 81. I thus reconstruct *\*k<sup>h</sup>*<sup>1</sup>- and *\*k<sup>h</sup>*<sup>2</sup>- because the lenition of *k<sup>h</sup>*- > *x*- is a natural sound change attested worldwide. It is noteworthy that both corresponding sets contain limited tokens, unlike their stop counterparts *\*k<sup>1</sup>*- and *\*k<sup>2</sup>*-.

**Table 80: *\*k<sup>h</sup>*<sup>1</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		<i>k<sup>h</sup></i> -	<i>k<sup>h</sup></i> -	<i>k<sup>h</sup></i> -	<i>x</i> -	<i>x</i> -	<i>k<sup>h</sup></i> -
重	‘heavy’	<i>k<sup>h</sup>en</i> <sup>1</sup>	<i>k<sup>h</sup>ɔn</i> <sup>1</sup>	<i>k<sup>h</sup>ɔn</i> <sup>1</sup>	<i>xon</i> <sup>1</sup>	<i>xɔn</i> <sup>1</sup>	<i>k<sup>h</sup>ɔn</i> <sup>1</sup>
輕	‘light (not heavy)’	<i>k<sup>h</sup>e</i> <sup>3</sup>	<i>k<sup>h</sup>ɔ</i> <sup>3</sup>	<i>k<sup>h</sup>ɔ</i> <sup>3</sup>	<i>xo</i> <sup>3</sup>	<i>xɔ</i> <sup>3</sup>	<i>k<sup>h</sup>ɔ</i> <sup>3</sup>
癩蛤蟆	‘toad’	<i>-k<sup>h</sup>ok</i> <sup>7</sup>	<i>-k<sup>h</sup>ok</i> <sup>7</sup>	<i>-k<sup>h</sup>ok</i> <sup>7</sup>	--	<i>-xok</i> <sup>7</sup>	<i>-kxok</i> <sup>7</sup> (HM)

**Table 81: *\*k<sup>h</sup>*<sup>2</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		<i>k<sup>h</sup></i> -	<i>k<sup>h</sup></i> -	<i>k<sup>h</sup></i> -	<i>x</i> -	<i>x</i> -	<i>k<sup>h</sup></i> -
蟹	‘crab’	<i>k<sup>h</sup>ɔm</i> <sup>2</sup>	<i>k<sup>h</sup>ɔm</i> <sup>2</sup>	<i>k<sup>h</sup>ɔm</i> <sup>2</sup>	<i>xum</i> <sup>2</sup>	<i>xum</i> <sup>2</sup>	<i>k<sup>h</sup>um</i> <sup>2</sup>
半夜	‘midnight’	--	--	<i>ɗa</i> <sup>3</sup> <i>k<sup>h</sup>ən</i> <sup>2</sup>	<i>ɗa</i> <sup>3</sup> <i>xən</i> <sup>2</sup>	<i>ɗa</i> <sup>3</sup> <i>xən</i> <sup>2</sup>	<i>ɗa</i> <sup>3</sup> <i>k<sup>h</sup>ən</i> <sup>2</sup>
貴	‘expensive’	<i>k<sup>h</sup>ɔk</i> <sup>8</sup>	<i>k<sup>h</sup>ɔk</i> <sup>8</sup>	<i>k<sup>h</sup>ɔk</i> <sup>8</sup>	<i>xɔk</i> <sup>8</sup>	<i>xɔk</i> <sup>8</sup>	<i>k<sup>h</sup>ɔk</i> <sup>8</sup>

<sup>68</sup> Hansell (1988:247) points out that the word for ‘sky’ in Ong-Be corresponds to the word for ‘cloud’ in Tai.

### 5.1.2. Proto fricatives

Two modern reflexes *v-* and *ɸ-* are seen in different languages in Table 82 and Table 83. The phoneme *\*ɸ* has been assigned to Table 69 and Table 70 for another correspondence set. Considering the majority-wins principle (Campbell 2013:131-132), *v-* is a favored candidate. Parallel to what I have proposed for the initials for Table 69 and Table 70, two sets of initials, i.e., *\*v<sup>1</sup>-* and *\*v<sup>2</sup>-*, are reconstructed here for the sound correspondences represented in Table 82 and Table 83. It is noteworthy that Yongxing (永興) and Longtang (龍塘) show a split in having two reflexes *ɸ-* and *v-* where *v-* becomes *ɸ-* before *\*-i-*, and that *\*ɸ<sup>1</sup>-* and *\*ɸ<sup>2</sup>-*, and *\*v<sup>1</sup>-* and *\*v<sup>2</sup>-* have been merged in Changliu (長流).

**Table 82: *\*v<sup>1</sup>-***

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		<i>ɸ-</i>	<i>v-, ɸ-</i>	<i>v-, ɸ-</i>	<i>v-</i>	<i>v-</i>	<i>v-</i>
薄	'thin (not thick)'	<i>ɸian<sup>1</sup></i>	<i>ɸian<sup>1</sup></i>	<i>ɸian<sup>1</sup></i>	<i>vian<sup>1</sup></i>	<i>vian<sup>1</sup></i>	<i>vian<sup>1</sup></i>
飛	'to fly'	<i>ɸan<sup>1</sup></i>	<i>ɸon<sup>1</sup></i>	<i>ɸen<sup>1</sup></i>	<i>vin<sup>1</sup></i>	<i>vin<sup>1</sup></i>	<i>vin<sup>1</sup></i>
買	'to buy'	<i>ɸian<sup>1</sup></i>	<i>ɸien<sup>1</sup> [ɸien]</i>	<i>ɸien<sup>1</sup> [ɸen]</i>	<i>vien<sup>1</sup> [vien]</i>	<i>vian<sup>1</sup></i>	<i>vian<sup>1</sup></i>
旱地	'dry field'	--	--	<i>ɸin<sup>3</sup></i>	<i>vən<sup>3</sup></i>	<i>vən<sup>3</sup></i>	<i>vən<sup>3</sup></i>
肩膀	'shoulder'	<i>-ɸia<sup>3</sup></i>	<i>-ɸia<sup>3</sup></i>	<i>-ɸia<sup>3</sup></i>	<i>-via<sup>3</sup></i>	<i>-via<sup>3</sup></i>	<i>-via<sup>3</sup> 'arm'</i>
風	'wind'	<i>ɸan<sup>3</sup></i>	<i>van<sup>3</sup></i>	<i>van<sup>3</sup></i>	<i>van<sup>3</sup></i>	<i>van<sup>3</sup></i>	<i>van<sup>3</sup></i>
村	'village'	<i>ɸe<sup>3</sup></i>	<i>vɔ<sup>3</sup></i>	<i>vɔ<sup>3</sup></i>	<i>vɔ<sup>3</sup></i>	<i>vɔ<sup>3</sup></i>	<i>vɔ<sup>3</sup></i>

**Table 83: *\*v<sup>2</sup>-***

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		<i>ɸ-</i>	<i>v-</i>	<i>v-</i>	<i>v-</i>	<i>v-</i>	<i>v-</i>
大腿	'thigh'	<i>-ɸa<sup>2</sup></i>	<i>-va<sup>2</sup></i>	<i>-va<sup>2</sup></i>	<i>-va<sup>2</sup></i>	<i>-va<sup>2</sup></i>	<i>-va<sup>2</sup></i>
細糠	'rice bran'	<i>ɸe<sup>4</sup></i>	<i>vɔ<sup>4</sup></i>	<i>vɔ<sup>4</sup></i>	<i>vɔ<sup>4</sup></i>	<i>vɔ<sup>4</sup></i>	<i>vɔ<sup>4</sup></i>
太陽、 白天	'sun; day'	<i>ɸan<sup>2</sup></i>	<i>vən<sup>2</sup></i>	<i>vən<sup>2</sup></i>	<i>vən<sup>2</sup></i>	<i>vən<sup>2</sup></i>	<i>vən<sup>2</sup></i>
火	'fire'	<i>ɸej<sup>2</sup></i>	<i>vɛj<sup>2</sup></i>	<i>vɛj<sup>2</sup></i>	<i>vɛj<sup>2</sup></i>	<i>vɛj<sup>2</sup></i>	<i>vɛj<sup>2</sup></i>
柴	'firewood'	<i>ɸən<sup>2</sup></i>	<i>vən<sup>2</sup></i>	<i>vən<sup>2</sup></i>	<i>vən<sup>2</sup></i>	<i>vən<sup>2</sup></i>	<i>vən<sup>2</sup></i>
蒼蠅	'fly'	<i>-maŋ<sup>4</sup> -i</i>	<i>-vaŋ<sup>4</sup></i>	<i>-vaŋ<sup>4</sup></i>	<i>-vaŋ<sup>4</sup></i>	<i>-vaŋ<sup>4</sup></i>	<i>-vaŋ<sup>4</sup></i>
吹	'to blow'	<i>ɸew<sup>4</sup></i>	<i>vɔw<sup>4</sup></i>	<i>vɔw<sup>4</sup></i>	<i>vɔw<sup>4</sup></i>	<i>vɔw<sup>4</sup></i>	<i>vɔw<sup>4</sup></i>

\*s<sup>1</sup>-, which has not been reconstructed yet, is best reserved for Table 84 because all the modern reflexes are realized as s-. The only example that shows a different series of initial consonants is the word for ‘chopsticks’ (from 箸; Middle Chinese:<sup>69</sup> \*ʃio) which is a Chinese loan (Table 85). Consequently, \*s<sup>2</sup>- is not reconstructed for (1) since it does not have a recurrent sound correspondence, and (2) it is found only in an (early) loanword. The reason \*s<sup>2</sup>- is missing will be discussed in section 5.3.1. It is noteworthy that the Ong-Be varieties surveyed in this paper have s-, which corresponds to an affricate ts- in *Jizhao Haihua*, cf. *tsiom*<sup>31</sup> ‘skinny’, *tsiai*<sup>31</sup> ‘moon’, and *ts’y*<sup>33</sup> ‘chopsticks’ (Ostapirat 1998).

**Table 84: \*s<sup>1</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		s-	s-	s-	s-	s-	s-
月亮	‘moon’	sqj <sup>1</sup>	saj <sup>1</sup>	sej <sup>1</sup>	saj <sup>1</sup>	saj <sup>1</sup>	saj <sup>1</sup>
耳朵	‘ear’	sa <sup>1</sup>	sa <sup>1</sup>	sa <sup>1</sup>	sa <sup>1</sup>	sa <sup>1</sup>	sa <sup>1</sup>
蜜蜂	‘bee’	saŋ <sup>3</sup>	saŋ <sup>3</sup>	saŋ <sup>3</sup>	saŋ <sup>3</sup>	saŋ <sup>3</sup>	saŋ <sup>3</sup>
漁網	‘fishnet’	sqj <sup>3</sup>	saj <sup>3</sup>	saj <sup>3</sup>	saj <sup>3</sup>	saj <sup>3</sup>	saj <sup>3</sup>
蔬菜	‘vegetable’	sak <sup>7</sup>	sak <sup>7</sup>	sak <sup>7</sup>	sak <sup>7</sup>	sak <sup>7</sup>	sak <sup>7</sup>
芋頭	‘taro’	sak <sup>7</sup>	sak <sup>7</sup>	-sak <sup>7</sup>	-sak <sup>7</sup>	-sak <sup>7</sup>	-sak <sup>7</sup>

**Table 85: s<sup>2</sup>- (Chinese loan)**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		s-	s-	s-	s-	s-	s-
筷子	‘chopsticks’	so <sup>4</sup>	səw <sup>4</sup>	sə <sup>4</sup>	səw <sup>4</sup>	səw <sup>4</sup>	səw <sup>4</sup>

Two reflexes ʒ- and z- are observed in Table 86 and Table 87. Cognate sets listed in both tables show an identical sound correspondence, except for their tonal series, derived from an early voicing contrast associated with initials. Considering the place of articulation, where one is alveolar and the other palatal, I propose that \*ʒ<sup>1</sup>- and \*ʒ<sup>2</sup> should be reconstructed as the initials for Table 86 and Table 87, respectively, because

<sup>69</sup> Middle Chinese cited in this study is based on Wang Li’s (王力) reconstruction from *Corpus of Old Chinese, Middle Chinese and Modern Chinese* (漢字古今音資料庫) (<http://xiaoxue.iis.sinica.edu.tw/ccr/>).

\*z is better reserved for the corresponding sets in Table 88 and Table 89 where a majority of reflexes are alveolar.

**Table 86: \*ʐ<sup>1</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		z-	z-	z-	ʐ-	ʐ-	ʐ-
老虎	'tiger'	zua <sup>1</sup>	zua <sup>1</sup>	zua <sup>1</sup>	zua <sup>1</sup>	ʐua <sup>1</sup> 'lion' (LC)	--
井	'well'	zan <sup>1</sup>	zan <sup>1</sup>	zen <sup>1</sup>	ʐan <sup>1</sup>	ʐan <sup>1</sup>	ʐan <sup>1</sup>
藥	'medicine'	zia <sup>1</sup>	zia <sup>1</sup>	zia <sup>1</sup>	ʐia <sup>1</sup>	ʐia <sup>1</sup>	ʐia <sup>1</sup>
酒	'liquor'	zan <sup>3</sup>	zan <sup>3</sup>	zan <sup>3</sup>	ʐan <sup>3</sup>	ʐan <sup>3</sup>	ʐan <sup>3</sup>
衣服	'clothes'	-zua <sup>3</sup>	zua <sup>3</sup>	-zua <sup>3</sup>	ʐua <sup>3</sup>	-ʐua <sup>3</sup>	-ʐua <sup>3</sup>
餓	'hungry'	zak <sup>7</sup>	zak <sup>7</sup>	zak <sup>7</sup>	ʐiak <sup>7</sup>	ʐiak <sup>7</sup>	ʐiak <sup>7</sup>

**Table 87: \*ʐ<sup>2</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		z-	z-	z-	ʐ-	ʐ-	ʐ-
椰子	'coconut'	-zia <sup>2</sup>	-zia <sup>2</sup>	-zia <sup>2</sup>	-ʐia <sup>2</sup>	-ʐia <sup>2</sup>	-ʐia <sup>2</sup>
油	'oil'	zɔw <sup>2</sup>	zəw <sup>2</sup>	zəw <sup>2</sup>	ʐəw <sup>2</sup>	ʐu <sup>2</sup>	ʐu <sup>2</sup>

Words listed in Table 88 and Table 89 have z-, ʐ- or /- as reflexes. Because I have already reconstructed \*ʐ<sup>1</sup>- and \*ʐ<sup>2</sup>- for Table 86 and Table 87, and because \*s<sup>1</sup>- has been reserved for Table 84, a different proto phoneme must be reconstructed for the onset consonant in Table 88 and Table 89. Given the majority-wins principle where most reflexes are [+coronal], I reconstruct \*z<sup>1</sup>- and \*z<sup>2</sup>- for these two tables, respectively. It is noteworthy that Huangtong (皇桐) (as well as Maniao 馬裊) has two variants, ʐ- and /-, as its reflexes. I propose that this is due to its proximity to languages with different reflexes. To the east of Huangtong (皇桐) lie the varieties that reflect \*z<sup>1</sup>- and \*z<sup>2</sup>- as ʐ-, and to the west of Huangtong (皇桐) are the varieties that have /- for \*z<sup>1</sup>- and \*z<sup>2</sup>-. As a result of language contact, Huangtong (皇桐) employs two free variants for the same proto initials. The Jialai (加來) data are added here as a basis for comparison.

**Table 88: \*z<sup>1</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	JL (加來)	XY (新盈)
		z-	z-	z-	ʒ-	ʒ- or l-	l-	l-
黑色	'black'	zam <sup>1</sup>	zam <sup>1</sup>	zem <sup>1</sup>	zam <sup>1</sup>	zam <sup>1</sup>	lam <sup>1</sup>	lam <sup>1</sup>
裡面	'inside'	ze <sup>1</sup>	zo <sup>1</sup>	zo <sup>1</sup>	ʒo <sup>1</sup>	--	lo <sup>1</sup>	lo <sup>1</sup> (HM)
膽	'gall'	zoj <sup>1</sup>	zoj <sup>1</sup>	zej <sup>1</sup>	ʒoj <sup>1</sup>	ʒoj <sup>1</sup>	loj <sup>1</sup>	loj <sup>1</sup>
兔子	'rabbit'	zuən <sup>3</sup>	zin <sup>3</sup>	zin <sup>3</sup>	ʒən <sup>3</sup>	ʒən <sup>3</sup>	lən <sup>3</sup>	lən <sup>3</sup>
鹹	'salty'	zan <sup>3</sup>	zan <sup>3</sup>	zan <sup>3</sup>	ʒan <sup>3</sup>	lan <sup>3</sup>	lan <sup>3</sup>	lan <sup>3</sup>
生 (肉)	'raw'	zop <sup>7</sup>	zop <sup>7</sup>	zop <sup>7</sup>	ʒop <sup>7</sup>	ʒip <sup>7</sup>	lip <sup>7</sup>	lip <sup>7</sup>

**Table 89: \*z<sup>2</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	JL (加來)	XY (新盈)
		z-	z-	z-	ʒ-	ʒ- or l-	l-	l-
房屋	'house'	zan <sup>2</sup>	zan <sup>2</sup>	zan <sup>2</sup>	ʒan <sup>2</sup>	ʒan <sup>2</sup>	lan <sup>2</sup>	lan <sup>2</sup>
篩子	'winnowing basket'	zon <sup>2</sup>	zon <sup>2</sup>	zon <sup>2</sup>	ʒon <sup>2</sup>	lon <sup>2</sup>	lon <sup>2</sup>	lon <sup>2</sup>
林投果	'pandanus fruit'	-za <sup>4</sup>	-za <sup>4</sup>	-za <sup>4</sup>	-ʒa <sup>4</sup>	la <sup>4</sup>	-la <sup>4</sup>	-la <sup>4</sup>
舔	'to lick'	--	lim <sup>4</sup>	zim <sup>4</sup>	lim <sup>4</sup>	lim <sup>4</sup>	lim <sup>4</sup>	lim <sup>4</sup>
米	'husked rice'	zop <sup>8</sup>	zap <sup>8</sup>	zep <sup>8</sup>	ʒop <sup>8</sup>	ʒop <sup>8</sup>	lop <sup>8</sup>	lop <sup>8</sup>
蜈蚣	'centipede'	zop <sup>8</sup>	-zop <sup>8</sup>	-zep <sup>8</sup>	ʒop <sup>8</sup>	ʒip <sup>8</sup>	lip <sup>8</sup>	lip <sup>8</sup>

All the words in Table 90 and Table 91 begin with *h-*. \*h<sup>1</sup>- and \*h<sup>2</sup>- are reconstructed respectively.

**Table 90: \*h<sup>1</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		h-	h-	h-	h-	h-	h-
梳子	comb	haj <sup>1</sup>	haj <sup>1</sup>	hej <sup>1</sup>	haj <sup>1</sup>	haj <sup>1</sup>	haj <sup>1</sup>
柱子	pillar	--	hɔw <sup>1</sup>	hew <sup>1</sup>	hɔw <sup>1</sup>	hɔw <sup>1</sup>	hɔw <sup>1</sup>
酸	sour	hua <sup>3</sup>	hua <sup>3</sup>	hua <sup>3</sup>	hua <sup>3</sup>	(h)ua <sup>3</sup>	hua <sup>3</sup>
挑 (擔)	to carry (a pole) on the shoulder	hap <sup>7</sup>	hap <sup>7</sup>	hap <sup>7</sup>	hap <sup>7</sup>	hap <sup>7</sup>	hap <sup>7</sup>

**Table 91: \*h<sup>2</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		h-	h-	h-	h-	h-	h-
含	'to hold in mouth'	ham <sup>2</sup>	ham <sup>2</sup>	(h)am <sup>2</sup>	ham <sup>2</sup>	hɔm <sup>2</sup>	hɔm <sup>2</sup>
煮 (飯)	'to cook (rice)'	hon <sup>2</sup>	hun <sup>2</sup>	hon <sup>2</sup>	hun <sup>2</sup>	hun <sup>2</sup>	hun <sup>2</sup>
穿山甲	'pangolin'	han <sup>4</sup>	hɔn <sup>4</sup>	hɔn <sup>4</sup>	hən <sup>4</sup>	hin <sup>4</sup>	hin <sup>4</sup>
布	'cloth'	hap <sup>8</sup>	hap <sup>8</sup>	hep <sup>8</sup>	hɔp <sup>8</sup>	hɔp <sup>8</sup>	hɔp <sup>8</sup>

### 5.1.3. Proto affricates

Only a handful of words in Ong-Be begin with /ts/, which can be realized as [ts] or [ts<sup>h</sup>]. That is, aspiration is not phonemic in affricates for any Ong-Be varieties. Since all of these words have an identical affricate initial at the segmental level, \*ts<sup>1</sup>- and \*ts<sup>2</sup>- are reconstructed respectively for Table 92 and Table 93. Many of them are early Chinese loans, such as 灶 ‘kitchen range; hearth’ (Middle Chinese: \*tsau), 滴 ‘(to) drop’ (Middle Chinese: \*tiek), 鹿 ‘deer’ (Middle Chinese: \*luk), and 藍 ‘blue; indigo’ (Middle Chinese: \*lam).

**Table 92: \*ts<sup>1</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		ts~ts <sup>h</sup>	ts~ts <sup>h</sup>	ts~ts <sup>h</sup>	ts~ts <sup>h</sup>	ts~ts <sup>h</sup>	ts~ts <sup>h</sup>
小鈸	‘a type of cymbals’	--	-ts <sup>h</sup> ɛ <sup>1</sup>	-ts <sup>h</sup> ɛ <sup>1</sup>	--	ts <sup>h</sup> ɛ <sup>1</sup>	ts <sup>h</sup> ɛ <sup>1</sup>
灶	‘kitchen range’	ts <sup>h</sup> aw <sup>3</sup>	ts <sup>h</sup> aw <sup>3</sup>	tsaw <sup>3</sup>	tsaw <sup>3</sup>	ts <sup>h</sup> aw <sup>3</sup>	ts <sup>h</sup> aw <sup>3</sup>
滴 (v.)	‘to drop’	ts <sup>h</sup> əʔ <sup>7</sup>	tshiʔ <sup>7</sup>	ts <sup>h</sup> iʔ <sup>7</sup>	ts <sup>(h)</sup> əʔ <sup>7</sup>	ts <sup>h</sup> əʔ <sup>7</sup>	ts <sup>h</sup> əʔ <sup>7</sup>

**Table 93: \*ts<sup>2</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		ts~ts <sup>h</sup>	ts~ts <sup>h</sup>	ts~ts <sup>h</sup>	ts~ts <sup>h</sup>	ts~ts <sup>h</sup>	ts~ts <sup>h</sup>
下午	‘afternoon’	-tsew <sup>2</sup>	-ts <sup>h</sup> ɔw <sup>2</sup>	--	-tsɔw <sup>2</sup>	-ts <sup>h</sup> ɔw <sup>2</sup>	-ts <sup>h</sup> ɔw <sup>2</sup>
藍靛草	‘blue; indigo’	ts <sup>h</sup> am <sup>2</sup>	--	tsam <sup>2</sup> (L&Z)	--	tsam <sup>2</sup> (LC)	--
腸	‘intestine’	--	--	-ts <sup>h</sup> ɛ <sup>4</sup>	--	ts <sup>h</sup> ɛ <sup>4</sup>	ts <sup>h</sup> ɛ <sup>4</sup>
溼	‘wet’	ts <sup>h</sup> ak <sup>8</sup>	tsak <sup>8</sup>	ts <sup>h</sup> ɛk <sup>8</sup>	tsak <sup>8</sup>	ts <sup>h</sup> ak <sup>8</sup>	ts <sup>h</sup> ak <sup>8</sup>
鹿	‘deer’	ts <sup>h</sup> uak <sup>8</sup>	ts <sup>h</sup> ok <sup>8</sup>	ts <sup>(h)</sup> ok <sup>8</sup>	ts <sup>h</sup> ok <sup>8</sup>	tsok <sup>8</sup>	ts <sup>h</sup> ok <sup>8</sup>

### 5.1.4. Proto sonorants

Table 94 and Table 95 both consist of words that begin with /-/. Based on the internal evidence, \*l<sup>1</sup>- and \*l<sup>2</sup>- are chosen as proto initials. However, it is not impossible that

voiceless sonorants reflect earlier consonant clusters which left no trace in modern languages.<sup>70</sup>

**Table 94: \*l<sup>1</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		l-	l-	l-	l-	l-	l-
秧苗	'rice seedling'	la <sup>3</sup>	la <sup>3</sup>	la <sup>3</sup>	la <sup>3</sup>	la <sup>3</sup>	la <sup>3</sup>
黃色	'yellow'	lan <sup>1</sup>	lan <sup>1</sup>	lan <sup>1</sup>	lan <sup>1</sup>	lan <sup>1</sup>	lan <sup>1</sup>
梯子	'ladder'	lej <sup>1</sup>	li <sup>1</sup>	li <sup>1</sup>	loj <sup>1</sup>	loj <sup>1</sup>	loj <sup>1</sup>
魚鱗	'fish scale'	luŋ <sup>7</sup>	liŋ <sup>7</sup>	liŋ <sup>7</sup>	liŋ <sup>8</sup> -t	liŋ <sup>7</sup>	liŋ <sup>7</sup>
睡、躺	'to sleep; to lie down'	lap <sup>7</sup>	lap <sup>7</sup>	lap <sup>7</sup>	lap <sup>7</sup>	lap <sup>7</sup>	lap <sup>7</sup>
蠶繭	'cocoon of the silkworm'	luk <sup>7</sup>	luk <sup>7</sup>	luk <sup>7</sup>	--	luk <sup>7</sup>	--

**Table 95: \*l<sup>2</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		l-	l-	l-	l-	l-	l-
藍	'blue'	lam <sup>2</sup>	lam <sup>2</sup>	lam <sup>2</sup>	lam <sup>2</sup>	lam <sup>2</sup>	lam <sup>2</sup>
後	'after; behind; back'	lej <sup>2</sup>	loj <sup>2</sup>	loj <sup>2</sup>	loj <sup>2</sup>	loj <sup>2</sup>	loj <sup>2</sup>
舌頭	'tongue'	lin <sup>4</sup>	lin <sup>4</sup>	lin <sup>4</sup>	lin <sup>4</sup>	lin <sup>4</sup>	lin <sup>4</sup>
多	'many, much'	liaw <sup>4</sup>	liaw <sup>4</sup>	liaw <sup>4</sup>	liaw <sup>4</sup>	liaw <sup>4</sup>	liaw <sup>4</sup>
深	'deep'	læk <sup>8</sup>	læk <sup>8</sup>	læk <sup>8</sup>	læk <sup>8</sup>	læk <sup>8</sup>	læk <sup>8</sup>
兒女	'offspring'	læk <sup>8</sup>	læk <sup>8</sup>	læk <sup>8</sup>	læk <sup>8</sup>	læk <sup>8</sup>	læk <sup>8</sup>

Although all the words in Table 96 and Table 97 begin with *m*-, two proto initials indicating series 1 and 2 have to be reconstructed. Considering the tones, \*m<sup>1</sup>- is assigned to Table 96 and \*m<sup>2</sup>- to Table 97.

<sup>70</sup> Suprasegmental change and segmental change may reflect a different time depth. As shown in the table below, \*gr- and \*kr- of protolanguage X have *ts*<sup>-2</sup> and *ts*<sup>-1</sup> respectively as the reflexes in Language A, whereas these two onsets are reflected as *k*<sup>h-2</sup> and *k*<sup>h-1</sup> in Language B. Regardless of tonal series 2 which points to a voiced segment at the time of the split, there had never been \*dz- (→ *ts*<sup>-2</sup>) in Language A or \*g<sup>h</sup>- (→ *k*<sup>h-2</sup>) in Language B. In other words, the suprasegmental change predates segmental change.

Language A	Language B
*gr- > *kr <sup>-2</sup> > <i>ts</i> <sup>-2</sup>	*gr- > *kr <sup>-2</sup> > <i>k</i> <sup>h-2</sup>
*kr- > *kr <sup>-1</sup> > <i>ts</i> <sup>-1</sup>	*kr- > *kr <sup>-1</sup> > <i>k</i> <sup>h-1</sup>

**Table 96: \*m<sup>1</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		m-	m-	m-	m-	m-	m-
狗	'dog'	ma <sup>1</sup>	ma <sup>1</sup>	ma <sup>1</sup>	ma <sup>1</sup>	ma <sup>1</sup>	ma <sup>1</sup>
客人	'guest'	me <sup>1</sup>	mɔ <sup>1</sup>	--	mo <sup>1</sup>	mɔ <sup>1</sup>	mɔ <sup>1</sup>
豬	'pig'	mow <sup>1</sup>	mu <sup>1</sup>	mu <sup>1</sup>	mow <sup>1</sup>	mo <sup>1</sup>	mo <sup>1</sup>
線	'thread'	mɔj <sup>1</sup>	mɔj <sup>1</sup>	mɛj <sup>1</sup>	mɔj <sup>1</sup>	mɔj <sup>1</sup>	mɔj <sup>1</sup>
甘蔗	'sugarcane'	maj <sup>3</sup>	maj <sup>3</sup>	maj <sup>3</sup>	maj <sup>3</sup>	maj <sup>3</sup>	maj <sup>3</sup>
跳蚤	'flea'	mat <sup>7</sup>	mat <sup>7</sup>	mat <sup>7</sup>	mat <sup>7</sup>	mat <sup>7</sup>	mat <sup>7</sup>

**Table 97: \*m<sup>2</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		m-	m-	m-	m-	m-	m-
手	'hand'	me <sup>2</sup>	mɔ <sup>2</sup>	mɔ <sup>2</sup>	mo <sup>2</sup>	mɔ <sup>2</sup>	mɔ <sup>2</sup>
你	'2SG'	mɔ <sup>3</sup> -t	mɔ <sup>2</sup>	me <sup>2</sup>	mə <sup>2</sup>	mə <sup>2</sup>	mə <sup>2</sup>
蟲	'bug; worm'	miŋ <sup>2</sup>	miŋ <sup>2</sup>	mɛŋ <sup>2</sup>	miŋ <sup>2</sup>	miŋ <sup>2</sup>	miŋ <sup>2</sup>
雌性	'female'	maj <sup>4</sup>	maj <sup>4</sup>	maj <sup>4</sup>	maj <sup>4</sup>	maj <sup>4</sup>	maj <sup>4</sup>
稻草	'straw'	mun <sup>4</sup>	mun <sup>4</sup>	mun <sup>4</sup>	mun <sup>4</sup>	mun <sup>4</sup>	mun <sup>4</sup>
刀	'knife'	mit <sup>8</sup>	mit <sup>8</sup>	mit <sup>8</sup>	mit <sup>8</sup>	mit <sup>8</sup>	mit <sup>8</sup>
鼻涕	'mucus'	muk <sup>8</sup>	ŋuk <sup>8</sup>	mok <sup>8</sup>	muk <sup>8</sup>	muk <sup>8</sup>	muk <sup>8</sup>

Table 98 and Table 99 contain words beginning with *n-*, reflecting series 1 and series 2 with respect to initials. I suggest that \*n<sup>1</sup>- be reconstructed for Table 98 and \*n<sup>2</sup>- for Table 99.

**Table 98: \*n<sup>1</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		n-	n-	n-	n-	n-	n-
皮膚	'skin'	nan <sup>1</sup>	nan <sup>1</sup>	nen <sup>1</sup>	nan <sup>1</sup>	nan <sup>1</sup>	nan <sup>1</sup>
名字	'name'	nɔj <sup>1</sup>	nɔj <sup>1</sup>	nej <sup>1</sup>	nɔj <sup>1</sup>	nɔj <sup>1</sup>	nɔj <sup>1</sup>
厚	'thick' (not thin)	na <sup>1</sup>	na <sup>1</sup>	na <sup>1</sup>	na <sup>1</sup>	na <sup>1</sup>	na <sup>1</sup>
臉	'face'	na <sup>3</sup>	na <sup>3</sup>	na <sup>3</sup>	na <sup>3</sup>	na <sup>3</sup>	na <sup>3</sup>
借	'to borrow; to lend'	naj <sup>3</sup>	naj <sup>3</sup>	naj <sup>3</sup>	naj <sup>3</sup>	naj <sup>3</sup>	naj <sup>3</sup>
冷	'cold'	nit <sup>7</sup>	nit <sup>7</sup>	nit <sup>7</sup>	nit <sup>7</sup>	nit <sup>7</sup>	nit <sup>7</sup>



**Table 99: \*n<sup>2</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		n-	n-	n-	n-	n-	n-
舂 (米)	'to pound (rice)'	nam <sup>2</sup>	nam <sup>2</sup>	nam <sup>2</sup>	nam <sup>2</sup>	nam <sup>2</sup>	nam <sup>2</sup>
竹筍	'bamboo shoot'	nan <sup>2</sup>	nan <sup>2</sup>	nan <sup>2</sup>	nan <sup>2</sup>	nan <sup>2</sup>	nan <sup>2</sup>
水田	'paddy field'	nia <sup>2</sup>	nia <sup>2</sup>	nia <sup>2</sup>	nia <sup>2</sup>	nia <sup>2</sup>	nia <sup>2</sup>
水	'water'	nam <sup>4</sup>	nam <sup>4</sup>	nam <sup>4</sup>	nam <sup>4</sup>	nam <sup>4</sup>	nam <sup>4</sup>
肉	'flesh; meat'	nan <sup>4</sup>	nan <sup>4</sup>	nan <sup>4</sup>	nan <sup>4</sup>	nan <sup>4</sup>	nan <sup>4</sup>
水獺	'otter'	nak <sup>8</sup> (XIN)	--	nak <sup>8</sup> (L&Z)	--	nak <sup>8</sup> (BL)	--
鳥	'bird'	nuak <sup>8</sup>	nok <sup>8</sup>	nok <sup>8</sup>	nok <sup>8</sup>	nok <sup>8</sup>	nok <sup>8</sup>

Parallel to the above nasal sets, Table 100 and Table 101 have the same initial but with different tonal series. Given the modern reflex, \* $\eta$ <sup>1</sup>- is reconstructed for Table 100 and \* $\eta$ <sup>2</sup>- for Table 101. It is noteworthy that all varieties in Lingao County maintain the \* $\eta$ <sup>2</sup>-\*n contrast, except for Xinying (新盈) in which \* $\eta$ <sup>1</sup>- and \* $\eta$ <sup>2</sup>- have lost nasality. By contrast, \* $\eta$ <sup>1</sup>- and \* $\eta$ <sup>2</sup>- in Changliu (長流), Yongxing (永興), and Longtang (龍塘) have merged with \*n<sup>1</sup>- and \*n<sup>2</sup>-.

**Table 100: \* $\eta$ <sup>1</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		n-	n-	n-	n-	$\eta$ <sup>1</sup> -	z-
玩	'to play'	nam <sup>1</sup>	nam <sup>33</sup> -t	--	nam <sup>1</sup>	$\eta$ <sup>1</sup> am <sup>1</sup>	zam <sup>1</sup>
蛋	'egg'	nɔm <sup>1</sup>	nam <sup>1</sup>	nem <sup>1</sup>	num <sup>1</sup>	$\eta$ <sup>1</sup> um <sup>1</sup>	zum <sup>1</sup>
鹽	'salt'	naw <sup>3</sup>	naw <sup>3</sup>	naw <sup>3</sup>	naw <sup>3</sup>	$\eta$ <sup>1</sup> aw <sup>3</sup>	zaw <sup>3</sup>
韌	'pliable but strong'	nat <sup>7</sup>	nat <sup>7</sup>	nat <sup>7</sup>	nat <sup>7</sup>	$\eta$ <sup>1</sup> at <sup>7</sup>	zat <sup>7</sup>

**Table 101: \* $\eta$ <sup>2</sup>-**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		n-	n-	n-	n-	$\eta$ <sup>2</sup> -	z-
蚊子	'mosquito'	-non <sup>2</sup>	-nun <sup>2</sup>	non <sup>2</sup>	nun <sup>2</sup>	$\eta$ <sup>2</sup> un <sup>2</sup>	zun <sup>2</sup>
樹根	'tree root'	na <sup>2</sup> -	--	--	na <sup>2</sup> -	$\eta$ <sup>2</sup> a <sup>2</sup> -	za <sup>2</sup> -
縫 (衣)	'to sew'	--	nap <sup>7</sup> -t	nep <sup>8</sup> (L&Z)	nap <sup>8</sup>	$\eta$ <sup>2</sup> ɔp <sup>8</sup> (LC)	zɔp <sup>8</sup>

Table 102 provides a list of words that begin with  $\eta$ - or *m*-. While both Huangtong (皇桐) and Xinying (新盈) have  $\eta$ - for 'to sit' and 'shadow', Changliu (長流) has  $\eta$ - and *m*- and Yongxing (永興) and Longtang (龍塘) have *m*-. However, because *m*- seems to occur

only before *-u-*, *ŋ-* should be the best reconstruction. Assimilation of the rounding and labiality of the vowel *u* is very common. Given the tonal series, *\*ŋ<sup>1-</sup>* is consequently reconstructed here.

**Table 102: *\*ŋ<sup>1-</sup>***

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		ŋ-, m-/__u	ŋ-, m-/__u	ŋ-, m-/__u	ŋ-	ŋ-	ŋ-
坐	‘to sit’	ŋow <sup>1</sup>	mu <sup>1</sup>	mu <sup>1</sup>	ŋəw <sup>1</sup>	ŋo <sup>1</sup>	ŋo <sup>1</sup>
影子	‘shadow’	muj <sup>1</sup>	muj <sup>1</sup>	muj <sup>1</sup>	ŋuj <sup>1</sup>	ŋuj <sup>1</sup>	ŋuj <sup>1</sup>
哭	‘to cry’	ŋaj <sup>3</sup>	ŋaj <sup>3</sup>	ŋaj <sup>3</sup>	ŋaj <sup>3</sup>	ŋaj <sup>3</sup>	ŋaj <sup>3</sup>
熟	‘ripe’	ŋaw <sup>3</sup>	ŋaw <sup>3</sup>	ŋaw <sup>3</sup>	ŋaw <sup>3</sup>	ŋaw <sup>3</sup>	ŋaw <sup>3</sup>
啞	‘mute’	ŋop <sup>7</sup>	ŋɔp <sup>7</sup>	ŋɔp <sup>7</sup>	ŋop <sup>7</sup>	ŋop <sup>7</sup>	ŋop <sup>7</sup>

Table 103 consists of words that have a velar nasal as the initial, to which I assign *\*ŋ<sup>2-</sup>* as the proto phoneme.

**Table 103: *\*ŋ<sup>2-</sup>***

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		ŋ-	ŋ-	ŋ-	ŋ-	ŋ-	ŋ-
蛇	‘snake’	ŋia <sup>2</sup>	ŋia <sup>2</sup>	ŋia <sup>2</sup>	ŋia <sup>2</sup>	ŋia <sup>2</sup>	ŋia <sup>2</sup>
乾飯	‘cooked rice’	ŋaj <sup>2</sup>	ŋaj <sup>2</sup>	ŋaj <sup>2</sup>	ŋaj <sup>2</sup>	ŋaj <sup>2</sup>	ŋaj <sup>2</sup>
稻	‘rice in the field’	ŋaw <sup>4</sup>	ŋaw <sup>4</sup>	ŋaw <sup>4</sup>	ŋaw <sup>4</sup>	ŋaw <sup>4</sup>	ŋaw <sup>4</sup>
柚子	‘pomelo’	-ŋuak <sup>8</sup>	-ŋok <sup>8</sup>	-ŋok <sup>8</sup>	-ŋok <sup>8</sup>	-ŋok <sup>8</sup> (Maniao)	-ŋok <sup>8</sup>
針	‘needle’	ŋaʔ <sup>8</sup>	ŋaʔ <sup>8</sup>	ŋaʔ <sup>8</sup>	ŋaʔ <sup>8</sup>	ŋaʔ <sup>8</sup>	ŋaʔ <sup>8</sup>

## 5.2. Proto finals

There are three nasals, three voiceless stops, a glottal stop, and two glide finals reconstructible to Proto-Ong-Be (see Table 104), which have no voicing or aspiration contrast in this position – all the stop finals are unreleased and voiceless, and all the nasal and glide finals are voiced. Unlike initials, these finals did not trigger further tonal splits after tones became phonemic in pre-Proto-Ong-Be.

**Table 104: Proto-Ong-Be finals**

	bilabial	alveolar	palatal	velar	glottal
<b>stops</b>	*-p	*-t	--	*-k	*-ʔ
<b>nasals</b>	*-m	*-n	--	*-ŋ	--
<b>glides</b>	*-w	--	*-j	--	--

Table 105 consists of words that end in *-t*. All the modern reflexes retain the original final, so \*-t is assigned to this set.

**Table 105: \*-t**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		-t	-t	-t	-t	-t	-t
韌	'pliable but strong'	nat <sup>7</sup>	nat <sup>7</sup>	nat <sup>7</sup>	nat <sup>7</sup>	ŋat <sup>7</sup>	zat <sup>7</sup>
頭蟲	'head louse'	kat <sup>7</sup>	kat <sup>7</sup>	kat <sup>7</sup>	kat <sup>7</sup>	kat <sup>7</sup>	kat <sup>7</sup>
刀子	'knife'	mit <sup>8</sup>	mit <sup>8</sup>	mit <sup>8</sup>	mit <sup>8</sup>	mit <sup>8</sup>	mit <sup>8</sup>
月份	'month'	ŋit <sup>8</sup>	ŋit <sup>8</sup>	ŋit <sup>8</sup>	ŋit <sup>8</sup>	ŋit <sup>8</sup>	ŋit <sup>8</sup>

In Table 106, all the Ong-Be words end in *-k*. For this reason, it is best to reconstruct \*-k for this set.

**Table 106: \*-k**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		-k	-k	-k	-k	-k	-k
腳	'foot'	kok <sup>7</sup>	kok <sup>7</sup>	kok <sup>7</sup>	kok <sup>7</sup>	kok <sup>7</sup>	kok <sup>7</sup>
芋頭	'taro'	sak <sup>7</sup>	sak <sup>7</sup>	sak <sup>7</sup>	sak <sup>7</sup>	sak <sup>7</sup>	sak <sup>7</sup>
織布機	'loom'	dək <sup>8</sup>	dək <sup>8</sup>	dək <sup>8</sup>	--	dək <sup>8</sup>	dək <sup>8</sup>
兒女	'offspring'	lək <sup>8</sup>	lək <sup>8</sup>	lək <sup>8</sup>	lək <sup>8</sup>	lək <sup>8</sup>	lək <sup>8</sup>
鼻涕	'mucus'	muk <sup>8</sup>	ŋuk <sup>8</sup> -i	mok <sup>8</sup>	muk <sup>8</sup>	muk <sup>8</sup>	muk <sup>8</sup>

Table 107 presents a list of words that have a glottal stop as the final. I thus reconstruct \*-ʔ for this sound correspondence. Note that there are few words in Ong-Be that end in a glottal.

**Table 107: \*-ʔ**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		-ʔ	-ʔ	-ʔ	-ʔ	-ʔ	-ʔ
魚鱗	'fish scale'	luʔ <sup>7</sup>	liʔ <sup>7</sup>	liʔ <sup>7</sup>	liʔ <sup>8</sup> -t	liʔ <sup>7</sup>	liʔ <sup>7</sup>
吞、嚥	'to swallow'	ləʔ <sup>7</sup>	liʔ <sup>7</sup>	liʔ <sup>7</sup>	ləʔ <sup>7</sup>	ləʔ <sup>7</sup>	--
血	'blood'	bəʔ <sup>7</sup>	bəʔ <sup>7</sup>	bəʔ <sup>7</sup>	bəʔ <sup>8</sup> -t	bəʔ <sup>7</sup>	bəʔ <sup>7</sup>
硬	'firm; hard'	zuaʔ <sup>7</sup>	zuaʔ <sup>7</sup>	zuaʔ <sup>7</sup>	zuaʔ <sup>7</sup>	luaʔ <sup>7</sup>	luaʔ <sup>7</sup>
螞蟻	'ant'	muʔ <sup>8</sup>	muʔ <sup>8</sup>	moʔ <sup>8</sup>	muʔ <sup>8</sup>	muʔ <sup>8</sup>	muʔ <sup>8</sup>
針	'needle'	ŋəʔ <sup>8</sup>	ŋəʔ <sup>8</sup>	ŋəʔ <sup>8</sup>	ŋəʔ <sup>8</sup>	ŋəʔ <sup>8</sup>	ŋəʔ <sup>8</sup>

Table 108 is composed of a set of words with *-m* as their finals. Internal evidence supports the reconstruction of *\*-m* as the proto final for this set.

**Table 108: \*-m**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		-m	-m	-m	-m	-m	-m
抬	'to lift'	ham <sup>1</sup>	ham <sup>1</sup>	ham <sup>1</sup>	ham <sup>1</sup>	ham <sup>1</sup>	ham <sup>1</sup>
苦	'bitter'	kam <sup>2</sup>	kam <sup>2</sup>	kam <sup>2</sup>	kam <sup>2</sup>	kam <sup>2</sup>	kam <sup>2</sup>
低	'low'	dom <sup>3</sup>	dom <sup>3</sup>	dom <sup>3</sup>	dom <sup>3</sup>	dom <sup>3</sup>	dom <sup>3</sup>
晚上	'night'	kim <sup>4</sup>	kom <sup>4</sup>	kom <sup>4</sup>	--	kɔm <sup>4</sup>	kɔm <sup>4</sup>
舔	'to lick'	--	lim <sup>4</sup>	zim <sup>4</sup>	lim <sup>4</sup>	lim <sup>4</sup>	lim <sup>4</sup>

All the words in Table 109 end in *-n*. For this reason, *\*-n* is reconstructed as the final for this set.

**Table 109: \*-n**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		-n	-n	-n	-n	-n	-n
雨	'rain'	p <sup>h</sup> an <sup>1</sup>	p <sup>h</sup> ɔn <sup>1</sup>	p <sup>h</sup> en <sup>1</sup>	fun <sup>1</sup>	fun <sup>1</sup>	p <sup>h</sup> un <sup>1</sup>
房屋	'house'	zan <sup>2</sup>	zan <sup>2</sup>	zan <sup>2</sup>	zan <sup>2</sup>	lan <sup>2</sup>	zan <sup>2</sup>
吃	'to eat'	kɔn <sup>1</sup>	kɔn <sup>1</sup>	kɔn <sup>1</sup>	kɔn <sup>1</sup>	kɔn <sup>1</sup>	kɔn <sup>1</sup>
熱	'hot; to heat'	lun <sup>3</sup>	lun <sup>3</sup>	lun <sup>3</sup>	lun <sup>3</sup>	lun <sup>3</sup>	lun <sup>3</sup>
汗水	'sweat;	hen <sup>4</sup>	hɔn <sup>4</sup>	hɔn <sup>4</sup>	hon <sup>4</sup>	hɔn <sup>4</sup>	hɔn <sup>4</sup>

Table 110 presents a list of words that end in a velar nasal. Hence, *\*-ŋ* is reconstructed here.

**Table 110: \*-ŋ**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		-ŋ	-ŋ	-ŋ	-ŋ	-ŋ	-ŋ
水蛭	'aquatic leech'	-biŋ <sup>1</sup>	-biŋ <sup>1</sup>	-biŋ <sup>1'</sup>	biŋ <sup>1</sup>	biŋ <sup>1</sup>	biŋ <sup>1</sup>
皮膚	'skin'	naŋ <sup>1</sup>	naŋ <sup>1</sup>	neŋ <sup>1'</sup>	naŋ <sup>1</sup>	naŋ <sup>1</sup>	naŋ <sup>1</sup>
篩子	'winnowing basket'	zɔŋ <sup>2</sup>	zɔŋ <sup>2</sup>	zɔŋ <sup>2</sup>	ʒɔŋ <sup>2</sup>	lɔŋ <sup>2</sup>	lɔŋ <sup>2</sup>
鹹	'salty'	zaŋ <sup>3</sup>	zaŋ <sup>3</sup>	zaŋ <sup>3</sup>	ʒaŋ <sup>3</sup>	laŋ <sup>3</sup>	laŋ <sup>3</sup>
稻草	'straw'	muŋ <sup>4</sup>	muŋ <sup>4</sup>	muŋ <sup>4</sup>	muŋ <sup>4</sup>	muŋ <sup>4</sup>	muŋ <sup>4</sup>

Because all the words in Table 111 end with a bilabial stop, \*-p is the most suitable candidate for the proto final.

**Table 111: \*-p**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		-p	-p	-p	-p	-p	-p
挑 (擔)	'to carry with a shoulder pole'	hap <sup>7</sup>	hap <sup>7</sup>	hap <sup>7</sup>	hap <sup>7</sup>	hap <sup>7</sup>	hap <sup>7</sup>
生 (肉)	'raw'	zɔp <sup>7</sup>	zɔp <sup>7</sup>	zɔp <sup>7'</sup>	ʒɔp <sup>7</sup>	ʒip <sup>7</sup>	lip <sup>7</sup>
睡、躺	'to sleep; to lie down'	lap <sup>7</sup>	lap <sup>7</sup>	lap <sup>7'</sup>	lap <sup>7</sup>	lap <sup>7</sup>	lap <sup>7</sup>
米	'husked rice'	zɔp <sup>8</sup>	zɔp <sup>8</sup>	zɛp <sup>8'</sup>	ʒɔp <sup>8</sup>	ʒɔp <sup>8</sup>	lɔp <sup>8</sup>

Two glides, -w and -j, can serve as codas as well. Because all the modern data in Table 112 and Table 113 consist of -j and -w respectively, \*-j and \*-w are reconstructible to Proto-Ong-Be.

**Table 112: \*-j**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		-j	-j	-j	-j	-j	-j
雞	'chicken'	kaj <sup>1</sup>	kɛj <sup>1</sup>	kej <sup>1'</sup>	kaj <sup>1</sup>	kaj <sup>1</sup>	kaj <sup>1</sup>
火	'fire'	bɛj <sup>2</sup>	vɛj <sup>2</sup>	vɛj <sup>2</sup>	vɛj <sup>2</sup>	vɛj <sup>2</sup>	vɛj <sup>2</sup>
扇子	'fan'	p <sup>h</sup> ɔj <sup>2</sup>	p <sup>h</sup> ɔj <sup>2</sup>	p <sup>h</sup> ɔj <sup>2</sup>	fɛj <sup>2</sup>	fɔj <sup>2</sup>	p <sup>h</sup> ɔj <sup>2</sup>
問	'to ask'	tej <sup>3</sup>	tɔj <sup>3</sup>	tɔj <sup>3</sup>	tɔj <sup>3</sup>	tɔj <sup>3</sup>	tɔj <sup>3</sup>
雌性	female	maj <sup>4</sup>	maj <sup>4</sup>	maj <sup>4</sup>	maj <sup>4</sup>	maj <sup>4</sup>	maj <sup>4</sup>

**Table 113: \*-w**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)
		-w	-w	-w	-w	-w	-w
尿	'urine'	zow <sup>1</sup>	zɔw <sup>1</sup>	zɛw <sup>1'</sup>	ʒɔw <sup>1</sup>	ʒɔw <sup>1</sup>	lɔw <sup>1</sup>
蚯蚓	'earthworm'	new <sup>2</sup>	nɔw <sup>2</sup>	nɔw <sup>2</sup>	nɔw <sup>2</sup>	nɔw <sup>2</sup>	nɔw <sup>2</sup>
吠	'to bark'	saw <sup>3</sup>	saw <sup>3</sup>	saw <sup>3</sup>	saw <sup>3</sup>	saw <sup>3</sup>	saw <sup>3</sup>
吹	'to blow'	bew <sup>4</sup>	vɔw <sup>4</sup>	vɔw <sup>4</sup>	vɔw <sup>4</sup>	vɔw <sup>4</sup>	vɔw <sup>4</sup>

### 5.3. Implications: Two approaches, two reconstructions

This section aims at connecting the reconstructed systems using different approaches - one relies on internal evidence (within Ong-Be) and the other consults external evidence (in a Kra-Dai perspective).

#### 5.3.1. Proto-Ong-Be initials in the Kra-Dai context

The reconstruction of Proto-Ong-Be initials based on Ong-Be internal evidence given in Table 68 is reproduced as Table 114 for ease of discussion.

**Table 114: Proto-Ong-Be initials (recap.)**

	bilabial	labiodental	alveolar	alveolopalatal	velar	glottal
<b>stops</b>	*p <sup>h1</sup> *p <sup>h2</sup>		*t <sup>1</sup> *t <sup>2</sup>		*k <sup>1</sup> *k <sup>2</sup> *k <sup>h1</sup> *k <sup>h2</sup>	*ʔ <sup>1</sup>
<b>implosives</b>	*ɓ <sup>1</sup> *ɓ <sup>2</sup>		*ɗ <sup>1</sup> *ɗ <sup>2</sup>			
<b>nasals</b>	*m <sup>1</sup> *m <sup>2</sup>		*n <sup>1</sup> *n <sup>2</sup>	*ɲ <sup>1</sup> *ɲ <sup>2</sup>	*ŋ <sup>1</sup> *ŋ <sup>2</sup>	
<b>affricates</b>			*ts <sup>1</sup> *ts <sup>2</sup>			
<b>fricatives</b>		*v <sup>1</sup> *v <sup>2</sup>	*s <sup>1</sup> *s <sup>2</sup> *z <sup>1</sup> *z <sup>2</sup>	*ʃ <sup>1</sup> *ʃ <sup>2</sup>		*h <sup>1</sup> *h <sup>2</sup>
<b>laterals</b>			*l <sup>1</sup> *l <sup>2</sup>			

It is noteworthy that all the selected Ong-Be varieties have lost the initial voicing contrast, so it is impossible to reconstruct it directly based on Ong-Be evidence alone. The connection between the tonal series associated with initial consonants and their modern reflexes can only be built upon when Ong-Be is discussed in a Kra-Dai perspective because (1) a voicing contrast is still maintained in some of today's Kra-Dai languages and is reconstructible in higher nodes of the Kra-Dai language family, and (2) the environments that show how Proto-Ong-Be voiced and voiceless obstruents changed their voicing according to their place of articulation have been completely neutralized in today's Ong-Be. Tonal series 1 and 2 in contemporary Ong-Be varieties show that *an indication* of the earlier voicing contrast, not a voicing contrast *per se*, can be reconstructed if and only if the external evidence is consulted. To put it another way,

without referring to external evidence, a reconstruction of the tonal series within Ong-Be will not be possible.

Ostapirat (2005b) demonstrated how Proto-Kra-Dai obstruents are reflected in contemporary Ong-Be varieties, including how Proto-Ong-Be evolved into today's Ong-Be. If we compare Ostapirat (2005b) and my proposed reconstruction, Proto-Kra-Dai stop initials \*p-, \*b-, \*t-, \*d-, and \*k- are reflected as unaspirated stops in today's Ong-Be, although the Proto-Kra-Dai voicing contrast has been neutralized in Ong-Be while leaving traces in tonal series (see Table 115). Proto-Kra-Dai bilabial and alveolar stops, regardless of their early voicing, are now voiced implosives /b<sup>1</sup>-, /b<sup>2</sup>-, /d<sup>1</sup>-/ and /d<sup>2</sup>-/ in Ong-Be languages. The development of implosives *b*- and *d*- has been reported to be an areal feature in Guangdong, Guangxi, Hainan, and Vietnam (Solnit 1982).

**Table 115: Proto-Kra-Dai stop initials**

English Gloss	Proto-Kra-Dai	Proto-Ong-Be	Changliu (長流)	Longtang (龍塘)	Huangtong (皇桐)	Xinying (新盈)
fish	*p-	*b <sup>1</sup> -	ba <sup>1</sup>	ba <sup>1</sup>	ba <sup>1</sup>	ba <sup>1</sup>
mouth	*p-	*b <sup>1</sup> -	bak <sup>7</sup>	bak <sup>7</sup>	bak <sup>7</sup>	bak <sup>7</sup>
leaf	*b-	*b <sup>2</sup> -	be <sup>2</sup>	bɔ <sup>2</sup>	bɔ <sup>2</sup>	bɔ <sup>2</sup>
liver	*t-	*d <sup>1</sup> -	--	--	dɔp <sup>7</sup>	dɔp <sup>7</sup>
to fall	*t-	*d <sup>1</sup> -	dok <sup>7</sup>	dok <sup>7</sup>	dok <sup>7</sup>	dok <sup>7</sup>
navel	*d-	*d <sup>2</sup> -	-le <sup>2</sup>	-lɔ <sup>2</sup> or -zɔ <sup>2</sup>	-dɔ <sup>2</sup>	-dɔ <sup>2</sup>
chicken	*k-	*k <sup>1</sup> -	kaj <sup>1</sup>	kɛj <sup>1</sup>	kaj <sup>1</sup>	kaj <sup>1</sup>
old (not new)	*k-	*k <sup>1</sup> -	kaw <sup>3</sup>	kaw <sup>3</sup>	kaw <sup>3</sup>	kaw <sup>3</sup>

Ostapirat (2005b:279) also pointed out that the Proto-Kra-Dai voiceless (post)velar stop medials had spirantized to \*ɣ- (intervocalic voicing) before they further strengthened to \*g-, cf. Proto-Kra-Dai voiceless velar initial \*k- which remains as /k<sup>1</sup>-/ (see the last two examples in Table 115). Later, earlier voiced and voiceless velar stops merged (except for reflexes manifested in the tones), becoming voiceless stops /k<sup>1</sup>-/ and /k<sup>2</sup>-/ in contemporary Ong-Be (see Table 116). As discussed in Maddieson (2013), it is harder

to maintain the voicing contrast at the back of the throat. Hence that the early \*g- has devoiced and became /k<sup>2</sup>-/ should not be surprising.

**Table 116: Proto-Kra-Dai -K-<sup>71</sup>**

English Gloss	Proto-Kra-Dai <sup>72</sup>	Proto-Ong-Be	CL (長流)	LT (龍塘)	HT (皇桐)	XY (新盈)
'bitter'	*-K-	*k <sup>2</sup> -	kam <sup>2</sup>	kam <sup>2</sup>	kam <sup>2</sup>	kam <sup>2</sup>
'excrement'	*-K-	*k <sup>2</sup> -	kaj <sup>4</sup>	kaj <sup>4</sup>	kaj <sup>4</sup>	kaj <sup>4</sup>

In my system, in addition to \*d<sup>1</sup>- and \*d<sup>2</sup>-, Proto-Ong-Be has another coronal series \*t<sup>1</sup>- and \*t<sup>2</sup>- which originated from palatalized (post)velar stops and affricates in Proto-Kra-Dai (see Table 117). It is now clear why \*t<sup>1</sup>- and \*t<sup>2</sup>- are reflected as voiceless stops (siding with the velars), given that the reflexes of \*k<sup>1</sup>- and \*k<sup>2</sup>- are voiceless. This piece of evidence shows that implosivization took place before depalatalization. That is, \*d<sup>1</sup>- and \*d<sup>2</sup>- must have become voiced implosives in Ong-Be before \*k<sup>1</sup>- and \*k<sup>2</sup>- depalatalized to dental/alveolar stops, \*t<sup>1</sup>- and \*t<sup>2</sup>-. Otherwise \*t<sup>1</sup>- and \*t<sup>2</sup>- would have merged together with \*d<sup>1</sup>- and \*d<sup>2</sup>-. It also reveals that Proto-Ong-Be initials reformed voicing according to place of articulation (\*d<sup>1</sup>-, \*d<sup>2</sup>-, and bilabials imploded, while \*k<sup>1</sup>- and \*k<sup>2</sup>- devoiced). These sound changes, as suggested in Ostapirat (2005b:281-283), possibly passed through intermediate \*ɬ- and \*ɖ- before merging into \*ɬ-, which later lost palatalization, resulting in /t<sup>1</sup>-/ and /t<sup>2</sup>-/. Again, because none of the Ong-Be reflexes sheds light on early palatalization, it is impossible to reconstruct a palatalized segment and past voicing contrast in Ong-Be without referring to external evidence.

<sup>71</sup> The capital K refers to Proto-Kra-Dai (post)velar stop medials \*-k- or \*-q- (Ostapirat 2005b:281-282).

<sup>72</sup> The Proto-Kra-Dai data used for comparison are after Ostapirat (2005b).



**Table 117: Proto-Kra-Dai palatalized obstruents**

English Gloss	Proto-Kra-Dai	Proto-Ong-Be	Changliu (長流)	Longtang (龍塘)	Huangtong (皇桐)	Xinying (新盈)
'to reply'	*C <sub>o</sub> -Kj-	t <sup>1</sup> -	tan <sup>A1</sup>	tan <sup>1</sup>	tan <sup>1</sup>	tan <sup>1</sup>
'to crow'	*C <sub>o</sub> -Kj-	t <sup>1</sup> -	tan <sup>1</sup>	tan <sup>1</sup>	tan <sup>1</sup>	tan <sup>1</sup>
'to ask'	*tsj-	t <sup>1</sup> -	tej <sup>3</sup>	toj <sup>3</sup>	toj <sup>3</sup>	toj <sup>3</sup>
'tail'	*tj-	t <sup>1</sup> -	tuʔ <sup>7</sup>	tuʔ <sup>7</sup>	tuʔ <sup>7</sup>	tuʔ <sup>7</sup>
'thatch grass'	*-Kj-	t <sup>2</sup> -	tia <sup>2</sup>	tia <sup>2</sup>	tia <sup>2</sup>	tia <sup>2</sup>

As for the contemporary fricative initials, such as /v<sup>1</sup>-/, /v<sup>2</sup>-/, /z<sup>1</sup>-/, /z<sup>2</sup>-/ and /h<sup>1</sup>-/, many of them originated from Proto-Kra-Dai medial stops, as illustrated in Table 118 (see Ostapirat 2005b for a detailed discussion on Proto-Kra-Dai to Ong-Be, and Michaud 2012 on the development of spirantization of medial stops in today's monosyllabic languages). Since all the Kra-Dai complex onsets have been simplified in Ong-Be, it is impossible to reconstruct such a system using the comparative method due to lack of convincing evidence.

**Table 118: Proto-Kra-Dai stop medials**

English Gloss	Proto-Kra-Dai	Proto-Ong-Be	Changliu (長流)	Longtang (龍塘)	Huangtong (皇桐)	Xinying (新盈)
'shoulder'	*C <sub>o</sub> -p-	v <sup>1</sup> -	-bia <sup>3</sup>	-bia <sup>3</sup>	-via <sup>3</sup>	-via <sup>3</sup> 'arm'
'to fly'	*C <sub>o</sub> -p-	v <sup>1</sup> -	ban <sup>1</sup>	ben <sup>1</sup>	vin <sup>1</sup>	vin <sup>1</sup>
'fire'	*-p-	v <sup>2</sup> -	bej <sup>2</sup>	vej <sup>2</sup>	vəj <sup>2</sup>	vəj <sup>2</sup>
'chaff'	*-p-	v <sup>2</sup> -	be <sup>4</sup>	vo <sup>4</sup>	vo <sup>4</sup>	vo <sup>4</sup>
'rain'	*k-p-	p <sup>h1</sup> -	p <sup>h</sup> an <sup>1</sup>	p <sup>h</sup> en <sup>1</sup>	fun <sup>1</sup>	p <sup>h</sup> un <sup>1</sup>
'foxtail millet'	*k-p-	p <sup>h1</sup> -	ban <sup>4</sup> -t	van <sup>4</sup> -t, -i	fan <sup>3</sup>	p <sup>h</sup> an <sup>3</sup>
'raw'	*C <sub>o</sub> -d-	z <sup>1</sup> -	zop <sup>7</sup>	zop <sup>7</sup>	zip <sup>7</sup>	lip <sup>7</sup>
'nose'	*C <sub>o</sub> -d-	z <sup>1</sup> -	zon <sup>1</sup>	zon <sup>1</sup>	lon <sup>1</sup>	lon <sup>1</sup>
'boat'	*C/V-d-	z <sup>2</sup> -	zua <sup>4</sup>	zua <sup>4</sup>	lua <sup>4</sup>	lua <sup>4</sup>
'root' <sup>73</sup>	*C/V-d-	z <sup>2</sup> -	--	ziak <sup>8</sup>	liak <sup>8</sup>	liak <sup>8</sup>
'to carry on pole'	*k-t-	h <sup>1</sup> -	hap <sup>7</sup>	hap <sup>7</sup>	hap <sup>7</sup>	hap <sup>7</sup>
'to carry by two people'	*k-t-	h <sup>1</sup> -	ham <sup>1</sup>	ham <sup>1</sup>	ham <sup>1</sup>	ham <sup>1</sup>

<sup>73</sup> In Western Ong-Be, the Kra-Dai word for 'root' is preserved in the lexical item *Ficus microcarpa* (a type of banyan tree with small sized leaves).

Proto-Ong-Be alveolo-palatal fricative in Table 119 was derived from Proto-Kra-Dai voiced fricatives. Proto-Kra-Dai voiced fricatives are now reflected as /z<sup>1</sup>-/ and /k<sup>h1</sup>-/ in Eastern Ong-Be, but /ʒ<sup>1</sup>-/ and /k<sup>h1</sup>-/ or /x<sup>1</sup>-/ in Western Ong-Be. Proto-Ong-Be \*k<sup>h1</sup>- results from the collapse of Proto-Kra-Dai di- or sesquisyllabicity where the minor syllable onset clustered with the major syllable onset, as exemplified in ‘heavy’ and ‘light’. By contrast, the early pretonic syllable onset \*k- in ‘medicine’ left no reconstructible traces in contemporary Ong-Be.

**Table 119: Proto-Kra-Dai voiced fricatives**

English Gloss	Proto-Kra-Dai	Proto-Ong-Be	Changliu (長流)	Longtang (龍塘)	Huangtong (皇桐)	Xinying (新盈)
‘hungry’	*ʒ-	*ʒ <sup>1</sup> -	zak <sup>7</sup>	zak <sup>7</sup>	ziak <sup>7</sup>	ziak <sup>7</sup>
‘to stand’	*ʒ-	*ʒ <sup>1</sup> -	zun <sup>1</sup>	zun <sup>1</sup>	ɲun <sup>1</sup>	zun <sup>1</sup>
‘medicine’	*k-dʒ-	*ʒ <sup>1</sup> -	zia <sup>1</sup>	zia <sup>1</sup>	ʒia <sup>1</sup>	ʒia <sup>1</sup>
‘heavy’	*K-z-	*k <sup>h1</sup> -	k <sup>h</sup> en <sup>1</sup>	k <sup>h</sup> ɔn <sup>1</sup>	xɔn <sup>1</sup>	k <sup>h</sup> ɔn <sup>1</sup>
‘light (not heavy)’	*K-z-	*k <sup>h1</sup> -	k <sup>h</sup> e <sup>3</sup>	k <sup>h</sup> ɔ <sup>3</sup>	xɔ <sup>3</sup>	k <sup>h</sup> ɔ <sup>3</sup>

Table 120 shows that the Proto-Ong-Be initials \*s<sup>1</sup>- and \*ts<sup>2</sup>- were derived from the Proto-Kra-Dai consonant clusters containing \*-r-. The data below clearly demonstrate that the Proto-Kra-Dai proto voiceless initials have led to tonal series 1 and the proto voiced initials have developed into series 2 in today’s Ong-Be languages. One might wonder about the development of Proto-Ong-Be \*s<sup>2</sup>- and \*ts<sup>1</sup>- from a Kra-Dai perspective. The words given in Table 85 (\*s<sup>2</sup>-) and Table 92 (\*ts<sup>1</sup>-), although reconstructible using internal evidence for the latter, are early Chinese loans borrowed before Proto-Ong-Be branched. These words are not reconstructible to the Proto-Kra-Dai level because they are not found in primary subgroups immune to Chinese influence due to lack of contact.

**Table 120: Proto-Kra-Dai -r-**

English Gloss	Proto-Kra-Dai <sup>74</sup>	Proto-Ong-Be	Changliu (長流)	Longtang (龍塘)	Huangtong (皇桐)	Xinying (新盈)
'taro'	*Pr- or Kr-	*s <sup>1</sup> -	sak <sup>7</sup>	sak <sup>7</sup>	sak <sup>7</sup>	sak <sup>7</sup>
'to bark'	*Pr- or Kr-	*s <sup>1</sup> -	saw <sup>3</sup>	saw <sup>3</sup>	saw <sup>3</sup>	saw <sup>3</sup>
'road'	*Pr- or Kr-	*s <sup>1</sup> -	son <sup>1</sup>	sen <sup>1</sup>	sun <sup>1</sup>	sun <sup>1</sup>
'tomorrow'	*Br- or *Gr-	*ts <sup>2</sup> -	ts <sup>h</sup> ek <sup>8</sup>	ts <sup>(h)</sup> ek <sup>8</sup>	ts <sup>h</sup> ek <sup>8</sup>	ts <sup>h</sup> ek <sup>8</sup>
'wet'	*Br- or *Gr-	*ts <sup>2</sup> -	ts <sup>h</sup> ak <sup>8</sup>	ts <sup>h</sup> ek <sup>8</sup>	tsak <sup>8</sup>	tsak <sup>8</sup>

Note that as mentioned earlier, Ong-Be s-, originating from Proto-Kra-Da \*-r-, corresponds to *Jizhao Haihua* (吉兆海話) ts-. Based on Ostapirat (1998:341), the earlier form of my proposed \*s<sup>1</sup>- could be an affricate.

Table 121 presents an inverted reconstruction of the Proto-Ong-Be initial system based on Ostapirat (2005b; 2017, p.c.). Ostapirat (2005b:288-289) specifically proposed four changes, which took place in chronological order, to account for a sound change from Proto-Kra-Dai voiceless medial stops to today's Ong-Be initials. They are (1) lenition (intervocalic voicing & spirantization of voiceless medial stops), (2) occlusion (the outputs from the previous step became stops or affricates, except for labiodentals), (3) devoicing (for velar stops, including palatalized velars which later became palatals) and implosivization (for alveolar and labial stops), and (4) depalatalization (for palatals).

**Table 121: An inverted reconstruction<sup>75</sup> of Proto-Ong-Be initials (not exhaustive)**

	bilabial		labiodental		alveolar		(alveolo)palatal		velar		glottal	
<b>nasals</b>	*m̥	*m			*n̥	*n	*ɲ̥	*ɲ	*ŋ̥	*ŋ		
<b>stops</b>	*p	*b			*t	*d	*t̪	*d̪	*k	*g	*ʔ	
<b>affricates</b>					*ts			*dʒ				
<b>fricatives</b>			*ʋ̥	*ʋ	*s			*ʃ	*x	*ɣ	*h	
<b>liquids</b>					*l̥	*l	*ɾ̥	*ɾ				

<sup>74</sup> The capital P stands for a proto voiceless bilabial initial, B for a proto voiced bilabial initial, and G for a proto voiced (post)velar initial.

<sup>75</sup> An inverted reconstruction is to assign phonetic values to a place-holder "from above", when internal evidence does not allow certain features to be reconstructed (see Anttila 1989:346 and Fox 1995:88-89 for more details). For example, different accentuations in Proto-Germanic can only be determined using Proto-Indo-European.

Sound change from Pre-Proto-Ong-Be to Proto-Ong-Be to modern Ong-Be are shown in Table 122. Note that this table does not exhaust all the phonemes.

**Table 122: From Proto-Kra-Dai to modern Ong-Be (not exhaustive)**

Proto-Kra-Dai (Ostapirat 2005b)	Proto-Ong-Be (Ostapirat 2005b)	Proto-Ong-Be (this study)	Changliu (長流)	Longtang (龍塘)	Huangtong (皇桐)	Xinying (新盈)
*p-	*p	*b <sup>1</sup>	b <sup>1</sup>	b <sup>1</sup>	b <sup>1</sup>	b <sup>1</sup>
*b-	*b	*b <sup>2</sup>	b <sup>2</sup>	b <sup>2</sup>	b <sup>2</sup>	b <sup>2</sup>
*t-	*t	*d <sup>1</sup>	d <sup>1</sup>	d <sup>1</sup>	d <sup>1</sup>	d <sup>1</sup>
*d-	*d	*d <sup>2</sup>	d <sup>2</sup>	d <sup>2</sup>	d <sup>2</sup>	d <sup>2</sup>
*C <sub>o</sub> -Kl-; *tsj-; *tj-	*t	*t <sup>1</sup>	t <sup>1</sup>	t <sup>1</sup>	t <sup>1</sup>	t <sup>1</sup>
*-Kl-	*d	*t <sup>2</sup>	t <sup>2</sup>	t <sup>2</sup>	t <sup>2</sup>	t <sup>2</sup>
*k-	*k	*k <sup>1</sup>	k <sup>1</sup>	k <sup>1</sup>	k <sup>1</sup>	k <sup>1</sup>
*-K-	*g	*k <sup>2</sup>	k <sup>2</sup>	k <sup>2</sup>	k <sup>2</sup>	k <sup>2</sup>
*ʒ-; *k-ɟ-	*ʒ	*z <sup>1</sup>	z <sup>1</sup>	z <sup>1</sup>	z <sup>1</sup>	z <sup>1</sup>
*k-t-; *S-	*h	*h <sup>1</sup>	h <sup>1</sup>	h <sup>1</sup>	h <sup>1</sup>	h <sup>1</sup>
*Pr- or Kr-	*s	*s <sup>1</sup>	s <sup>1</sup>	s <sup>1</sup>	s <sup>1</sup>	s <sup>1</sup>
*Br- or *Gr-	*dz	*ts <sup>2</sup>	ts <sup>2</sup>	ts <sup>2</sup>	ts <sup>2</sup>	ts <sup>2</sup>
*C <sub>o</sub> -d-	*r	*z <sup>1</sup>	z <sup>1</sup>	z <sup>1</sup>	l <sup>1</sup>	l <sup>1</sup>
*C/V-d-	*r	*z <sup>2</sup>	z <sup>2</sup>	z <sup>2</sup>	l <sup>2</sup>	l <sup>2</sup>
*C <sub>o</sub> -p-	*v	*v <sup>1</sup>	b <sup>1</sup>	v <sup>1</sup>	v <sup>1</sup>	v <sup>1</sup>
*-p-	*v	*v <sup>2</sup>	b <sup>2</sup>	v <sup>2</sup>	v <sup>2</sup>	v <sup>2</sup>
*k-p-	*kv	*p <sup>h1</sup>	p <sup>h1</sup>	p <sup>h1</sup>	f <sup>1</sup>	p <sup>h1</sup>
*K-z-	*x	*k <sup>h1</sup>	k <sup>h1</sup>	k <sup>h1</sup>	x <sup>1</sup>	k <sup>h1</sup>
N/A	*ɣ	*k <sup>h2</sup>	k <sup>h2</sup>	k <sup>h2</sup>	x <sup>2</sup>	k <sup>h2</sup>

It is noteworthy that on the basis of Ong-Be internal evidence, there is no direct evidence in postulating the tonal series in Proto-Ong-Be. That is, the correlation between the raised numerals, <sup>1</sup> and <sup>2</sup>, and the earlier voicing contrast can only be determined in comparison of the voicing difference in Kra-Dai languages beyond Ong-Be. Table 56 and Table 122 demonstrate how suprasegmental contrasts derived from the loss of the voicing contrast.

A reconstruction of the Proto-Ong-Be initials based solely on internal evidence, i.e., without the tonal series, is presented in Table 123.

**Table 123: Proto-Ong-Be initials (no tonal series)**

	bilabial	labiodental	alveolar	alveolo-palatal	velar	glottal
<b>stops</b>	*p <sup>h</sup>		*t		*k *k <sup>h</sup>	*ʔ
<b>implosives</b>	*ɓ		*ɗ			
<b>nasals</b>	*m		*n	*ɲ	*ŋ	
<b>affricates</b>			*ts			
<b>fricatives</b>		*v	*s *z	*ʃ		*h
<b>laterals</b>			*l			

### 5.3.2. Proto-Ong-Be finals

Based on internal evidence, I have reconstructed nine Proto-Ong-Be finals. It is noteworthy that Proto-Kra-Dai had two other finals, \*-l and \*-ɭ, not reconstructible in Proto-Ong-Be. Table 124 demonstrates that Proto-Kra-Dai \*-l has merged with \*-n in Ong-Be. The final \*-ɭ, according to Ostapirat (2009:53), “assimilated with the preceding vowel” in Ong-Be. As for the Proto-Kra-Dai final \*-c, it is regularly reflected in Ong-Be as a glottal stop, which I accordingly reconstructed as \*-ʔ.

**Table 124: Proto-Kra-Dai \*-l and \*-c**

Chinese	English	Proto-Kra-Dai	Proto-Ong-Be	Changliu (長流)	Longtang (龍塘)	Huangtong (皇桐)	Xinying (新盈)
吃	‘to eat’	*-n	*-n	kɔn <sup>1</sup>	kɔn <sup>1</sup>	kɔn <sup>1</sup>	kɔn <sup>1</sup>
舌頭	‘tongue’	*-n	*-n	lin <sup>4</sup>	lin <sup>4</sup>	lin <sup>4</sup>	lin <sup>4</sup>
穿山甲	‘pangolin’	*-l	*-n	han <sup>4</sup>	hɔn <sup>4</sup>	hin <sup>4</sup>	hin <sup>4</sup>
石頭	‘stone’	*-l	*-n	din <sup>2</sup>	din <sup>2</sup>	din <sup>2</sup>	din <sup>2</sup>
魚鱗	‘fish scale’	*-c	*-ʔ	luʔ <sup>7</sup>	liʔ <sup>7</sup>	liʔ <sup>7</sup>	liʔ <sup>7</sup>
血	‘blood’	*-c	*-ʔ	baʔ <sup>7</sup>	baʔ <sup>7</sup>	baʔ <sup>7</sup>	baʔ <sup>7</sup>
螞蟻	‘ant’	*-c	*-ʔ	muʔ <sup>8</sup>	moʔ <sup>8</sup>	muʔ <sup>8</sup>	muʔ <sup>8</sup>

There are a few irregular correspondences where external evidence must be resorted to.

They can be classified as follows - (1) irregular onset correspondences, (2) irregular coda correspondences, and (3) irregular voicing correspondences.

In Table 125 the word ‘to come’ shows an *n:m* correspondence in two Ong-Be subgroups. Proto-Tai, Proto-Kam-Sui, Proto-Kra, and Proto-Hlai all have a bilabial initial for ‘to come’. I subsequently reconstruct it as \*m<sup>2</sup>-. Both ‘human’ and ‘mushroom’ are cognate with their Tai equivalents. For ‘human, people’, Proto-Tai has \*khon<sup>A2</sup> in Li

(1997) and \**gwun*<sup>A</sup> in Pittayaporn (2009). Ostapirat (2005b:280) mentioned that “this points to pre-Be labio-velar medial \**-k<sup>w</sup>-*.” Because Ong-Be shows a *v<sup>2</sup>-:h<sup>2</sup>-* correspondence not attested elsewhere, the internal evidence does not shed light on what needs to be reconstructed. Without external evidence, we might conclude that this is just a sporadic change.

The same holds true for ‘mushroom’, which was reconstructed as \**het*<sup>D1</sup> in Li (1977) but \**hrwet*<sup>D</sup> in Pittayaporn (2009). Considering the directionality of sound change, it is possible for an alveolar trill to have developed into a lateral or a fricative. The Changliu data indicate the possibility that an earlier stage of \**h<sup>2</sup>-* might have been an alveolar. Although it does provide clues to an alternative, this piece of evidence is not persuasive enough to revise \**h<sup>2</sup>-* in my system to \**r-*, since this correspondence is non-recurrent.

**Table 125: Irregular onset correspondences**

Chinese	English	Changliu (長流)	Longtang (龍塘)	Huangtong (皇桐)	Xinying (新盈)
來	‘to come’	nia <sup>3</sup> -t	nia <sup>2</sup>	mia <sup>2</sup> (Maniao 馬裊)	mia <sup>2</sup>
人	‘human, people’	ban <sup>2</sup>	von <sup>2</sup>	hun <sup>2</sup>	hun <sup>2</sup>
香菇	‘mushroom’	lot <sup>8</sup> ; hot <sup>8</sup> (XIN)	hat <sup>8</sup>	hit <sup>8</sup>	hit <sup>8</sup>
稀飯	‘cooked rice (generic)’	tia <sup>4</sup>	tia <sup>4</sup>	fia <sup>4</sup>	p <sup>h</sup> ia <sup>4</sup>

With respect to the word ‘ear of rice’ in Table 126, it shows an *ŋ:n* correspondence between two subgroups. By comparing with its equivalent in Proto-Tai which ends in a velar nasal, Proto-Ong-Be is more likely to have \**-ŋ* as the coda.

**Table 126: Irregular coda correspondences**

Chinese	English	Changliu (長流)	Longtang (龍塘)	Huangtong (皇桐)	Xinying (新盈)
稻穗	‘ear of rice’	zəŋ <sup>1</sup>	ziŋ <sup>1</sup>	ləŋ <sup>1</sup>	ləŋ <sup>1</sup>

Table 127 presents two words that differ in its voicing series. Ong-Be internal evidence does not allow me to determine the tone categories. Proto-Hlai has Tone B2 for ‘cat’,

and Proto-Hlai, Proto-Tai, and Proto-Kam-Sui all have Tone C1 for ‘foxtail millet’. I thus conclude that for this two lexical items, the forms in the western Ong-Be subgroup are more conservative.

**Table 127: Irregular voicing correspondences**

Chinese	English	Changliu (長流)	Longtang (龍塘)	Huangtong (皇桐)	Xinying (新盈)
貓	‘cat’	miw <sup>1</sup>	mew <sup>1</sup>	mɛw <sup>2</sup>	mɛw <sup>2</sup>
小米	‘foxtail millet’	baŋ <sup>4</sup>	vaŋ <sup>4</sup>	faŋ <sup>3</sup>	p <sup>h</sup> aŋ <sup>3</sup>

#### 5.4. Interim remarks

With the comparative method, proto phonemes and associated details are reconstructible only when evidence survives. For instance, the voicing contrast in Proto-Ong-Be would be reconstructible only if at least one of today’s Ong-Be varieties maintains such a contrast. Since none of the Ong-Be varieties surveyed in this dissertation reflects this, it is impossible to reconstruct a voicing contrast in proto initials at the level of Proto-Ong-Be. Reflexes in compensatory suprasegmental features, on the other hand, are attested, leading to the inverted reconstruction of tonal series associated with these initial consonants. Because modern Ong-Be languages do not allow consonant clusters anywhere, and all of the regular sound correspondences can be explained based only on the monosyllables that are permitted, no complex initials or complex syllable structures are reconstructed in this study. Nevertheless, the results of my reconstruction and the structure of the contemporary varieties look alike, because few archaic features are preserved. My result would seem to imply a shallower time depth in contrast to a more profound time depth inferred from a top-down approach (one that allows reference to evidence in related languages outside the Ong-Be branch of the family).

By contrast, by consulting external evidence, we are able to see how the Proto-Kra-Dai complex syllable canon became simplified in Ong-Be. An inverted reconstruction (one that allows some external evidence to influence reconstruction decisions) also uncovers details which the selected Ong-Be varieties have lost. The inverted reconstruction in Table 121 shows how Proto-Ong-Be phonemes are reflected accordingly in terms of voicing and their respective position in syllables. Based on a bottom-up reconstruction (that makes reference to only Ong-Be internal information), none of these discoveries can be motivated because no evidence needed upon which to base a supported reconstruction has been retained. The top-down approach also solves the mystery of why Ong-Be *t*- and *d*-, both [+coronal], ended up having different voicing, and it reveals the relative chronology of the implosivization of alveolars and the depalatalization of palatalized velars. However, the top-down approach gives a reconstruction not that directly represents Proto-Ong-Be but rather that represents a stage prior to Proto-Ong-Be, i.e., Pre-Proto-Ong-Be.

This chapter demonstrates how these different approaches to reconstruction yield differing results. Different approaches reflect the phonological system of Ong-Be at different times, which help us better understand the sound changes involved in Ong-Be. Due to lack of written records, the chronology of Ong-Be phonology remains challenging, and the gaps between the results from the different approaches cannot easily be reconciled.



## Chapter 6. Vowels and rhymes in Proto-Ong-Be

The aim of this chapter is to reconstruct proto vowels and associated rhymes (= nucleus plus a coda). I begin with a discussion of particular vowel qualities or of which vowel quantity should be reconstructed for Proto-Ong-Be, followed by a reconstruction of Proto-Ong-Be vowels and an overview of the syllable structure of Proto-Ong-Be.

### 6.1. Vowel quality or vowel quantity?

I show in this section that it is better to reconstruct a vowel length distinction for Proto-Ong-Be rather than different vowel qualities, because the word minimality requires every Proto-Ong-Be syllable to weigh at least two moraes. Below we will see how the quality of the reflexes of proto long vowels are invariant, while that of the reflexes of proto short vowels varies. The fact that certain vowel qualities in contemporary Ong-Be are only attested in closed syllables resulted from the ban on Proto-Ong-Be short vowels in open syllables

Table 128 presents five near minimal pairs with two correspondence sets, i.e.

*a:a:a:a:a* versus *ɑ:a:ɑ~ɐ:a:a:*, which I label as *a*<sup>1</sup> and *a*<sup>2</sup> respectively. We see that vowels in set 1 show the same quality, whereas vowels in set 2 show some differences.

It is also noteworthy that, as presented in Table 131, only *\*a*<sup>1</sup> can be found in open syllables, and not *\*a*<sup>2</sup>.

**Table 128: a<sup>1</sup> and a<sup>2</sup>**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	
嘴	'mouth'	bak <sup>7</sup>	bak <sup>7</sup>	bak <sup>7</sup>	bak <sup>7</sup>	bak <sup>7</sup>	bak <sup>7</sup>	-a <sup>1</sup> -
中餐	'lunch'	bak <sup>8</sup>	bak <sup>8</sup>	bək <sup>8</sup> 'breakfast'	bak <sup>8</sup>	--	bak <sup>8</sup>	-a <sup>2</sup> -
果實	'fruit'	mak <sup>8</sup>	mak <sup>8</sup>	mak <sup>8</sup>	mak <sup>8</sup>	mak <sup>8</sup>	mak <sup>8</sup>	-a <sup>1</sup> -
聾	'deaf'	mak <sup>8</sup>	mak <sup>8</sup>	mək <sup>8</sup>	mak <sup>8</sup>	mak <sup>8</sup>	mak <sup>8</sup>	-a <sup>2</sup> -
舂 (米)	'to pound (rice)'	nam <sup>2</sup>	nam <sup>2</sup>	nam <sup>2</sup>	nam <sup>2</sup>	nam <sup>2</sup>	nam <sup>2</sup>	-a <sup>1</sup> -
水	'water'	nam <sup>4</sup>	nam <sup>4</sup>	nam <sup>4</sup>	nam <sup>4</sup>	nam <sup>4</sup>	nam <sup>4</sup>	-a <sup>2</sup> -
扁擔	'shoulder pole'	ban <sup>2</sup>	van <sup>2</sup>	van <sup>2</sup>	van <sup>2</sup>	van <sup>2</sup>	van <sup>2</sup>	-a <sup>1</sup> -
風	'wind'	ban <sup>3</sup>	van <sup>3</sup>	van <sup>3</sup>	van <sup>3</sup>	van <sup>3</sup>	van <sup>3</sup>	-a <sup>2</sup> -
竹筍	'bamboo shoots'	nan <sup>2</sup>	nan <sup>2</sup>	nan <sup>2</sup>	nan <sup>2</sup>	nan <sup>2</sup>	nan <sup>2</sup>	-a <sup>1</sup> -
皮膚	'skin'	nan <sup>1</sup>	nan <sup>1</sup>	neŋ <sup>1</sup>	nan <sup>1</sup>	nan <sup>1</sup>	nan <sup>1</sup>	-a <sup>2</sup> -

In Table 129, we see that while the last two varieties all contain *-i-* for these three near minimal pairs, the vowels in the first varieties vary between a front vowel and a back vowel, except before a velar coda. I thus label the *i:i:i:i:i* correspondence as *i*<sup>1</sup> and the *ɔ:ɔ:a~e:i~ə:i:i* correspondence as *i*<sup>2</sup>.

**Table 129: i<sup>1</sup> and i<sup>2</sup>**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	
打	'to hit'	kit <sup>7</sup>	kit <sup>7</sup>	kit <sup>7</sup>	kit <sup>7</sup>	kit <sup>7</sup>	kit <sup>7</sup>	-i <sup>1</sup> -
香菇	'mushroom'	lot <sup>8</sup> ; hot <sup>8</sup> (XIN)	hot <sup>8</sup>	hat <sup>8</sup>	hət <sup>8</sup>	hit <sup>8</sup>	hit <sup>8</sup>	-i <sup>2</sup> -
魚鉤	'fish hook'	tin <sup>3</sup>	tin <sup>3</sup>	tin <sup>3</sup>	tin <sup>3</sup>	tin <sup>3</sup>	tin <sup>3</sup>	-i <sup>1</sup> -
牙齒	'tooth'	tɔn <sup>1</sup>	tɔn <sup>1</sup>	tɛn <sup>1</sup>	tɛn <sup>1</sup>	tin <sup>1</sup>	tin <sup>1</sup>	-i <sup>2</sup> -
螞蝗	'land leech'	biŋ <sup>1</sup>	biŋ <sup>1</sup>	biŋ <sup>1</sup>	biŋ <sup>1</sup>	biŋ <sup>1</sup>	biŋ <sup>1</sup>	-i <sup>1</sup> -
蟲	'worm; bug'	miŋ <sup>2</sup>	miŋ <sup>2</sup>	mɛŋ <sup>2</sup>	miŋ <sup>2</sup>	miŋ <sup>2</sup>	miŋ <sup>2</sup>	-i <sup>2</sup> -

Three near minimal pairs are given in Table 130, which demonstrate two sets of regular correspondences, namely *u:u:u:u:u:u* and *u~ɔ:ɔ:ɔ~e:u:u:u*, which I refer to accordingly as *u*<sup>1</sup> and *u*<sup>2</sup>.

**Table 130: u<sup>1</sup> and u<sup>2</sup>**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	
燒 (稻草)	'to burn (straw)'	--	zut <sup>7</sup>	zut <sup>7</sup>	zut <sup>7</sup>	zut <sup>8</sup> -t	lut <sup>7</sup>	-u <sup>1</sup> -
屁	'fart'	ɖut <sup>7</sup>	ɖot <sup>7</sup>	ɖot <sup>7</sup>	ɖut <sup>7</sup>	ɖut <sup>7</sup>	ɖut <sup>7</sup>	-u <sup>2</sup> -
站	'to stand'	zun <sup>1</sup>	zun <sup>1</sup>	zun <sup>1</sup>	nun <sup>1</sup>	ɲun <sup>1</sup>	ʒun <sup>1</sup>	-u <sup>1</sup> -
路	'road'	son <sup>1</sup>	son <sup>1</sup>	sen <sup>1</sup>	sun <sup>1</sup>	sun <sup>1</sup>	sun <sup>1</sup>	-u <sup>2</sup> -
熱	'hot; to heat'	lun <sup>3</sup>	lun <sup>3</sup>	lun <sup>3</sup>	lun <sup>3</sup>	lun <sup>3</sup>	lun <sup>3</sup>	-u <sup>1</sup> -
樹	'tree'	ɖon <sup>3</sup>	ɖon <sup>3</sup>	ɖon <sup>3</sup>	ɖun <sup>3</sup>	ɖun <sup>3</sup>	ɖun <sup>3</sup>	-u <sup>2</sup> -

Generally speaking, before the same codas, vowel qualities in a<sup>1</sup>, i<sup>1</sup>, and u<sup>1</sup> remain the same across the selected varieties. By contrast, vowel qualities in a<sup>2</sup>, i<sup>2</sup>, and u<sup>2</sup> differ in the first three Ong-Be varieties. When the first three varieties are compared with the last two varieties, the reason the last two Ong-Be varieties have the same reflexes for set 1 and set 2 could be attributed to merging. Or we can say that vowels in the first three varieties split but remain unchanged in the last two varieties. If such a vowel difference results from a split, it is not conditioned because both set 1 and set 2 occur in the same linguistic environments. Unconditioned splits are rare and often sporadic. Given that vowel qualities in set 2 differ regularly in Changliu, Yongxing, and Longtang, I eliminate the possibility that a vowel split was the cause. That is, the highly consistent vowel correspondences in Huangtong and Xinying should be regarded as a merger.

If the difference between set 1 and set 2 is residual from Proto-Ong-Be, what would be that be? In order to explain why vowels in Table 128 - Table 130 constantly demonstrate two patterns (invariant and varying), one needs to decide if quality or quantity should be reconstructed. If the quality model is adopted, six contrastive vowels (\*a<sup>1</sup>, \*a<sup>2</sup>, \*i<sup>1</sup>, \*i<sup>2</sup>, \*u<sup>1</sup>, and \*u<sup>2</sup>; or \*a, \*ɑ, \*i, \*ɛ, \*u and \*ɔ) should be reconstructed for the aforementioned tables. If the quantity model is adopted, three vowel qualities (\*a, \*i, and \*u) with contrastive length would be reconstructed. Contemporary Ong-Be does not

have a phonemic vowel length distinction which raises a question as to whether such a distinction is reconstructible using the comparative method.

It is observed that contrastive vowel length in Latin is not seen in its daughter languages. Latin low vowels *ā* and *ǣ* merged and the quantity contrast was lost in the Romance languages. As for other Latin long vowels, i.e., *ī*, *ē*, *ō*, and *ū*, they are regularly reflected with the same qualities in stressed position in Italian and Spanish while losing their weight contrast. Latin short vowels, *ĭ*, *ĕ*, *ĕ*, and *ŭ*, however, have been subject to change, and are not reflected stably with the same qualities. In Italian and Spanish, Latin *ĭ* and *ŭ* in stressed position are reflected as /e/ and /o/, while Latin *ĕ* and *ĕ* shifted in quality (see Alkire and Rosen 2010 for more details). To put it another way, in stressed position Latin *ĭ* and *ŭ* merged with the shortened *ē* and *ō*.

The above-mentioned Ong-Be data can also be explained using the quantity model, since the vowel qualities are consistent in set 1 but vary in set 2, which fit the sound change routes attested from Latin to the Romance languages. I propose that in Ong-Be when a correspondence shows consistency, it reflects a proto long vowel. When reflexes of a single proto vowel vary in a correspondence set, this proto vowel must be short. We will see in the following sections that my proposed proto short vowels are not seen in open syllables, which consolidates my choice in adopting the quantity model. If I chose the quality model, I need to explain why certain vowel qualities are consistently unattested in open syllables.

**Table 131: -a<sup>1</sup>#**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	
魚	'fish'	ba <sup>1</sup>	ba <sup>1</sup>	ba <sup>1</sup>	ba <sup>1</sup>	ba <sup>1</sup>	ba <sup>1</sup>	-a <sup>1</sup> #
雲	'cloud'	ba <sup>4</sup>	ba <sup>4</sup>	ba <sup>4</sup>	ba <sup>4</sup>	ba <sup>4</sup>	ba <sup>4</sup>	-a <sup>1</sup> #
大腿	'thigh'	-ba <sup>2</sup>	-va <sup>2</sup>	-va <sup>2</sup>	-va <sup>2</sup>	-va <sup>2</sup>	-va <sup>2</sup>	-a <sup>1</sup> #

Also we will see in the following sections that, unlike initials which show a collocation restriction based on tonal series, vowels can co-occur with both tonal series and all Kra-Dai tone categories.

## 6.2. A reconstruction of Proto-Ong-Be monophthongs

### 6.2.1. Proto low vowels

#### 6.2.1.1. \*-a:

All the words given in Table 132 contains /a/, which I reconstruct as \*-a:# due to the a:a:a:a:a correspondence.

**Table 132: \*-a:#**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto-Ong-Be
魚	'fish'	ba <sup>1</sup>	ba <sup>1</sup>	ba <sup>1</sup>	ba <sup>1</sup>	ba <sup>1</sup>	ba <sup>1</sup>	*ba: A <sup>1</sup>
雲	'cloud'	ba <sup>4</sup>	ba <sup>4</sup>	ba <sup>4</sup>	ba <sup>4</sup>	ba <sup>4</sup>	ba <sup>4</sup>	*ba: BC <sup>2</sup>
大腿	'thigh'	-ba <sup>2</sup>	-va <sup>2</sup>	-va <sup>2</sup>	-va <sup>2</sup>	-va <sup>2</sup>	-va <sup>2</sup>	*va: A <sup>2</sup>

The rhymes \*-a:p and \*-a:k are preserved in all the modern Ong-Be varieties, as shown in Table 133. Parallel to the development of \*-a:# in Table 132, modern Ong-Be has /a/ as the nucleus in closed syllables. The tone in 'crow' might be a sporadic change in Proto-Ong-Be (see Table 77). Because this study does not aim to exhaust all possible rhymes in Proto-Ong-Be, reconstruction gaps like \*-a:t and \*-a:ʔ do exist.

**Table 133: \*-a:p and \*-a:k**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto-Ong-Be
蟑螂	'roach'	-lap <sup>7</sup>	-lap <sup>7</sup>	-zap <sup>7</sup>	-zap <sup>7</sup>	-lap <sup>7</sup>	-lap <sup>7</sup>	*la:p D <sup>1</sup>
挑 (擔)	'to carry on shoulder'	hap <sup>7</sup>	hap <sup>7</sup>	hap <sup>7</sup>	hap <sup>7</sup>	hap <sup>7</sup>	hap <sup>7</sup>	*ha:p D <sup>1</sup>
嘴	'mouth'	bak <sup>7</sup>	bak <sup>7</sup>	bak <sup>7</sup>	bak <sup>7</sup>	bak <sup>7</sup>	bak <sup>7</sup>	*ba:k D <sup>1</sup>
果實	'fruit'	mak <sup>8</sup>	mak <sup>8</sup>	mak <sup>8</sup>	mak <sup>8</sup>	mak <sup>8</sup>	mak <sup>8</sup>	*ma:k D <sup>2</sup>
烏鴉	'crow'	-ʔak <sup>8</sup>	-ʔak <sup>8</sup>	-ʔak <sup>8</sup>	-ʔak <sup>8</sup>	-ʔak <sup>8</sup>	-ʔak <sup>8</sup>	*ʔa:k D <sup>1</sup>

**Table 134: \*-a:m, \*-a:n, and \*-a:ŋ**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
抬	'to lift by two people'	ham <sup>1</sup>	ham <sup>1</sup>	ham <sup>1</sup>	ham <sup>1</sup>	ham <sup>1</sup>	ham <sup>1</sup>	*ha:m <sup>A1</sup>
玩	'to play'	nam <sup>1</sup>	--	--	nam <sup>1</sup>	ŋam <sup>1</sup>	zam <sup>1</sup>	*ŋa:m <sup>A1</sup>
舂 (米)	'to pound (rice)'	nam <sup>2</sup>	nam <sup>2</sup>	nam <sup>2</sup>	nam <sup>2</sup>	nam <sup>2</sup>	nam <sup>2</sup>	*na:m <sup>A2</sup>
孫	'grandchild'	lan <sup>1</sup>	lan <sup>1</sup>	lan <sup>1</sup>	lan <sup>1</sup>	lan <sup>1</sup>	lan <sup>1</sup>	*la:n <sup>A1</sup>
啼叫	'to crow'	tan <sup>1</sup>	tan <sup>1</sup>	tan <sup>1</sup>	tan <sup>1</sup>	tan <sup>1</sup>	tan <sup>1</sup>	*ta:n <sup>A1</sup>
扁擔	'shoulder pole'	ban <sup>2</sup>	van <sup>2</sup>	van <sup>2</sup>	van <sup>2</sup>	van <sup>2</sup>	van <sup>2</sup>	*va:n <sup>A2</sup>
房屋	'house'	zan <sup>2</sup>	zan <sup>2</sup>	zan <sup>2</sup>	zan <sup>2</sup>	zan <sup>2</sup>	zan <sup>2</sup>	*za:n <sup>A2</sup>
動物 脂肪	'grease'	man <sup>2</sup>	man <sup>2</sup>	man <sup>2</sup>	man <sup>2</sup>	man <sup>2</sup>	man <sup>2</sup>	*ma:n <sup>A2</sup>
沙	'sand'	taŋ <sup>1</sup>	taŋ <sup>1</sup>	taŋ <sup>1</sup>	taŋ <sup>1</sup>	taŋ <sup>1</sup>	taŋ <sup>1</sup>	*ta:ŋ <sup>A1</sup>
竹筍	'bamboo shoots'	naŋ <sup>2</sup>	naŋ <sup>2</sup>	naŋ <sup>2</sup>	naŋ <sup>2</sup>	naŋ <sup>2</sup>	naŋ <sup>2</sup>	*na:ŋ <sup>A2</sup>
斗笠、草 帽	'bamboo hat'	laŋ <sup>3</sup>	laŋ <sup>3</sup>	laŋ <sup>3</sup>	laŋ <sup>3</sup>	laŋ <sup>3</sup>	laŋ <sup>3</sup>	*la:ŋ <sup>BC1</sup>

Similar to the previous sets which regularly show the *a:a:a:a:a:a* correspondence, Table 134 consists of words possessing \*-a:- plus a nasal coda as their rhymes. Consequently, \*-a:m, \*-a:n, and \*-a:ŋ are reconstructed for this table. As we can see in Table 132, Table 133, and Table 134, the quality of Proto-Ong-Be \*a: is well preserved into its daughter languages.

All the words listed in Table 135 contain -a- followed by an off-glide -w or -j. Again, here we see regular sound correspondences that resemble those found in Table 132 - Table 134. The proto rhymes \*-a:w and \*-a:j are reconstructed accordingly.

**Table 135: \*-a:w and \*-a:j**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
下 (面)	'below'	daw <sup>2</sup>	daw <sup>2</sup>	daw <sup>2</sup>	daw <sup>2</sup>	daw <sup>2</sup>	daw <sup>2</sup>	*da:w <sup>A2</sup>
編 (辮子)	'to braid'	law <sup>3</sup>	law <sup>3</sup>	law <sup>3</sup>	law <sup>3</sup>	law <sup>3</sup>	law <sup>3</sup>	*la:w <sup>BC1</sup>
鹽	'salt'	naw <sup>3</sup>	naw <sup>3</sup>	naw <sup>3</sup>	naw <sup>3</sup>	ɲaw <sup>3</sup>	zaw <sup>3</sup>	*ɲa:w <sup>BC1</sup>
舊	'old (not new)'	kaw <sup>3</sup>	kaw <sup>3</sup>	kaw <sup>3</sup>	kaw <sup>3</sup>	kaw <sup>3</sup>	kaw <sup>3</sup>	*ka:w <sup>BC1</sup>
雄性	'male'	--	haw <sup>4</sup>	haw <sup>4</sup>	--	haw <sup>4</sup>	haw <sup>4</sup>	*ha:w <sup>BC2</sup>
新	'new'	naw <sup>4</sup>	naw <sup>4</sup>	naw <sup>4</sup>	naw <sup>4</sup>	naw <sup>4</sup>	naw <sup>4</sup>	*na:w <sup>BC2</sup>
稻	'rice in the field'	ɲaw <sup>4</sup>	ɲaw <sup>4</sup>	ɲaw <sup>4</sup>	ɲaw <sup>4</sup>	ɲaw <sup>4</sup>	ɲaw <sup>4</sup>	*ɲa:w <sup>BC2</sup>
死	'dead'	daj <sup>1</sup>	daj <sup>1</sup>	daj <sup>1</sup>	daj <sup>1</sup>	daj <sup>1</sup>	daj <sup>1</sup>	*da:j <sup>A1</sup>
乾飯	'cooked rice'	ɲaj <sup>2</sup>	ɲaj <sup>2</sup>	ɲaj <sup>2</sup>	ɲaj <sup>2</sup>	ɲaj <sup>2</sup>	ɲaj <sup>2</sup>	*ɲa:j <sup>A2</sup>
借	'to borrow'	naj <sup>3</sup>	naj <sup>3</sup>	naj <sup>3</sup>	naj <sup>3</sup>	naj <sup>3</sup>	naj <sup>3</sup>	*na:j <sup>BC1</sup>
屎	'excrement'	kaj <sup>4</sup>	kaj <sup>4</sup>	kaj <sup>4</sup>	kaj <sup>4</sup>	kaj <sup>4</sup>	kaj <sup>4</sup>	*ka:j <sup>BC2</sup>

**6.2.1.2. \*-a-**

Table 136 presents another recurrent *a:a:ɐ~a:a:a* correspondence that is similar to, yet distinct from the above tables. Among the six Ong-Be varieties, the latter three, i.e., Qiaotou, Huangtong, and Xinying, have the same /a/ reflexes found in the above-mentioned tables. By contrast, Changliu reflects this proto vowel with /a/ and Longtang with a prime tone on either /e/ or /a/. As for Yongxing, even though segmentally it has the same vowel quality seen in Table 132 - Table 134, it reflects this set with a prime tone on Tone 7, which is not attested in the tables given above. Consequently, a different proto vowel must be reconstructed for Table 136. Considering the vowel quality, \*-a- is reconstructed for this table, resulting in rhymes \*-ap, \*-at, \*-ak, and \*-aʔ.

**Table 136: \*-ap, \*-at, \*-ak, and \*-aʔ**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
睡、躺	'to sleep; to lie down'	lap <sup>7</sup>	lap <sup>7</sup>	lap <sup>7</sup>	lap <sup>7</sup>	lap <sup>7</sup>	lap <sup>7</sup>	*lap <sup>D1</sup>
頭蟲	'head louse'	kat <sup>7</sup>	kat <sup>7</sup>	kat <sup>7</sup>	kat <sup>7</sup>	kat <sup>7</sup>	kat <sup>7</sup>	*kat <sup>D1</sup>
地	'land'	mat <sup>8</sup>	mat <sup>8</sup>	met <sup>8</sup>	mat <sup>8</sup>	mat <sup>8</sup>	mat <sup>8</sup>	*mat <sup>D2</sup>
中餐	'lunch'	bak <sup>8</sup>	bak <sup>8</sup>	bək <sup>8</sup> 'break-fast'	bak <sup>8</sup>	--	bak <sup>8</sup>	*bak <sup>D2</sup>
聾	'deaf'	mak <sup>8</sup>	mak <sup>8</sup>	mək <sup>8</sup>	mak <sup>8</sup>	mak <sup>8</sup>	mak <sup>8</sup>	*mak <sup>D2</sup>
溼	'wet'	tsak <sup>8</sup>	tsak <sup>8</sup>	tsek <sup>8</sup>	tsak <sup>8</sup>	tsak <sup>8</sup>	tsak <sup>8</sup>	*tsak <sup>D2</sup>
啃	'to gnaw'	kaʔ <sup>7</sup>	--	--	kaʔ <sup>7</sup>	kaʔ <sup>7</sup>	--	*kaʔ <sup>D1</sup>
直	'straight; to stretch'	daʔ <sup>8</sup>	daʔ <sup>8</sup>	daʔ <sup>8</sup>	--	--	daʔ <sup>8</sup>	*daʔ <sup>D2</sup>
馬	'horse'	maʔ <sup>8</sup>	maʔ <sup>8</sup>	maʔ <sup>8</sup>	maʔ <sup>8</sup>	maʔ <sup>8</sup>	maʔ <sup>8</sup>	*maʔ <sup>D2</sup>
針	'needle'	ŋaʔ <sup>8</sup>	ŋaʔ <sup>8</sup>	ŋaʔ <sup>8</sup>	ŋaʔ <sup>8</sup>	ŋaʔ <sup>8</sup>	ŋaʔ <sup>8</sup>	*ŋaʔ <sup>D2</sup>

Table 137 shows an *a:a:ə~a:a:a:a* correspondence identical to that in the previous table.

While Changliu has /a/ as the reflex, /ə/ is found in Longtang, occasionally accompanied by a prime tone. The proto rhymes \*-am, \*-an, and \*-aŋ are reconstructed here (cf. those in Table 134).

**Table 137: \*-am, \*-an, and \*-aŋ**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
黑	'black'	zam <sup>1</sup>	zam <sup>1</sup>	zem <sup>1</sup>	zam <sup>1</sup>	zam <sup>1</sup>	lam <sup>1</sup>	*zam <sup>A1</sup>
苦	'bitter'	kam <sup>2</sup>	kam <sup>2</sup>	kam <sup>2</sup>	kam <sup>2</sup>	kam <sup>2</sup>	kam <sup>2</sup>	*kam <sup>A2</sup>
水	'water'	nam <sup>4</sup>	nam <sup>4</sup>	nam <sup>4</sup>	nam <sup>4</sup>	nam <sup>4</sup>	nam <sup>4</sup>	*nam <sup>BC2</sup>
風	'wind'	ban <sup>3</sup>	van <sup>3</sup>	van <sup>3</sup>	van <sup>3</sup>	van <sup>3</sup>	van <sup>3</sup>	*van <sup>BC1</sup>
肉	'meat'	nan <sup>4</sup>	nan <sup>4</sup>	nan <sup>4</sup>	nan <sup>4</sup>	nan <sup>4</sup>	nan <sup>4</sup>	*nan <sup>BC2</sup>
溝渠	'ditch'	maŋ <sup>1</sup>	maŋ <sup>1</sup>	meŋ <sup>1</sup>	maŋ <sup>1</sup>	maŋ <sup>1</sup>	maŋ <sup>1</sup>	*maŋ <sup>A1</sup>
皮膚	'skin'	naŋ <sup>1</sup>	naŋ <sup>1</sup>	neŋ <sup>1</sup>	naŋ <sup>1</sup>	naŋ <sup>1</sup>	naŋ <sup>1</sup>	*naŋ <sup>A1</sup>
鹹	'salty'	zaŋ <sup>3</sup>	zaŋ <sup>3</sup>	zaŋ <sup>3</sup>	zaŋ <sup>3</sup>	laŋ <sup>3</sup>	laŋ <sup>3</sup>	*zaŋ <sup>BC1</sup>
乾淨	'clean'	baŋ <sup>3</sup>	baŋ <sup>3</sup>	--	baŋ <sup>3</sup>	baŋ <sup>3</sup>	baŋ <sup>3</sup>	*baŋ <sup>BC1</sup>

In Table 138, Qiaotou, Huangtong, and Xinying all have /a/ as the reflex for this proto vowel, whereas Changliu has /a/ or /a/, and Longtang has /a/ or /ə/ with Tone 1'.

'Chicken' in Yongxing shows an unexpected rhyme /ɛj/, which is likely due to regressive assimilation where \*-a- was raised to -ɛ- under the influence of -j. Given the sound



correspondence, \*-aw and \*-aj are thus reconstructed (cf. Table 135 where /a/, /e/ and prime tones are not observed).

**Table 138: \*-aw and \*-aj**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
糯米	'glutinous rice'	-naw <sup>1</sup>	-naw <sup>1</sup>	-new <sup>1'</sup>	-naw <sup>1</sup>	-naw <sup>1</sup>	-naw <sup>1</sup>	*naw <sup>A1</sup>
聲音	'sound'	saw <sup>1</sup>	saw <sup>1</sup>	sew <sup>1'</sup>	saw <sup>1</sup>	saw <sup>1</sup>	saw <sup>1</sup>	*saw <sup>A1</sup>
熟	'ripe'	ŋaw <sup>3</sup>	ŋaw <sup>3</sup>	ŋaw <sup>3</sup>	ŋaw <sup>3</sup>	ŋaw <sup>3</sup>	ŋaw <sup>3</sup>	*ŋaw <sup>BC1</sup>
吠叫	'to bark'	saw <sup>3</sup>	saw <sup>3</sup>	saw <sup>3</sup>	saw <sup>3</sup>	saw <sup>3</sup>	saw <sup>3</sup>	*saw <sup>BC1</sup>
角	'horn'	baw <sup>2</sup>	vaw <sup>2</sup>	vaw <sup>2</sup>	vaw <sup>2</sup>	vaw <sup>2</sup>	vaw <sup>2</sup>	*vaw <sup>A2</sup>
黃蜂	'wasp'	ɬaw <sup>4</sup>	ɬaw <sup>4</sup>	ɬaw <sup>4</sup>	ɬaw <sup>4</sup>	ɬaw <sup>4</sup>	ɬaw <sup>4</sup>	*ɬaw <sup>BC2</sup>
雞	'chicken'	kaj <sup>1</sup>	kej <sup>1</sup>	kej <sup>1'</sup>	kaj <sup>1</sup>	kaj <sup>1</sup>	kaj <sup>1</sup>	*kaj <sup>A1</sup>
月亮	'moon'	saj <sup>1</sup>	saj <sup>1</sup>	-sej <sup>1'</sup>	saj <sup>1</sup>	-saj <sup>1</sup>	-saj <sup>1</sup>	*saj <sup>A1</sup>
哭	'to cry'	ŋaj <sup>3</sup>	ŋaj <sup>3</sup>	ŋaj <sup>3</sup>	ŋaj <sup>3</sup>	ŋaj <sup>3</sup>	ŋaj <sup>3</sup>	*ŋaj <sup>BC1</sup>

As can be seen in Table 132 - Table 138, the earlier vowel length distinction has been lost in modern Ong-Be. Nevertheless, the quality of \*a: is well kept in today's Ong-Be. On the other hand, \*a tends to be reflected with a different vowel quality in contemporary eastern Ong-Be varieties, such as Changliu and Longtang, while prime tones are occasionally attested in Yongxing and Longtang.

## 6.2.2. Proto high vowels

### 6.2.2.1. \*-i:

All the examples given in Table 139 contain *-i-* as their nuclei. Parallel to our reconstruction of \*a:, \*i: is reconstructed here (cf. Table 143). As a result, two rhymes, \*-i:t and \*-i:k, are reconstructed. As for \*-i:ʔ, it shows the same sound correspondence, parallel with which is found with \*-i:t and \*-i:k. However, it is tentatively reconstructed because it is non-recurrent and only has evidence from Eastern Ong-Be.

**Table 139: \*-i:t, \*-i:k, and \*-i:ʔ**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
冷	'cold'	nit <sup>7</sup>	nit <sup>7</sup>	nit <sup>7</sup>	nit <sup>7</sup>	nit <sup>7</sup>	nit <sup>7</sup>	*ni:t <sup>D1</sup>
打	'to hit'	kit <sup>7</sup>	kit <sup>7</sup>	kit <sup>7</sup>	kit <sup>7</sup>	kit <sup>7</sup>	kit <sup>7</sup>	*ki:t <sup>D1</sup>
刀子	'knife'	mit <sup>8</sup>	mit <sup>8</sup>	mit <sup>8</sup>	mit <sup>8</sup>	mit <sup>8</sup>	mit <sup>8</sup>	*mi:t <sup>D2</sup>
翅膀	'wing'	bik <sup>7</sup>	bik <sup>7</sup>	bik <sup>7</sup>	bik <sup>7</sup>	bik <sup>7</sup>	bik <sup>7</sup>	*bi:k <sup>D1</sup>
滿	'full'	dik <sup>7</sup>	dik <sup>7</sup>	dɪt <sup>7</sup> -f	dik <sup>7</sup>	dik <sup>7</sup>	dik <sup>7</sup>	*di:k <sup>D1</sup>
小	'small; little'	niʔ <sup>7</sup>	niʔ <sup>7</sup>	ni <sup>7</sup>	niʔ <sup>7</sup>	--	--	*ni:ʔ <sup>D1</sup>

Table 140 serves to illustrate that regular segmental correspondences play an important role in vowel reconstruction when tones provide no clue to an earlier vowel quantity. For example, the first five lexical items (from 'sickle' to 'tongue') show no sign of prime tones. If such a split is decisive in reconstructing the proto vowel, it is not possible to decide whether a long or short vowel should be reconstructed. For the last two items, Longtang suggests that at the time of the tonal split, it was a short vowel. Notwithstanding the suprasegmental features, the *i:i:i:i:i* correspondence exhibits a parallel development to that of \*a: in which the quality of a proto long vowel has remained intact in modern varieties. For this reason, \*-i:m, \*-i:n, and \*-i:ŋ are reconstructed.

**Table 140: \*-i:m, \*-i:n, and \*-i:ŋ**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
鐮刀	'sickle'	lim <sup>2</sup>	--	--	lim <sup>2</sup>	lim <sup>2</sup>	lim <sup>2</sup>	*li:m <sup>A2</sup>
舔	'to lick'	--	lim <sup>4</sup>	zim <sup>4</sup> -i	lim <sup>4</sup>	lim <sup>4</sup>	lim <sup>4</sup>	*li:m <sup>BC2</sup>
石	'stone'	din <sup>2</sup>	din <sup>2</sup>	din <sup>2</sup>	din <sup>2</sup>	din <sup>2</sup>	din <sup>2</sup>	*di:n <sup>A2</sup>
魚鉤	'fish hook'	tin <sup>3</sup>	tin <sup>3</sup>	tin <sup>3</sup>	tin <sup>3</sup>	tin <sup>3</sup>	tin <sup>3</sup>	*ti:n <sup>BC1</sup>
舌頭	'tongue'	lin <sup>4</sup>	lin <sup>4</sup>	lin <sup>4</sup>	lin <sup>4</sup>	lin <sup>4</sup>	lin <sup>4</sup>	*li:n <sup>BC2</sup>
螞蝗	'land leech'	biŋ <sup>1</sup>	biŋ <sup>1</sup>	biŋ <sup>1</sup>	biŋ <sup>1</sup>	biŋ <sup>1</sup>	biŋ <sup>1</sup>	*bi:ŋ <sup>A1</sup>
穿	'to wear'	dŋ <sup>1</sup>	dŋ <sup>1</sup>	dŋ <sup>1</sup>	dŋ <sup>1</sup>	dŋ <sup>1</sup>	dŋ <sup>1</sup>	*di:ŋ <sup>A1</sup>

The rhyme \*-i:w is reconstructed for Table 141 for it shows a regular correspondence that resembles the previous two tables.

**Table 141: \*-i:w**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
聞	'to smell'	niw <sup>3</sup>	niw <sup>3</sup>	niw <sup>3</sup>	niw <sup>3</sup>	ɲiw <sup>3</sup>	--	*ni:w BC1
雞冠	'cockscorn'	tiw <sup>3</sup>	tiw <sup>3</sup>	tiw <sup>3</sup>	tiw <sup>3</sup>	tiw <sup>3</sup>	tiw <sup>3</sup>	*ti:w BC1
蓆子	'bamboo mat'	ziw <sup>4</sup>	ziw <sup>4</sup>	ziw <sup>4</sup>	ziw <sup>4</sup>	liw <sup>4</sup>	liw <sup>4</sup>	*zi:w BC2
提	'to hand-carry'	--	ɖiw <sup>4</sup>	--	ɖiw <sup>4</sup>	ɖiw <sup>4</sup>	ɖiw <sup>4</sup>	*ɖi:w BC2

**6.2.2.2. \*-i-**

Table 142 introduces another correspondence set where Xinying, Huangtong, and Qiaotou have /i/ in contrast with Longtang, Yongxing, and Changliu where a high vowel is only seen before a velar coda. One might wonder if a central vowel is needed when modern reflexes show opposite vowel heights. The word 'to fly' in Yongxing and Longtang provides convincing evidence that this rhyme once contained \*-i- because \*v- in Yongxing and Longtang becomes ɸ- only before -i-, cf. 'shoulder', 'to buy', and 'thin' in Table 183 and Table 185. In addition, this lexical item reveals a relative chronology in which \*v- became ɸ- before the quality of \*-i- shifted. Two rhymes, \*-in and \*-inɣ, are reconstructed accordingly. We see that before a velar coda, /i/ is kept in Changliu and Yongxing, and in Longtang the frontness of the vowel is preserved via /ɛ/. Note that \*-im is not found in my data.

**Table 142: \*-in and \*-inɣ**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
牙齒	'tooth'	tɔn <sup>1</sup>	tɔn <sup>1</sup>	tɛn <sup>1</sup>	tɛn <sup>1</sup>	tin <sup>1</sup>	tin <sup>1</sup>	*tin A1
飛	'to fly'	ɸan <sup>1</sup>	ɸɔn <sup>1</sup>	ɸɛn <sup>1</sup>	vin <sup>1</sup>	vin <sup>1</sup>	vin <sup>1</sup>	*vin A1
穿山甲	'pangolin'	han <sup>4</sup>	hɔn <sup>4</sup>	hɛn <sup>4</sup>	hɛn <sup>4</sup>	hin <sup>4</sup>	hin <sup>4</sup>	*hin BC2
蟲	'worm; bug'	min <sup>2</sup>	min <sup>2</sup>	mɛn <sup>2</sup>	min <sup>2</sup>	min <sup>2</sup>	min <sup>2</sup>	*min A2
賣	'to sell'	ɣin <sup>3</sup>	ɣin <sup>3</sup>	ɣɛn <sup>3</sup>	ɣin <sup>3</sup>	ɣin <sup>3</sup>	ɣin <sup>3</sup>	*ɣin BC1

A similar vowel correspondence to that of Table 142 is found in Table 143. For this reason, I reconstruct \*-ip, \*-it, \*-ik, and \*-iʔ here. As observed in the above table, the frontness of \*-i- is kept in Changliu and Yongxing only before a velar coda, as in 'to peel'

and ‘fish scales’, but it has been lowered to /ɛ/ in Longtang. \*-ik is reconstructed tentatively because it is non-recurrent and is reflected only in Eastern Ong-Be, although the development of its reflex is parallel to \*-iŋ. Also due to lack of witnesses from Western Ong-Be, it remains unclear whether the proto initial of ‘to peel’ is \*z- or \*ʑ-.

**Table 143: \*-ip, \*-it, \*-ik, and \*-iʔ**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong- Be
生	‘raw’	zɔp <sup>7</sup>	zɔp <sup>7</sup>	zɔp <sup>7</sup>	ʑɔp <sup>7</sup>	ʑip <sup>7</sup>	lip <sup>7</sup>	*zip <sup>D1</sup>
蜈蚣	‘centipede’	zɔp <sup>8</sup>	zɔp <sup>8</sup>	zɛp <sup>8</sup>	ʑɔp <sup>8</sup>	ʑip <sup>8</sup>	lip <sup>8</sup>	*zip <sup>D2</sup>
一	‘one’	ʔɔt <sup>7</sup>	ʔɔt <sup>7</sup>	ʔɔt <sup>7</sup>	ʔɛt <sup>7</sup>	ʔit <sup>7</sup>	ʔit <sup>7</sup>	*ʔit <sup>D1</sup>
星星、茄 子、冰雹	‘star; eggplant; hail’	-hat <sup>7</sup>	-hat <sup>7</sup>	-k <sup>h</sup> ɔt <sup>7</sup> -i	-hət <sup>7</sup> ‘eggplant’	-hit <sup>7</sup> ‘hail’	-hit <sup>7</sup> ‘hail’	*hit <sup>D1</sup>
香菇	‘mushroom’	lot <sup>8</sup> ; hot <sup>8</sup> (XIN)	hot <sup>8</sup>	hat <sup>8</sup>	hət <sup>8</sup>	hit <sup>8</sup>	hit <sup>8</sup>	*hit <sup>D2</sup>
剥皮	‘to peel’	zik <sup>8</sup>	zik <sup>8</sup>	zɛk <sup>8</sup>	--	--	--	*-ik <sup>D2</sup>
魚鱗	‘fish scale’	luʔ <sup>7</sup>	liʔ <sup>7</sup>	liʔ <sup>7</sup>	liʔ <sup>8</sup> -t	liʔ <sup>7</sup>	liʔ <sup>7</sup>	*liʔ <sup>D1</sup>

### 6.2.2.3. \*-u:

Table 144 is composed of words containing -u- throughout the selected varieties. Based on the principle I proposed earlier that proto long vowels have hitherto survived in terms of quality, \*-u:- is the optimal candidate for this correspondence set. The rhymes, \*-u:p, \*-u:t, \*-u:k, and \*-u:ʔ, are reconstructed accordingly.

**Table 144: \*-u:p, \*-u:t, \*-u:k, and \*-u:ʔ**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong- Be
冬瓜	‘winter melon’	-kup <sup>7</sup>	-kup <sup>7</sup>	-kup <sup>7</sup>	-kup <sup>7</sup>	-kup <sup>7</sup>	--	*ku:p <sup>D1</sup>
燒 (稻草)	‘to burn (straw)’	--	zut <sup>7</sup>	zut <sup>7</sup>	ʑut <sup>7</sup>	ʑut <sup>8</sup> -t	lut <sup>7</sup>	*zu:t <sup>D1</sup>
繭	‘cocoon’	luk <sup>7</sup>	luk <sup>7</sup>	luk <sup>7</sup>	--	luk <sup>7</sup> (LC)	--	*lu:k <sup>D1</sup>
芽	‘sprout’	ŋuk <sup>8</sup>	ŋuk <sup>8</sup>	ŋuk <sup>8</sup>	--	--	--	*ŋu:k <sup>D2</sup>
外 (面)	‘outside’	ʔuk <sup>7</sup>	ʔik <sup>7</sup> -v	ʔok <sup>7</sup>	ʔuk <sup>7</sup>	ʔuk <sup>7</sup>	ʔuk <sup>7</sup>	*ʔu:k <sup>D1</sup>
窩、巢	‘nest’	zuk <sup>8</sup>	zuk <sup>8</sup>	zok <sup>8</sup>	ʑuk <sup>8</sup>	luk <sup>8</sup>	luk <sup>8</sup>	*zu:k <sup>D2</sup>
尾巴	‘tail’	tuʔ <sup>7</sup>	tuʔ <sup>7</sup>	tuʔ <sup>7</sup>	tuʔ <sup>8</sup> -t	tuʔ <sup>7</sup>	tuʔ <sup>7</sup>	*tu:ʔ <sup>D1</sup>
螞蟻	‘ant’	muʔ <sup>8</sup>	muʔ <sup>8</sup>	moʔ <sup>8</sup>	muʔ <sup>8</sup>	muʔ <sup>8</sup>	muʔ <sup>8</sup>	*mu:ʔ <sup>D2</sup>

Table 145 presents an *u:u:u:u:u:u* correspondence identical to that observed above.

Proto rhymes \*-u:m, \*-u:n, and \*-u:ŋ are therefore reconstructed. In this table, ‘beard’ is idiosyncratic in Changliu, Yongxing and Longtang in which, I propose that /m/ became /ŋ/ under the influence of \*-u:-, cf. Proto-Tai ‘beard’ \*mum<sup>B2</sup> (F. Li 1977) or \*mom<sup>B</sup> (Pittayaporn 2009), Proto-Kra \*mum<sup>C</sup>, and Proto-Hlai \*(ə)mɪ:m<sup>C</sup> (Ostapirat 2004) or \*hmw:m<sup>?</sup> (Norquest 2007).<sup>76</sup>

**Table 145: \*-u:m, \*-u:n, and \*-u:ŋ**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
瘦	‘slim’	sum <sup>1</sup>	sum <sup>1</sup>	sum <sup>1</sup>	sum <sup>1</sup>	sum <sup>1</sup>	sum <sup>1</sup>	*su:m <sup>A1</sup>
鬍子	‘beard’	mun <sup>4</sup> -f	ŋum <sup>4</sup> -i	mon <sup>4</sup> -f	mum <sup>4</sup>	mum <sup>4</sup>	mum <sup>4</sup>	*mu:m <sup>BC2</sup>
站	‘to stand’	zun <sup>1</sup>	zun <sup>1</sup>	zun <sup>1</sup>	nun <sup>1</sup>	ŋun <sup>1</sup>	zun <sup>1</sup>	*zu:n <sup>A1</sup>
桑葉	‘mulberry leaf’	-bun <sup>2</sup>	-bun <sup>2</sup>	-bun <sup>2</sup>	-bun <sup>2</sup>	-bun <sup>2</sup>	--	*bu:n <sup>A2</sup>
年紀輕	‘young’	ʔun <sup>3</sup>	ʔun <sup>3</sup>	ʔun <sup>3</sup>	ʔun <sup>3</sup>	ʔun <sup>3</sup>	ʔun <sup>3</sup>	*ʔu:n <sup>BC1</sup>
熱	‘hot; to heat’	lun <sup>3</sup>	lun <sup>3</sup>	lun <sup>3</sup>	lun <sup>3</sup>	lun <sup>3</sup>	lun <sup>3</sup>	*lu:n <sup>BC1</sup>
稻草	‘straw’	mun <sup>4</sup>	mun <sup>4</sup>	mun <sup>4</sup>	mun <sup>4</sup>	mun <sup>4</sup>	mun <sup>4</sup>	*mu:ŋ <sup>BC2</sup>
蝌蚪	‘tadpole’	-dun <sup>1</sup>	-dun <sup>1</sup>	-don <sup>1</sup>	-dun <sup>1</sup>	-dun <sup>1</sup>	--	*du:ŋ <sup>A1</sup>
上(面)	‘above’	zon <sup>1</sup>	zun <sup>1</sup>	zun <sup>1</sup>	zun <sup>1</sup>	--	lon <sup>1</sup>	*zu:ŋ <sup>A1</sup>

The rhyme \*-u:j is reconstructed, given the recurrent *u:u:u:u:u:u* correspondence. The irregular initial correspondence (*m:m:m:ŋ:ŋ:ŋ*) of ‘shadow’ does not influence my reconstruction of this proto rhyme.

**Table 146: \*-u:j**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
影子	‘shadow’	muj <sup>1</sup>	muj <sup>1</sup>	muj <sup>1</sup>	ŋuj <sup>1</sup>	ŋuj <sup>1</sup>	ŋuj <sup>1</sup>	*-u:j <sup>A1</sup>
肥胖	‘chubby’	p <sup>h</sup> oj <sup>2</sup>	--	p <sup>h</sup> uj <sup>2</sup>	fuj <sup>2</sup>	fuj <sup>2</sup>	p <sup>h</sup> uj <sup>2</sup>	*p <sup>h</sup> u:j <sup>A2</sup>
碗	‘bowl’	hoj <sup>4</sup>	huj <sup>4</sup>	huj <sup>4</sup>	huj <sup>4</sup>	huj <sup>4</sup>	huj <sup>4</sup>	*hu:j <sup>BC2</sup>

<sup>76</sup> Without referring to a sister language of Ong-Be, it is impossible to tell if the proto coda is /m/ and /ŋ/, given that Western Ong-Be has /m/ whereas Eastern Ong-Be has /ŋ/.

#### 6.2.2.4. \*-u-

Another correspondence set is given in Table 147 in which Qiaotou, Huangtong, and Xinying reflect the proto vowel in a way identical to that in Table 144. On the other hand, Yongxing and Longtang have reflexes distinct from those observed above. The proto short vowel \*-u- is therefore chosen for this set, rendering the tentative reconstruction of \*-ut.

**Table 147: \*-ut**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
屁	'fart'	ɗut <sup>7</sup>	ɗot <sup>7</sup>	ɗot <sup>7</sup>	ɗut <sup>7</sup>	ɗut <sup>7</sup>	ɗut <sup>7</sup>	*ɗut <sup>D1</sup>

The rhymes \*-um and \*-un are reconstructed here because Table 148 demonstrates the same correspondence pattern found in Table 147.

**Table 148: \*-um and \*-un**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
撿	'to pick up'	hɔm <sup>1</sup>	hɔm <sup>1</sup>	hem <sup>1</sup>	hum <sup>1</sup>	hum <sup>1</sup>	hum <sup>1</sup>	*hum <sup>A1</sup>
蛋	'egg'	nɔm <sup>1</sup>	nam <sup>1</sup>	nem <sup>1</sup>	num <sup>1</sup>	ɲum <sup>1</sup>	zum <sup>1</sup>	*ɲum <sup>A1</sup>
癢	'itchy'	kɔm <sup>2</sup>	kɔm <sup>2</sup>	kɔm <sup>2</sup>	kum <sup>2</sup>	kum <sup>2</sup>	kum <sup>2</sup>	*kum <sup>A2</sup>
蟹	'crab'	kʰɔm <sup>2</sup>	kʰɔm <sup>2</sup>	kʰɔm <sup>2</sup>	xum <sup>2</sup>	xum <sup>2</sup>	kʰum <sup>2</sup>	*kʰum <sup>A2</sup>
雨	'rain'	pʰan <sup>1</sup>	pʰɔn <sup>1</sup>	pʰen <sup>1</sup>	fun <sup>1</sup>	fun <sup>1</sup>	pʰun <sup>1</sup>	*pʰun <sup>A1</sup>
路	'road'	sɔn <sup>1</sup>	sɔn <sup>1</sup>	sen <sup>1</sup>	sun <sup>1</sup>	sun <sup>1</sup>	sun <sup>1</sup>	*sun <sup>A1</sup>
毛	'fur'	bɔn <sup>2</sup>	vɔn <sup>2</sup>	vɔn <sup>2</sup>	vun <sup>2</sup>	vun <sup>2</sup>	vun <sup>2</sup>	*vun <sup>A2</sup>
樹	'tree'	ɗɔn <sup>3</sup>	ɗɔn <sup>3</sup>	ɗɔn <sup>3</sup>	ɗun <sup>3</sup>	ɗun <sup>3</sup>	ɗun <sup>3</sup>	*ɗun <sup>BC1</sup>

#### 6.2.3. Proto mid vowels

##### 6.2.3.1. \*-o:

In Table 149 both words show the o:o:o:o:o sound correspondence. I reconstruct this set as containing \*-o:ʃ.

**Table 149: \*-o:ʃ**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
湯	'soup'	ho <sup>3</sup>	so <sup>3</sup>	so <sup>3</sup>	so <sup>3</sup>	so <sup>3</sup>	so <sup>3</sup>	*so: BC1
褲子	'pants'	kʰo <sup>3</sup>	kʰo <sup>3</sup>	kʰo <sup>3</sup>	xo <sup>3</sup>	xo <sup>3</sup>	kʰo <sup>3</sup>	*kʰo: BC1

Table 150 shows another sound correspondence. In the beginning, besides /ɔ/, Longtang reflects this proto vowel as /a/ and /ɛ/, which is similar to the attested reflexes of \*a. Nevertheless, Qiaotou, Huangtong, and Xinying employ different vowels here, cf. \*-ap in Table 136. It seems reasonable to assign \*-o:p to this correspondence set.

**Table 150: \*-o:p (Initial reconstruction, revised in later sections)**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
啞	'mute'	ŋop <sup>7</sup>	ŋɔp <sup>7</sup>	ŋɔp <sup>7</sup> (L&Z)	ŋop <sup>7</sup>	ŋop <sup>7</sup>	ŋop <sup>7</sup>	*ŋo:p D1
剁	'to chop'	tsɔp <sup>7</sup>	tsɔp <sup>7</sup>	tsap <sup>7</sup>	--	--	--	*tso:p D1
大青蛙	'big frog'	kɔp <sup>8</sup>	kɔp <sup>8</sup>	kɛp <sup>8</sup>	ʔop <sup>8</sup>	ʔop <sup>8</sup>	ʔop <sup>8</sup>	*ko:p D2

The rhyme \*-o:t is tentatively reconstructed based on one token. Its nucleus has the identical correspondence we see in 'soup' and 'pants'. Note that 'zongzi' is a cultural item.

**Table 151: \*-o:t**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
粽子	'zongzi'	ʔot <sup>7</sup>	ʔot <sup>7</sup>	ʔot <sup>7</sup>	ʔot <sup>7</sup>	ʔot <sup>7</sup>	ʔot <sup>7</sup>	*ʔo:t D1

Here we see an *ua:o:o:o:o:o* correspondence unattested elsewhere. Either \*ua or \*o: can be reconstructed. We will see in a later section that \*ua is better reserved for another correspondence set (cf. Table 187 - Table 189). I thus reconstruct \*o:k for Table 152 and propose that diphthongization took place in Changliu before \*-k.

**Table 152: \*-o:k (Initial reconstruction, revised in later sections)**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto-Ong-Be
胸膛	‘chest’	-ʔuak <sup>7</sup>	-ʔɔk <sup>7</sup>	-ʔɔk <sup>7</sup>	-ʔɔk <sup>7</sup>	-ʔɔk <sup>7</sup>	ʔɔk <sup>7</sup>	*ʔo:k <sup>D1</sup>
鳥	‘bird’	nuak <sup>8</sup>	nok <sup>8</sup>	nok <sup>8</sup>	nok <sup>8</sup>	nok <sup>8</sup>	nok <sup>8</sup>	*no:k <sup>D2</sup>
鹿	‘deer’	tsuak <sup>8</sup>	tsok <sup>8</sup>	ts <sup>(h)</sup> ok <sup>8</sup>	tsok <sup>8</sup>	tsok <sup>8</sup>	tsok <sup>8</sup>	*tso:k <sup>D2</sup>
拔 (草)	‘to pull (weeds)’	--	vok <sup>8</sup>	vok <sup>8</sup>	vok <sup>8</sup>	vok <sup>8</sup>	--	*vo:k <sup>D2</sup>
石臼	‘mortar’	huak <sup>8</sup>	--	hok <sup>8</sup>	hok <sup>8</sup>	hok <sup>8</sup>	hok <sup>8</sup>	*ho:k <sup>D2</sup>
柚子	‘pomelo’	-ŋuak <sup>8</sup>	-ŋok <sup>8</sup>	-ŋok <sup>8</sup>	-ŋok <sup>8</sup>	-ŋok <sup>8</sup>	-ŋok <sup>8</sup>	*ŋo:k <sup>D2</sup>

Table 153 consists of only one token which I tentatively reconstruct as \*-o:ʔ.

**Table 153: \*-o:ʔ (Initial reconstruction, revised in later sections)**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto-Ong-Be
臭	‘stinky’	kɔʔ <sup>8</sup>	koʔ <sup>8</sup>	koʔ <sup>8</sup>	koʔ <sup>8</sup>	kɔʔ <sup>8</sup>	kɔʔ <sup>8</sup>	*ko:ʔ <sup>D2</sup>

The reconstructed rhyme \*-o:m is assigned to Table 154, considering that modern Ong-Be reflects this proto vowel as -o- or -ɔ-, both of which are mid back rounded vowels.

**Table 154: \*-o:m (Initial reconstruction, revised in later sections)**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto-Ong-Be
度 (兩臂 伸長的長 度)	‘the length of two stretched arms’	tom <sup>1</sup>	tom <sup>1</sup>	tom <sup>35</sup> -t	tɔm <sup>1</sup>	tɔm <sup>1</sup>	tɔm <sup>1</sup>	*to:m <sup>A1</sup>
種 (稻)	‘to plant’	zom <sup>1</sup>	zom <sup>1</sup>	zom <sup>1</sup>	zɔm <sup>1</sup>	lɔm <sup>1</sup>	lɔm <sup>1</sup>	*zo:m <sup>A1</sup>
矮、低	‘short; low’	dom <sup>3</sup>	dom <sup>3</sup>	dom <sup>3</sup>	dɔm <sup>3</sup>	dɔm <sup>3</sup>	dɔm <sup>3</sup>	*do:m <sup>BC1</sup>

The rhyme \*-o:n is tentatively reconstructed for Table 155, since all contemporary Ong-Be varieties reflect this rhyme as -on which is identical to the vowel correspondence in Table 149.

**Table 155: \*-o:n**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto-Ong-Be
閹	‘to castrate’	don <sup>1</sup>	don <sup>1</sup>	don <sup>1</sup>	don <sup>1</sup>	don <sup>1</sup>	don <sup>1</sup>	*do:n <sup>A1</sup>

Because most Ong-Be varieties reflect this proto rhyme as -oŋ, and because so far we have seen that the quality of proto long vowels is more likely to be maintained, I reconstruct \*-o:ŋ for Table 156.



**Table 156: \*-o:ŋ (Initial reconstruction, revised in later sections)**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
肺	'lung'	boŋ <sup>2</sup>	voŋ <sup>2</sup>	voŋ <sup>2</sup>	vuŋ <sup>2</sup>	voŋ <sup>2</sup>	voŋ <sup>2</sup>	*vo:ŋ <sup>A2</sup>
泥 (土)	'mud'	boŋ <sup>2</sup>	boŋ <sup>2</sup>	boŋ <sup>2</sup>	buŋ <sup>2</sup>	boŋ <sup>2</sup>	boŋ <sup>2</sup>	*bo:ŋ <sup>A2</sup>
下 (山)	'to descend'	zoŋ <sup>2</sup>	zoŋ <sup>2</sup>	zoŋ <sup>2</sup>	zuŋ <sup>2</sup>	zoŋ <sup>2</sup>	loŋ <sup>2</sup>	*zo:ŋ <sup>A2</sup>
送	'to give away'	hoŋ <sup>3</sup>	hoŋ <sup>3</sup>	hoŋ <sup>3</sup>	huŋ <sup>3</sup>	hoŋ <sup>3</sup>	hoŋ <sup>3</sup>	*ho:ŋ <sup>BC1</sup>
弟	'younger brother'	noŋ <sup>4</sup>	noŋ <sup>4</sup>	noŋ <sup>4</sup>	nuŋ <sup>4</sup>	nuŋ <sup>4</sup> (LC)	--	*no:ŋ <sup>BC2</sup>

Given the characteristics of the reflexes of proto long vowels, \*-o:j is tentatively reconstructed for Proto-Ong-Be. Note that this is an early Chinese loan presumably predates the branching of Proto-Ong-Be (cf. Middle Chinese: \*xupi 'lime').

**Table 157: \*-o:j**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
石灰	'lime'	hoj <sup>1</sup>	hoj <sup>1</sup>	hoj <sup>1</sup>	hoj <sup>1</sup>	hoj <sup>1</sup>	hoj <sup>1</sup>	*ho:j <sup>A1</sup>

#### 6.2.3.2. \*-o-

In Table 158 Qiaotou, Huangtong, and Xinying have an ɔ:ɔ:ɔ correspondence similar to that found in \*-o:- (o:o:o). By contrast, Changliu, Yongxing, and Longtang have the same correspondence (a:a:ə) observed in \*-a-. A new proto rhyme, \*-op, is therefore reconstructed here.

**Table 158: \*-op (Initial reconstruction, revised in later sections)**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
布	'cloth'	hap <sup>8</sup>	hap <sup>8</sup>	hep <sup>8</sup>	hɔp <sup>8</sup>	hɔp <sup>8</sup>	hɔp <sup>8</sup>	*hop <sup>D2</sup>
米	'husked rice'	zap <sup>8</sup>	zap <sup>8</sup>	zep <sup>8</sup>	zɔp <sup>8</sup>	zɔp <sup>8</sup>	lɔp <sup>8</sup>	*zop <sup>D2</sup>

The proto rhyme \*-ot is reconstructed for Table 159, cf. \*-o:t where all Ong-Be varieties reflect that rhyme as -ot. 'Swollen' in Longtang shall be considered a sporadic change.

**Table 159: \*-ot (Initial reconstruction, revised in later sections)**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
草	'grass'	bat <sup>7</sup>	bat <sup>7</sup>	bat <sup>7</sup>	bat <sup>7</sup>	bat <sup>7</sup>	bat <sup>7</sup>	*bat <sup>D1</sup>
腫	'swollen'	kat <sup>8</sup>	kat <sup>8</sup>	kuat <sup>8</sup> -v	kat <sup>8</sup>	kat <sup>8</sup>	kat <sup>8</sup>	*kat <sup>D2</sup>

Considering that modern Ong-Be has a mid-back rounded vowel, \*-ok is reconstructed for Table 160 (cf. \*-o:k where Changliu shows diphthongization not observed here).

**Table 160: \*-ok (Initial reconstruction, revised in later sections)**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
踩	'to step on'	ɖok <sup>7</sup>	ɖok <sup>7</sup>	ɖok <sup>7</sup>	ɖok <sup>7</sup>	--	--	*ɖok <sup>D1</sup>
癩蛤蟆	'toad'	-k <sup>h</sup> ok <sup>7</sup>	-k <sup>h</sup> ok <sup>7</sup>	-k <sup>h</sup> ok <sup>7</sup>	--	-xok <sup>7</sup>	--	*k <sup>h</sup> ok <sup>D1</sup>
貴	'expensive'	k <sup>h</sup> ok <sup>8</sup>	k <sup>h</sup> ok <sup>8</sup>	k <sup>h</sup> ok <sup>8</sup>	k <sup>h</sup> ok <sup>8</sup>	xok <sup>8</sup>	k <sup>h</sup> ok <sup>8</sup>	*k <sup>h</sup> ok <sup>D2</sup>
偷	'to steal'	zok <sup>8</sup>	zok <sup>8</sup>	zok <sup>8</sup>	zok <sup>8</sup>	lok <sup>8</sup>	lok <sup>8</sup>	*zok <sup>D2</sup>

Words listed in Table 161 and Table 162 have the ɔ:ɔ:ɔ:ɔ:ɔ correspondence. Two rhymes, \*-on and \*-onɣ, are reconstructed.

**Table 161: \*-on (Initial reconstruction, revised in later sections)**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
吃	'to eat'	kɔn <sup>1</sup>	kɔn <sup>1</sup>	kɔn <sup>1</sup>	kɔn <sup>1</sup>	kɔn <sup>1</sup>	kɔn <sup>1</sup>	*kɔn <sup>A1</sup>
互相	'each other; mutual'	kɔn <sup>2</sup>	kɔn <sup>2</sup>	kɔn <sup>2</sup>	kɔn <sup>2</sup>	kɔn <sup>2</sup>	kɔn <sup>2</sup>	*kɔn <sup>A2</sup>

**Table 162: \*-onɣ (Initial reconstruction, revised in later sections)**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
緊	'tight'	kɔŋ <sup>1</sup>	kɔŋ <sup>1</sup>	kɔŋ <sup>1</sup>	kɔŋ <sup>2</sup>	--	kɔŋ <sup>1</sup>	*kɔŋ <sup>A1</sup>
到 (達)	'to arrive'	ɖɔŋ <sup>1</sup>	ɖɔŋ <sup>1</sup>	ɖɔŋ <sup>1</sup>	ɖɔŋ <sup>1</sup>	ɖɔŋ <sup>1</sup>	ɖɔŋ <sup>1</sup>	*ɖɔŋ <sup>A1</sup>
芝麻	'sesame'	-bɔŋ <sup>2</sup>	-vɔŋ <sup>2</sup>	-vɔŋ <sup>2</sup>	-vɔŋ <sup>2</sup>	-vɔŋ <sup>2</sup>	-vɔŋ <sup>2</sup>	*vɔŋ <sup>A2</sup>
篩子	'winnowing basket'	zɔŋ <sup>2</sup>	zɔŋ <sup>2</sup>	zɔŋ <sup>2</sup>	zɔŋ <sup>2</sup>	lɔŋ <sup>2</sup>	lɔŋ <sup>2</sup>	*zɔŋ <sup>A2</sup>

Even though \*-o:w has not been reconstructed, in my system \*-o:- is never reflected as /ɐ/ in Longtang in Tone 1. Because Longtang has /ɐ/ in Tone 1 and /ɔ/ elsewhere, I reconstruct \*-ow and \*-oj for Table 163 and Table 164 respectively.

**Table 163: \*-ow (Initial reconstruction, revised in later sections)**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
拿	'to hold'	ɳow <sup>1</sup>	ɳow <sup>1</sup>	ɳɔ <sup>1</sup>	ɳow <sup>1</sup>	ɳow <sup>1</sup>	--	*ɳow <sup>A1</sup>
尿	'urine'	zow <sup>1</sup>	zow <sup>1</sup>	zɛw <sup>1</sup>	zow <sup>1</sup>	zow <sup>1</sup>	low <sup>1</sup>	*zow <sup>A1</sup>
炒菜鍋	'cooking pot'	ɖow <sup>1</sup>	ɖow <sup>1</sup>	ɖɛw <sup>1</sup>	ɖow <sup>1</sup>	ɖow <sup>1</sup>	ɖow <sup>1</sup>	*ɖow <sup>A1</sup>
柱子	'pillar'	--	hɔw <sup>1</sup>	hɛw <sup>1</sup>	hɔw <sup>1</sup>	hɔw <sup>1</sup>	hɔw <sup>1</sup>	*hɔw <sup>A1</sup>
腰	'waist'	lo <sup>3</sup>	low <sup>3</sup>	low <sup>3</sup>	low <sup>3</sup>	low <sup>3</sup>	low <sup>3</sup>	*low <sup>BC1</sup>
活	'alive'	zow <sup>3</sup>	zow <sup>3</sup>	zow <sup>3</sup>	zow <sup>3</sup>	zow <sup>3</sup>	zow <sup>3</sup>	*zow <sup>BC1</sup>
龜	'turtle'	--	--	ɖow <sup>3</sup>	ɖow <sup>3</sup>	ɖow <sup>3</sup>	ɖow <sup>3</sup>	*ɖow <sup>BC1</sup>

**Table 164: \*-oj (Initial reconstruction, revised in later sections)**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
去、走	'to walk; to go'	bɛj <sup>1</sup> -v	bɛj <sup>55</sup> -v	bɛj <sup>1</sup>	bɔj <sup>1</sup>	bɔj <sup>1</sup>	bɔj <sup>1</sup>	*bɔj <sup>A1</sup>
線	'thread'	mɔj <sup>1</sup>	mɔj <sup>1</sup>	mɛj <sup>1</sup>	mɔj <sup>1</sup>	mɔj <sup>1</sup>	mɔj <sup>1</sup>	*mɔj <sup>A1</sup>
膽	'gall bladder'	zɔj <sup>1</sup>	zɔj <sup>1</sup>	zɛj <sup>1</sup>	zɔj <sup>1</sup>	zɔj <sup>1</sup>	lɔj <sup>1</sup>	*zɔj <sup>A1</sup>
名字	'name'	nɔj <sup>1</sup>	nɔj <sup>1</sup>	nɛj <sup>1</sup>	nɔj <sup>1</sup>	nɔj <sup>1</sup>	nɔj <sup>1</sup>	*nɔj <sup>A1</sup>
貝類	'shellfish'	hɔj <sup>1</sup>	hɔj <sup>1</sup>	hɛj <sup>1</sup>	hɔj <sup>1</sup>	hɔj <sup>1</sup>	hɔj <sup>1</sup>	*hɔj <sup>A1</sup>
遠	'far'	lɔj <sup>1</sup>	lɔj <sup>1</sup>	lɛj <sup>1</sup>	lɔj <sup>1</sup>	lɔj <sup>1</sup>	lɔj <sup>1</sup>	*lɔj <sup>A1</sup>

**6.2.3.3. \*-e:**

Table 165 presents two lexical items, 'intestine' and 'to give', which in today's Ong-Be have /e/ or /ɛ/ as reflexes. I thus reconstruct \*-e: for Table 165.

**Table 165: \*-e:#**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
給	'to give'	--	se <sup>1</sup>	se <sup>1</sup>	sɛ <sup>1</sup>	sɛ <sup>1</sup>	sɛ <sup>1</sup>	*se: <sup>A1</sup>
腸	'intestine'	--	--	-tse <sup>4</sup>	--	tɛɛ <sup>4</sup>	tɛɛ <sup>4</sup>	*tse: <sup>BC2</sup>

A similar sound correspondence can be observed in Table 166 in which \*-e:ɳ, \*-e:m, and \*-e:n are reconstructed accordingly. Note that none of the rhymes is recurrent.

**Table 166: \*-e:ɳ, \*-e:m, and \*-e:n**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
脫、解開	'to take off'	keɳ <sup>7</sup>	keɳ <sup>7</sup>	keɳ <sup>7</sup>	keɳ <sup>7</sup>	keɳ <sup>7</sup>	keɳ <sup>7</sup>	*ke:ɳ <sup>D1</sup>
和	'and; with'	hem <sup>1</sup>	hem <sup>1</sup>	--	hem <sup>1</sup>	hem <sup>1</sup>	hem <sup>1</sup>	*he:m <sup>A1</sup>
好吃、甜	'delicious; sweet'	ɳen <sup>3</sup>	ɳien <sup>3</sup>	ɳen <sup>3</sup>	ɳɛn <sup>3</sup>	ɳɛn <sup>3</sup>	ɳɛn <sup>3</sup>	*ɳe:n <sup>BC1</sup>

I reconstruct \*-e:w for Table 167, based on the characteristics of the reflexes and the parallel development to the previous table.

**Table 167: \*-e:w**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
綠	'green'	hew <sup>1</sup>	hew <sup>1</sup>	hew <sup>1</sup>	--	--	--	*he:w <sup>A1</sup>
彎曲	'curve'	ʔew <sup>1</sup>	--	ʔew <sup>1</sup>	ʔɛw <sup>1</sup>	ʔɛw <sup>1</sup>	ʔɛw <sup>1</sup>	*ʔe:w <sup>A1</sup>
枯萎、皺紋	'withered; wrinkle'	new <sup>3</sup>	new <sup>3</sup>	new <sup>3</sup>	new <sup>3</sup>	ɲɛw <sup>3</sup>	ʐɛw <sup>3</sup>	*ɲe:w <sup>BC1</sup>

## 6.2.4. Proto central vowels

### 6.2.4.1. \*-ə:

Table 168 presents an e:o:ɔ:o:ɔ:o correspondence set not attested before. This vowel must be long, considering that all the words are in open syllables. Even though the majority of reflexes are /ɔ/, /ɔ/ should not be reconstructed because no other open-mid vowels are reconstructible and short vowels are not allowed in open syllables. And the reconstruction of \*-o: has been reserved for Table 149. For this reason, I postulate \*ə: for this set, which is now reflected as a back mid vowel in almost all Ong-Be varieties.

**Table 168: \*-ə:#**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
葉	'leaf'	bɛ <sup>2</sup>	bɔ <sup>2</sup>	bɔ <sup>2</sup>	bɔ <sup>2</sup>	bɔ <sup>2</sup>	bɔ <sup>2</sup>	*bə: <sup>A2</sup>
村子	'village'	bɛ <sup>3</sup>	vɔ <sup>3</sup>	vɔ <sup>3</sup>	vɔ <sup>3</sup>	vɔ <sup>3</sup>	vɔ <sup>3</sup>	*və: <sup>BC1</sup>
米糠	'chaff'	bɛ <sup>4</sup>	vɔ <sup>4</sup>	vɔ <sup>4</sup>	vɔ <sup>4</sup>	vɔ <sup>4</sup>	vɔ <sup>4</sup>	*və: <sup>BC2</sup>
清澈	'clean; clear'	he <sup>1</sup>	hɔ <sup>1</sup>	hɔ <sup>1</sup>	hɔ <sup>1</sup>	hɔ <sup>1</sup>	--	*hə: <sup>A1</sup>
抓	'to grab'	he <sup>2</sup>	hɔ <sup>2</sup>	hɔ <sup>2</sup>	hɔ <sup>2</sup>	hɔ <sup>2</sup>	hɔ <sup>2</sup>	*hə: <sup>A2</sup>
手	'hand'	me <sup>2</sup>	mɔ <sup>2</sup>	mɔ <sup>2</sup>	mɔ <sup>2</sup>	mɔ <sup>2</sup>	mɔ <sup>2</sup>	*mə: <sup>A2</sup>
屁股	'buttock'	-me <sup>4</sup>	-mɔ <sup>4</sup>	-mɔ <sup>4</sup>	-mɔ <sup>4</sup>	-mɔ <sup>4</sup>	-mɔ <sup>4</sup>	*mə: <sup>BC2</sup>
輕	'light (not heavy)'	kʰɛ <sup>3</sup>	kʰɔ <sup>3</sup>	kʰɔ <sup>3</sup>	xɔ <sup>3</sup>	xɔ <sup>3</sup>	kʰɔ <sup>3</sup>	*kʰə: <sup>BC1</sup>
大	'big'	ne <sup>3</sup>	nɔ <sup>3</sup>	--	nɔ <sup>3</sup>	ɲɔ <sup>3</sup>	ʐɔ <sup>3</sup>	*ɲə: <sup>BC1</sup>

The proto rhyme \*-ə:k is assigned to Table 169, since Qiaotou, Huangtong and

Yongxing all reflect this proto vowel as /ə/.

**Table 169: \*-ə:k**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
燒 (柴)	'to burn (firewood)'	bək <sup>7</sup>	--	bik <sup>7</sup>	--	bək <sup>7</sup>	--	*bə:k <sup>D1</sup>
孩子	'child'	lɛk <sup>8</sup>	lɛk <sup>8</sup>	lɛk <sup>8</sup>	lək <sup>8</sup>	lək <sup>8</sup>	lək <sup>8</sup>	*lə:k <sup>D2</sup>
紡織機	'loom'	-dɛk <sup>8</sup>	-dɛk <sup>8</sup>	-dɛk <sup>8</sup> (L&Z)	-dɛk <sup>8</sup> 'shuttle'	-dɛk <sup>8</sup> (BL)	--	*dɛ:k <sup>D2</sup>

In Table 170, a majority of Ong-Be varieties reflect this proto rhyme as /-əʔ/, hence \*-ə:ʔ is reconstructed.

**Table 170: \*-ə:ʔ**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
爬行	'to crawl'	--	--	--	ləʔ <sup>8</sup>	ləʔ <sup>8</sup>	ləʔ <sup>8</sup>	*lə:ʔ <sup>D2</sup>
吞、嚥	'to swallow'	ləʔ <sup>7</sup>	liʔ <sup>7</sup>	liʔ <sup>7</sup>	ləʔ <sup>7</sup>	ləʔ <sup>7</sup>	--	*lə:ʔ <sup>D1</sup>
滴	'to drop'	tsəʔ <sup>7</sup>	tsiʔ <sup>7</sup>	tsiʔ <sup>7</sup>	tsəʔ <sup>7</sup>	tsəʔ <sup>7</sup>	tsəʔ <sup>7</sup>	*tsə:ʔ <sup>D1</sup>

Because Qiaotou, Huangtong, and Xinying all have /ə/ as the reflex, I reconstruct \*-ə:m for Table 171, considering that the quality of proto vowels is more likely to be retained in western Ong-Be varieties. I also propose that due to regressive assimilation from the bilabial nasal coda, earlier schwa has become [+round] in Eastern Ong-Be.

**Table 171: \*-ə:m**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
飽	'full (after eating)'	kom <sup>2</sup>	kum <sup>2</sup>	kum <sup>2</sup>	kəm <sup>2</sup>	kəm <sup>2</sup>	kəm <sup>2</sup>	*kə:m <sup>A2</sup>
醃	'to pickle'	--	--	zum <sup>4</sup>	--	zəm <sup>4</sup>	ləm <sup>4</sup>	*zə:m <sup>BC2</sup>

Because the selected varieties all reflect this rhyme as /ən/, the rhyme \*-ə:n is reconstructed for Table 172.

**Table 172: \*-ə:n**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
柴	'firewood'	bən <sup>2</sup>	vən <sup>2</sup>	vən <sup>2</sup>	vən <sup>2</sup>	vən <sup>2</sup>	vən <sup>2</sup>	*və:n <sup>A2</sup>
辣	'spicy'	--	kən <sup>2</sup>	kən <sup>2</sup>	kən <sup>2</sup>	kən <sup>2</sup>	kən <sup>2</sup>	*kə:n <sup>A2</sup>
不	'negator'	mən <sup>2</sup> 'to have'	mən <sup>2</sup> 'to have'	mən <sup>2</sup> 'to have'	mən <sup>2</sup>	mən <sup>2</sup>	mən <sup>2</sup>	*mə:n <sup>A2</sup>
翻面	'to flip over'	bən <sup>4</sup>	bən <sup>4</sup>	vən <sup>4</sup>	vən <sup>4</sup>	vən <sup>4</sup>	--	*və:n <sup>BC2</sup>

I reconstruct \*-ə:ŋ for Table 173 because both words show an ə:i:i:ə:ə:ə correspondence similar to the above set, for which I reconstruct a schwa. The word ‘ear of rice/grain’ shows inconsistency in the coda, where the first three varieties have /ŋ/ and the others have /n/. We have to look beyond Ong-Be to see how the coda is reflected in its sister language. It appears that ‘ear of rice/grain’ in Proto-Tai is \*ruaŋ<sup>A2</sup> (F. Li 1977) or \*rɯu:ŋ<sup>A</sup> (Pittayaporn 2009). The coda for ‘ear of rice/grain’ in Proto-Ong-Be is thus reconstructed as \*-ŋ.

**Table 173: \*-ə:ŋ**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto-Ong-Be
稻穗	‘ear of rice/grain’	zəŋ <sup>1</sup>	ziŋ <sup>1</sup>	ziŋ <sup>1</sup>	zəŋ <sup>1</sup>	ləŋ <sup>1</sup>	ləŋ <sup>1</sup>	*zə:ŋ <sup>A1</sup>
回(家)	‘to return’	--	liŋ <sup>1</sup>	liŋ <sup>1</sup> (L&Z)	--	ləŋ <sup>1</sup>	ləŋ <sup>1</sup>	*lə:ŋ <sup>A1</sup>

While Changliu and Yongxing reflect this proto rhyme as /ɛj/, Qiaotou, Huangtong and Xinying have /əj/. Although Longtang has /ej/ for this table, these example words are pronounced as [ɛj]. In Longtang the rhyme /ej/ has [ɛj] and [ɛj] as allophones where [ɛj] is only found in Tone 1’. I therefore reconstruct \*-ə:j for Table 174.

**Table 174: \*-ə:j (Initial reconstruction, revised in later sections)**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto-Ong-Be
醉	‘drunk’	mɛj <sup>2</sup>	mɛj <sup>2</sup>	mɛj <sup>2</sup>	mɛj <sup>2</sup>	mɛj <sup>2</sup>	mɛj <sup>2</sup>	*mə:j <sup>A2</sup>
游泳	‘to swim’	zɛ <sup>2</sup>	--	zɛj <sup>2</sup>	zəj <sup>2</sup>	ləj <sup>2</sup>	ləj <sup>2</sup>	*zə:j <sup>A2</sup>
腐爛	‘rotten’	dɛj <sup>2</sup>	dɛj <sup>2</sup>	dɛj <sup>2</sup>	dəj <sup>2</sup>	dəj <sup>2</sup>	dəj <sup>2</sup>	*də:j <sup>A2</sup>
火	‘fire’	bɛ <sup>2</sup>	vɛj <sup>2</sup>	vɛj <sup>2</sup>	vəj <sup>2</sup>	vəj <sup>2</sup>	vəj <sup>2</sup>	*və:j <sup>A2</sup>
水牛	‘water buffalo’	tɛj <sup>3</sup>	tɛj <sup>3</sup>	tɛj <sup>3</sup>	təj <sup>3</sup>	təj <sup>3</sup>	təj <sup>3</sup>	*tə:j <sup>BC1</sup>
蓑衣	‘straw cape’	tɛj <sup>4</sup>	tɛj <sup>4</sup>	tɛj <sup>4</sup>	təj <sup>4</sup>	təj <sup>4</sup>	təj <sup>4</sup>	*tə:j <sup>BC2</sup>

\*-ə:w is reconstructed for Table 175. In Changliu, we see that the -w- has a rounding effect on preceding vowels, illustrated by ‘chopsticks’ and ‘door’. ‘Chopsticks’ is likely to be a Chinese loan from 箸 \*tɕio before Proto-Ong-Be diversified, because it is the only example that has \*s- appearing in series 2. Given the rhyme in ‘bazaar’ in Yongxing and

Longtang, it is plausible to consider it a later Chinese loan found in the Sino-Ong-Be stratum.<sup>77</sup>

**Table 175: \*-ə:w**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
筷子	'chopsticks'	so <sup>4</sup> ; səw <sup>4</sup> (XIN)	səw <sup>4</sup>	sə <sup>4</sup>	səw <sup>4</sup>	səw <sup>4</sup>	səw <sup>4</sup>	*sə:w BC2
門	'door'	dɔw <sup>2</sup>	-dəw <sup>2</sup>	-dəw <sup>2</sup>	--	--	--	*də:w A2
市集	'bazaar'	how <sup>1</sup>	(hi <sup>1</sup> )	(hi <sup>1</sup> )	həw <sup>1</sup>	həw <sup>1</sup>	həw <sup>1</sup>	*hə:w A1

#### 6.2.4.2. \*-i:

Changliu is the only Ong-Be variety that, in addition to a schwa, has /u/ found only in a handful of words, e.g., /zɯn<sup>3</sup>/ 'rabbit' and /zən<sup>2</sup>/ 'to crawl'. Thus, Proto-Ong-Be is likely to have had two central vowels. While \*ə is moderately well attested, \*i survives only in remnants.

**Table 176: \*-i:n (Initial reconstruction, revised in later sections)**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
前天	'the day before yesterday'	-hən <sup>1</sup>	-hin <sup>1</sup>	-hin <sup>1</sup>	-hən <sup>1</sup>	-hən <sup>1</sup>	-hən <sup>1</sup>	*hi:n A1
旱田、山坡地	'dry land; hillside'	--	--	bin <sup>3</sup>	vən <sup>3</sup>	vən <sup>3</sup>	vən <sup>3</sup>	*vi:n BC1
兔子	'rabbit'	zɯn <sup>3</sup>	zin <sup>3</sup>	zin <sup>3</sup>	zən <sup>3</sup>	lən <sup>3</sup>	lən <sup>3</sup>	*zi:n BC1
淺	'shallow'	dɯn <sup>3</sup>	din <sup>3</sup>	din <sup>3</sup>	dən <sup>3</sup>	dən <sup>3</sup>	dən <sup>3</sup>	*di:n BC1
上(山)	'to ascend'	kun <sup>3</sup>	kin <sup>3</sup>	kin <sup>3</sup>	kən <sup>3</sup>	kən <sup>3</sup>	kən <sup>3</sup>	*ki:n BC1

Table 177 shows that the western Ong-Be subgroup has a reflex that is identical to the one found in Table 174. On the contrary, the eastern subgroup reflects this proto rhyme differently. Taking the Changliu data into consideration, \*-i:j is reconstructed.

<sup>77</sup> Wei (2003) discusses the etymology of 'bazaar', which is said to be borrowed from Kra-Dai into Chinese in the first place.

**Table 177: \*-i:j (Initial reconstruction, revised in later sections)**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
流	‘to flow’	le <sup>1</sup>	li <sup>1</sup>	li <sup>1</sup>	ləj <sup>1</sup>	ləj <sup>1</sup>	ləj <sup>1</sup>	*li:j <sup>A1</sup>
空	‘empty’	zuuj <sup>1</sup>	zi <sup>1</sup>	zi <sup>1</sup>	zəj <sup>1</sup>	ləj <sup>1</sup>	ləj <sup>1</sup>	*zi:j <sup>A1</sup>

**6.2.4.3. \*-ə**

The correspondence demonstrated in Table 178 shows two opposite directions.

Consequently, I reconstruct \*-əm for this set because central vowels are less stable and in Proto-Ong-Be short vowels are more likely to change in closed syllables, as illustrated in the aforementioned reflexes of \*-a- versus \*-a:-, \*-i- versus \*-i:-, and \*-u- and \*-u:-. The vowels in Changliu, Yongxing, and Longtang might be raised by *-m*.

**Table 178: \*-əm**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
南	‘south’	nim <sup>2</sup>	nom <sup>2</sup>	nom <sup>2</sup>	nom <sup>2</sup>	nɔm <sup>2</sup>	nɔm <sup>2</sup>	*nəm <sup>A2</sup>
夜晚	‘night’	kim <sup>4</sup>	kom <sup>4</sup>	kom <sup>4</sup>	kom <sup>4</sup>	kɔm <sup>4</sup>	kɔm <sup>4</sup>	*kəm <sup>BC2</sup>
壞	‘bad (not good)’	tsim <sup>4</sup>	tsom <sup>4</sup>	ts <sup>(h)</sup> om <sup>4</sup>	--	--	--	*tsəm <sup>BC2</sup>

In Table 179, the proto rhyme \*-ən is reconstructed. ‘Seed’, ‘maggot’, ‘sweat’ and ‘heavy’ all have the same, recurrent vowel correspondence, parallel to the above table.

**Table 179: \*-ən**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
重	‘heavy’	k <sup>h</sup> en <sup>1</sup>	k <sup>h</sup> ɔn <sup>1</sup>	k <sup>h</sup> ɔn <sup>1</sup>	xon <sup>1</sup>	xɔn <sup>1</sup>	k <sup>h</sup> ɔn <sup>1</sup>	*k <sup>h</sup> ən <sup>A1</sup>
種子	‘seed’	ben <sup>2</sup>	vən <sup>2</sup>	vɔn <sup>2</sup>	von <sup>2</sup>	vɔn <sup>2</sup>	vɔn <sup>2</sup>	*vən <sup>A2</sup>
蛆	‘maggot’	ten <sup>3</sup>	tɔn <sup>3</sup>	tɔn <sup>3</sup>	ton <sup>3</sup>	tɔn <sup>3</sup>	tɔn <sup>3</sup>	*tən <sup>BC1</sup>
汗水	‘sweat’	hen <sup>4</sup>	hɔn <sup>4</sup>	hɔn <sup>4</sup>	hon <sup>4</sup>	hɔn <sup>4</sup>	hɔn <sup>4</sup>	*hən <sup>BC2</sup>

Given the sound correspondences observed in Table 180 and Table 181, \*-əw and \*-əj are reconstructed respectively.



**Table 180: \*-əw**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
下午	'afternoon'	-tsew <sup>2</sup>	-tsow <sup>2</sup>	--	-tsow <sup>2</sup>	-tsow <sup>2</sup>	-tsow <sup>2</sup>	*tsəw <sup>A2</sup>
蚯蚓	'earthworm'	-new <sup>2</sup>	-nɔw <sup>2</sup>	-nɔw <sup>2</sup>	nɔw <sup>2</sup>	nɔw <sup>2</sup>	nɔw <sup>2</sup>	*nəw <sup>A2</sup>
膝蓋	'knee'	-hew <sup>2</sup>	-hɔw <sup>2</sup>	-hɔw <sup>2</sup>	--	--	--	*həw <sup>A2</sup>
東西、物 件	'thing; object'	kew <sup>4</sup>	kɔw <sup>4</sup>	kɔw <sup>4</sup>	kɔw <sup>4</sup>	kɔw <sup>4</sup>	kɔ <sup>4</sup>	*kəw <sup>BC2</sup>
吹	'to blow'	ɸew <sup>4</sup>	vɔw <sup>4</sup>	vɔw <sup>4</sup>	vɔw <sup>4</sup>	vɔw <sup>4</sup>	vɔw <sup>4</sup>	*vəw <sup>BC2</sup>
灰燼、草 木灰	'ash'	ɸew <sup>4</sup>	ɸɔw <sup>4</sup>	ɸɔw <sup>4</sup>	ɸɔw <sup>4</sup>	ɸɔw <sup>4</sup>	ɸɔw <sup>4</sup>	*ɸəw <sup>BC2</sup>

**Table 181: \*-əj**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
後背	'back' (n.)	-le <sup>2</sup>	-lɔj <sup>2</sup>	-lɔj <sup>2</sup>	-lɔj <sup>2</sup>	-lɔj <sup>2</sup>	-lɔj <sup>2</sup>	*ləj <sup>A2</sup>
犁	'plow'	le <sup>2</sup>	lɔj <sup>2</sup>	lɔj <sup>2</sup>	lɔj <sup>2</sup>	lɔj <sup>2</sup>	lɔj <sup>2</sup>	*ləj <sup>A2</sup>
問	'to ask'	tej <sup>3</sup>	tɔj <sup>3</sup>	tɔj <sup>3</sup>	tɔj <sup>3</sup>	tɔj <sup>3</sup>	tɔj <sup>3</sup>	*təj <sup>BC1</sup>

#### 6.2.4.4. \*-i

Table 182 has only one example where 'day' shows a sound correspondence different from 'firewood' in Table 172. I tentatively reconstruct \*-in for 'day'. Because no other rhymes containing \*-i- are observed in my data, I do not reject the possibility that this could be a sporadic change.

**Table 182: \*-in**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
日子	'day'	ban <sup>2</sup>	vɔn <sup>2</sup>	vɔn <sup>2</sup>	vən <sup>2</sup>	vən <sup>2</sup>	vən <sup>2</sup>	*vin <sup>A2</sup>

### 6.3. A reconstruction of Proto-Ong-Be diphthongs

#### 6.3.1. \*-ia

As mentioned at the beginning of this chapter, \*-ia and \*-ua are diphthongs reconstructible to Proto-Ong-Be. Table 183 presents a list of cognates containing \*-ia which is faithfully retained in contemporary Ong-Be varieties.

**Table 183: \*-ia**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
藥	medicine	zia <sup>1</sup>	zia <sup>1</sup>	zia <sup>1</sup>	zia <sup>1</sup>	zia <sup>1</sup>	zia <sup>1</sup>	*zia <sup>A1</sup>
椰子	coconut	-zia <sup>2</sup>	-zia <sup>2</sup>	-zia <sup>2</sup>	-zia <sup>2</sup>	-zia <sup>2</sup>	-zia <sup>2</sup>	*zia <sup>A2</sup>
茅草	thatch	-tia <sup>2</sup>	-tia <sup>2</sup>	-tia <sup>2</sup>	tia <sup>2</sup>	tia <sup>2</sup>	tia <sup>2</sup>	*tia <sup>A2</sup>
水田	paddy field	nia <sup>2</sup>	nia <sup>2</sup>	nia <sup>2</sup>	nia <sup>2</sup>	nia <sup>2</sup>	nia <sup>2</sup>	*nia <sup>A2</sup>
蛇	snake	ɲia <sup>2</sup>	ɲia <sup>2</sup>	ɲia <sup>2</sup>	ɲia <sup>2</sup>	ɲia <sup>2</sup>	ɲia <sup>2</sup>	*ɲia <sup>A2</sup>
肩膀	shoulder	-bia <sup>3</sup>	-bia <sup>3</sup>	-bia <sup>3</sup>	-via <sup>3</sup>	-via <sup>3</sup>	-via <sup>3</sup> ‘arm’	*via <sup>BC1</sup>

The diphthong \*-ia can be found in closed syllables as well, as illustrated by Table 184 and Table 185. I reconstruct \*-iat and \*-iak for the former, and \*-ian and \*-ianɲ for the latter.

**Table 184: \*-iat and \*-iak**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
波羅蜜	jackfruit	-miat <sup>8</sup>	-miat <sup>8</sup>	-miat <sup>8</sup>	-miat <sup>8</sup>	-miat <sup>8</sup>	-miat <sup>8</sup>	*miat <sup>D2</sup>
樹根	‘root; <i>Ficus microcorpa</i> ’	--	ziak <sup>8</sup>	ziak <sup>8</sup>	-ziak <sup>8</sup> ‘banyan’	-liak <sup>8</sup> ‘banyan’	-liak <sup>8</sup> ‘banyan’	*ziak <sup>D2</sup>

‘To buy’ in Longtang shows that \*-a- in \*-ia was raised to -ɛ- prior to the loss of \*-i-.

**Table 185: \*-ian and \*-ianɲ**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
買	‘to buy’	bian <sup>1</sup>	bian <sup>1</sup> [biɛn]	bian <sup>1</sup> [bɛn]	vian <sup>1</sup> [viɛn]	vian <sup>1</sup>	vian <sup>1</sup>	*vian <sup>A1</sup>
薄	‘thin (not thick)’	bian <sup>1</sup>	bian <sup>1</sup>	bian <sup>1</sup>	vian <sup>1</sup>	vian <sup>1</sup>	vian <sup>1</sup>	*vian <sup>A1</sup>
放	‘to put down’	bian <sup>3</sup>	bian <sup>3</sup>	bian <sup>3</sup>	bian <sup>3</sup>	bian <sup>3</sup>	bian <sup>3</sup>	*bian <sup>BC1</sup>
乾	‘dry’	zian <sup>3</sup>	zian <sup>3</sup>	zian <sup>3</sup>	zian <sup>3</sup>	lian <sup>3</sup>	lian <sup>3</sup>	*zian <sup>BC1</sup>
男人	‘man’	--	--	-k <sup>h</sup> ian <sup>4</sup>	-xian <sup>4</sup>	-xian <sup>4</sup>	-k <sup>h</sup> ian <sup>4</sup>	*k <sup>h</sup> ian <sup>BC2</sup>

\*-iaw is assigned to Table 186. The first two lexical items, ‘to run’ and ‘month’, show a peculiar reflex in Changliu compared to the rest of the Ong-Be varieties. I propose that, like the sound change in ‘to buy’ mentioned above, some examples of \*-iaw have gradually become -ew, possibly via an intermediate stage \*-iew.

**Table 186: \*-iaw**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto-Ong- Be
跑	'to run'	ɖiaw <sup>2</sup>	ɖew <sup>2</sup>	ɖew <sup>2</sup>	ɖɛw <sup>2</sup>	ɖɛw <sup>2</sup>	ɖɛw <sup>2</sup>	*ɖiaw <sup>A2</sup>
月	'month'	kiaw <sup>2</sup>	kew <sup>2</sup>	kew <sup>2</sup>	kɛw <sup>2</sup>	kɛw <sup>2</sup>	kɛw <sup>2</sup>	*kiaw <sup>A2</sup>
多	'many'	liaw <sup>4</sup>	liaw <sup>4</sup>	liaw <sup>4</sup>	liaw <sup>4</sup>	liaw <sup>4</sup>	liaw <sup>4</sup>	*liaw <sup>BC2</sup>
霧、露水	'fog; dew'	--	ŋiaw <sup>4</sup>	ŋiaw <sup>4</sup>	ŋiaw <sup>4</sup>	ŋiaw <sup>4</sup>	ŋiaw <sup>4</sup>	*ŋiaw <sup>BC2</sup>

**6.3.2. \*-ua**

Today's Ong-Be varieties employ /ua/ for this proto vowel. Due to the majority-wins principle and word minimality, \*ua is reconstructed.

**Table 187: \*-ua**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
老虎	tiger	zua <sup>1</sup>	zua <sup>1</sup>	zua <sup>1</sup>	--	zua <sup>1</sup> 'lion' (LC)	--	*zua <sup>A1</sup>
衣服	clothes	-zua <sup>3</sup>	zua <sup>3</sup>	zua <sup>3</sup>	zua <sup>3</sup>	-zua <sup>3</sup>	-zua <sup>3</sup>	*zua <sup>BC1</sup>
酸	sour	hua <sup>3</sup>	hua <sup>3</sup>	hua <sup>3</sup>	ʔua <sup>3</sup>	hua <sup>3</sup>	hua <sup>3</sup>	*hua <sup>BC1</sup>

Parallel to \*ia, Table 188 lists words containing \*ua in closed syllables. \*-uat, \*-uak and \*-uaʔ are reconstructed accordingly. The word for 'firm; hard' is extremely crucial to the reconstruction of \*ua, because Changliu reflects it as /zuaʔ<sup>7</sup>/ which contains /-aʔ/, whereas only /-aʔ/ is found elsewhere (see Table 136), i.e., not after -u-, which could possibly be analyzed as -w- if it were not for Changliu.

**Table 188: \*-uat, \*-uak, and \*-uaʔ**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
寬	'wide'	k <sup>h</sup> uat <sup>7</sup>	k <sup>h</sup> uat <sup>7</sup>	k <sup>h</sup> uat <sup>7</sup>	xuat <sup>7</sup>	xuat <sup>7</sup>	k <sup>h</sup> uat <sup>7</sup>	*k <sup>h</sup> uat <sup>D1</sup>
渴	'thirsty'	k <sup>h</sup> uat <sup>7</sup> -	k <sup>h</sup> ot <sup>7</sup> -	k <sup>h</sup> uat <sup>7</sup> -	xot <sup>7</sup> -	xuat <sup>7</sup> -	k <sup>h</sup> uat <sup>7</sup> -	*k <sup>h</sup> uat <sup>D1</sup>
弄髒	'to make things dirty'	luak <sup>7</sup> (XIN)	luak <sup>7</sup>	luak <sup>7</sup> (L&Z)	--	luak <sup>7</sup> (LC)	luak <sup>7</sup> (BL)	*luak <sup>D1</sup>
嘔吐	'to vomit'	ɖuak <sup>8</sup>	ɖuak <sup>8</sup>	ɖuak <sup>8</sup>	ɖuak <sup>8</sup>	ɖuak <sup>8</sup>	ɖuak <sup>8</sup>	*ɖuak <sup>D2</sup>
硬	'firm; hard'	zuaʔ <sup>7</sup>	zuaʔ <sup>7</sup>	zuaʔ <sup>7</sup>	zuaʔ <sup>7</sup>	luaʔ <sup>7</sup>	luaʔ <sup>7</sup>	*zuaʔ <sup>D1</sup>

\*-uan and \*-uanj are reconstructible to Proto-Ong-Be (see Table 189). Table 188 and

Table 189 show that the quality of \*ua is fairly stable even in closed syllables. In

Longtang the aspirated velar onset  $k^h$ - in ‘lychee’ could be a sporadic change resulting from progressive assimilation ( $/mak^8 huan^1/ \rightarrow /mak^8 k^huan^1/$ ) where the unreleased stop coda becomes aspirated and, crucially, resyllabified as the onset consonant under the influence of the original fricative initial  $h$ -.

**Table 189: \*-uan and \*-uan**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
荔枝	‘lychee’	-huan <sup>1</sup>	-huan <sup>1</sup>	$k^huan^1$ -i	-(h)uan <sup>1</sup>	-(h)uan <sup>1</sup>	-huan <sup>1</sup>	*huan <sup>A1</sup>
竹子	‘bamboo’	kuan <sup>2</sup>	kuan <sup>2</sup>	kuan <sup>2</sup>	--	kuan <sup>2</sup>	kuan <sup>2</sup>	*kuan <sup>A2</sup>
小蝦	‘paw’n’	zuan <sup>2</sup>	--	zuan <sup>2</sup>	zuan <sup>2</sup>	luan <sup>2</sup>	luan <sup>2</sup>	*zuan <sup>A2</sup>
羊	‘sheep’	--	tuan <sup>2</sup>	tuan <sup>2</sup>	tuan <sup>2</sup>	tuan <sup>2</sup>	tuan <sup>2</sup>	*tuan <sup>A2</sup>

As given in Table 190, there are two examples of *-uaj*. I tentatively reconstruct \*-uaj for Proto-Ong-Be.

**Table 190: \*-uaj**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
煙 (燒柴的煙)	‘smoke’	--	--	--	duaj <sup>4</sup>	duaj <sup>4</sup>	duaj <sup>4</sup>	*duaj <sup>BC2</sup>
累	‘tired’	--	nuaj <sup>3</sup>	nuaj <sup>3</sup>	nuaj <sup>3</sup>	nuaj <sup>3</sup>	nuaj <sup>3</sup>	*nuaj <sup>BC1</sup>

#### 6.4. Phonotactics and phonological rules

Table 191 presents the attested phonotactics in my Proto-Ong-Be rhyme system, in which the shaded areas indicate distributional gaps. Note that the reconstructed rhymes are not meant to be exhaustive. In general, this table shows that proto short vowels were not allowed in open syllables. In other words, that \*-a:#, \*-e:#, and \*-ə:# are attested while their short counterparts are missing. Nevertheless, \*-i:# and \*-u:# have not been reconstructed. No \*-u(:)w and \*-i(:)j rhymes are reconstructible, which might be due to a phonotactic constraint that avoids two phonologically similar vocalic elements appearing in sequence.

It is noteworthy that, as mentioned earlier, western Ong-Be varieties, such as Qiaotou, Huangtong, and Xinying, show a tendency to maintain the original proto vowel quality while losing their quantity contrast. Eastern Ong-Be varieties, on the contrary, reflect the earlier length distinction via different vowel qualities, in which the original quality of proto short vowels has been transformed in Changliu, Yongxing, and Longtang.

**Table 191: Phonotactics in Proto-Ong-Be**

Proto-Ong-Be	Changliu	Huangtong	Proto-Ong-Be	Changliu	Huangtong
*-a:#	-a	-a	No *-a#	--	--
*-a:p	-ap	-ap	*-ap	-ap	-ap
No *-a:t	--	--	*-at	-at	-at
*-a:k	-ak	-ak	*-ak	-ak	-ak
No *-a:ʔ	--	--	*-aʔ	-aʔ	-aʔ
*-a:m	-am	-am	*-am	-am	-am
*-a:n	-an	-an	*-an	-an	-an
*-a:ŋ	-aŋ	-aŋ	*-aŋ	-aŋ; -aŋ	-aŋ
*-a:w	-aw	-aw	*-aw	-aw; -aw	-aw
*-a:j	-aj	-aj	*-aj	-aj	-aj
No *-i:#	--	--	No *-i#	--	--
No *-i:p	--	--	*-ip	-ɔp	-ip
*-i:t	-it	-it	*-it	-ɔt; -at	-it
*-i:k	-ik (Longtang)	-ik	(*-ik)	-ɛk (Longtang)	--
(*-i:ʔ)	-iʔ	--	*-iʔ	-uʔ	-iʔ
*-i:m	-im	-im	No *-im	--	--
*-i:n	-in	-in	*-in	-ɔn; -an	-in
*-i:ŋ	-iŋ (Longtang)	-iŋ	*-iŋ	-ɛŋ (Longtang)	-iŋ
*-i:w	-iw	-iw	No *-iw	--	--
No *-u:#	--	--	No *-u#	--	--
(*-u:p)	-up	-up	No *-up	--	--
(*-u:t)	-ut (Longtang)	-ut	(*-ut)	-ɔt (Longtang)	-ut
*-u:k	-uk	-uk	No *-uk	--	--
*-u:ʔ	-uʔ	-uʔ	No *-uʔ	--	--
(*-u:m)	-um	-um	*-um	-ɔm	-um
*-u:n	-un	-un	*-un	-ɔn; -an	-un
*-u:ŋ	-uŋ	-uŋ	No *-uŋ	--	--
*-u:j	-uj; -oj	-uj	No *-uj	--	--
No *-u:w	--	--	No *-uw	--	--
*-o:#	-o	-o	No *-o#	--	--
*-o:p	-op; -ɔp	-op	*-op	-ap	-ɔp
*-o:t	-ot	-ot	*-ot	-at; -ɔt	-ɔt
*-o:k	-uak	-ok	*-ok	-ɔk	-ok; -ɔk
*-o:ʔ/k__	-ɔʔ	-ɔʔ	No *-oʔ	--	--
*-o:m	-om	-ɔm	No *-om	--	--
(*-o:n)	-on	-on	*-on/k__	-ɔn	-ɔn
*-o:ŋ	-ɔŋ	-oŋ	*-oŋ	-ɔŋ	-ɔŋ
(*-o:j)	-oj	-oj	*-oj	-ɔj	-ɔj
No *-o:w	--	--	*-ow	-ow	-ɔw

Proto-Ong-Be	Changliu	Huangtong	Proto-Ong-Be	Changliu	Huangtong
*-ə:#	-e	-ɔ	No *-ə#	--	--
No *-ə:p	--	--	No *-əp	--	--
No *-ə:t	--	--	No *-ət	--	--
*-ə:k	-ək; -ek	-ək	No *-ək	--	--
*-ə:ʔ	-əʔ	-əʔ	No *-əʔ	--	--
*-ə:m (Tone 2 & 4)	-om	-əm	*-əm	-im	-om
*-ə:n	-ən (Tones 2 & 4)	-ən	*-ən (Tone 1-4)	-en	-ɔn
*-ə:ŋ	-əŋ	-əŋ	No *-əŋ	--	--
*-ə:j	-ɛj; -ej (Tone 2-4)	-əj	*-əj	-ej	-ɔj
*-ə:w	-əw	-əw	*-əw	-ew	-ɔw
*-i:n	-wn or -un/k__ (Tones 1 & 3)	-ən	(*-in) (Tone 2)	-an	-ən
*-i:j	-wj (Tone 1)	-əj	No *-ij	--	--
*-e:#	-e (LT)	-ɛ	No *-e#	--	--
No *-e:p	--	--	No *-ep	--	--
No *-e:t	--	--	No *-et	--	--
No *-e:k	--	--	No *-ek	--	--
*-e:ʔ	-eʔ	-ɛʔ	No *-eʔ	--	--
*-e:m	-em	-ɛm	No *-em	--	--
*-e:n	-en	-ɛn	No *-en	--	--
No *-e:ŋ	--	--	No *-eŋ	--	--
No *-e:j	--	--	No *-ej	--	--
*-e:w	-ew	-ɛw	No *-ew	--	--

Table 191 raises several questions which require further discussion. First of all, the fact that \*-e- is not found in any closed syllables and that \*-e:- is found only in a few rhymes raises a concern as to whether \*-e: or \*-e should be reconstructed at all. Second, how many central vowels should be reconstructed for Proto-Ong-Be, considering that \*-i- is attested only in a handful of tokens? It seems that \*-ə:n and \*-i:n occur in complementary distribution because the former is attested in Tones A2 (=2) and BC2 (=4), while the latter is found in Tones A1 (=1) and BC1 (3), as shown in Table 192. A similar distribution can be seen in \*-ə:j (Tones A2, BC1, and BC2) and \*-i:j (A1) as well. I thus conclude that only \*-ə:n and \*-ə:j are needed. As for their short counterparts, a minimal pair, \*vən<sup>A2</sup> ‘seed’ and \*vin<sup>A2</sup> ‘day’, is attested, indicating the need to separate \*-in from \*-ən. However, \*-in is non-recurrent, which casts doubt on this reconstruction.

For now, I reconstruct only one central vowel (schwa) for Proto-Ong-Be and leave \*-in aside until more relevant data are uncovered.

**Table 192: The original \*-ə(:)- and \*-i(:)-**

Proto-Ong-Be	Changliu	Huangtong	Proto-Ong-Be	Changliu	Huangtong
*-ə:n	-ən (Tones 2 & 4)	-ən	*-ən (Tones 1-4)	-en	-ɔn
*-i:n	-un; -un/k__ (Tones 1 & 3)	-ən	(*-in) (Tone 2)	-an	-ən
*-ə:j	-ɛj; -ej (Tone 2-4)	-əj	*-əj	-ej	-ɔj
*-i:j	-uj (Tone 1)	-əj	No *-ij	--	--

In the sections below, I will discuss and re-evaluate the status of my proposed \*-o(:)- as well as \*-ə(:)-. Table 193 shows that in my proposed system, \*-op, \*-ot, \*-ok, and \*-oŋ are in complementary distribution with \*-əp, \*-ət, \*-ək, and \*-əŋ, which I combine accordingly. When \*-on (see Table 161) and \*-ən (see Table 179) are compared, my proposed \*-on often occur before *k*-, whereas \*-ən occurs elsewhere. This proposed \*-on should therefore be regarded as derived from \*-ən. I will discuss \*-oj, \*-ow, \*-əj, and \*-əw, later.

**Table 193: The distribution of the original \*-o- and \*-ə-**

Proto-Ong-Be	Changliu	Huangtong	Proto-Ong-Be	Changliu	Huangtong
*-op	-ap	-ɔp	No *-əp	--	--
*-ot	-at; -ɔt	-ɔt	No *-ət	--	--
*-ok	-ɔk	-ok; -ɔk	No *-ək	--	--
No *-om	--	--	*-əm	-im	-om
*-on/k__	-ɔn	-ɔn	*-ən	-en	-ɔn
*-oŋ	-ɔŋ	-ɔŋ	No *-əŋ	--	--
*-oj	-ɔj	-ɔj	*-əj	-ej	-ɔj
*-ow	-ow	-ɔw	*-əw	-ew	-ɔw

The distribution of \*-o:- and \*-ə:- is presented in Table 194. These vowels do not appear to be in complementary distribution for there are many overlaps. The reconstruction of \*-o:t ('zongzi' which is a cultural cuisine), \*-o:n ('to castrate') and \*-o:j ('lime' which is clearly a Chinese loan) are tentative for they each have only one reflex, cf. \*-ə:n and \*-ə:j which are recurrent and can be reconstructed with confidence (no \*-ə:t).

**Table 194: The distribution of the original \*-o:- and \*-ə:-**

Proto-Ong-Be	Changliu	Huangtong	Proto-Ong-Be	Changliu	Huangtong
*-o:p	-op; -ɔp	-op	No *-ə:p	--	--
(*-o:t)	-ot	-ot	No *-ə:t	--	--
*-o:k	-uak	-ok	*-ə:k	-ək; -ɛk	-ək
*-o:ʔ/k__	-ɔʔ	-ɔʔ	*-ə:ʔ	-əʔ	-əʔ
*-o:m (Tones 1&3)	-om	-ɔm	*-ə:m (Tones 2 &4)	-om	-əm
(*-o:n)	-on	-on	*-ə:n	-ən; -ɯn or -un/k__	-ən
*-o:ŋ	-ɔŋ	-oŋ	*-ə:ŋ	-əŋ	-əŋ
(*-o:j)	-oj	-oj	*-ə:j	-ɛj or -ej; -ɯj (Tone 1)	-əj
No *-o:w	--	--	*-ə:w	-əw	-əw

Other overlapping rhymes include \*-o:k and \*-ə:k, \*-o:ʔ and \*-ə:ʔ, as well as \*-o:ŋ and \*-ə:ŋ. The rhyme, \*-o:ʔ, has only one reflex ‘stinky’ with *k*- as its onset (cf. Table 170 where none of the three cognate sets containing \*-ə:ʔ shares this voiceless unaspirated velar onset). The onset *k*- seems to have a rounding effect on the vowels following it, which was also seen in the combination of \*-on and \*-ən. I thus combine \*-o:ʔ with \*-ə:ʔ, leaving only \*-ə:ʔ in my revised system.

The proposed \*-ə:k and \*-ə:ŋ both show a regular ə:ə correspondence (see Table 169 and Table 173), as do those found in the revised \*-ə:ʔ and \*-ə:n. For this reason, \*-ə:k and \*-ə:ŋ remain as \*-ə:k and \*-ə:ŋ in my new system. I will attend to \*-o:k and \*-o:ŋ later (see Table 197).

As for \*-o:p and \*-ə:p, and \*-o:m and \*-ə:m, each pair appears in complementary distribution. It is tempting to re-assign \*-o:p to \*-ə:p to fill the gap in the system.

Nevertheless, we will see in Table 200 that the revised \*-ə:- is frequently reflected as -ə- in Huangtong, whereas \*-o:p has -o- as the nucleus reflex. Although \*-o:p should be revised accordingly, it is better not to treat \*-o:p as \*-ə:p. Huangtong also reflects \*-o:m and \*-ə:m differently, so these two proto rhymes are kept apart, with \*-ə:m staying as \*-ə:m in my revised system.



The original \*-o:m demonstrates a different sound correspondence (o:o:o:ɔ:ɔ), compared to \*-um (ɔ:ɔ:ɔ:u:u:u) as illustrated in Table 195. The only other rhyme composed of a round vowel reflex followed by a bilabial coda is \*-əm, as illustrated by ‘night’ and ‘bad (not good)’ where an i:o:o:ɔ:ɔ correspondence is attested. We can see that except for Changliu, the other five varieties have identical reflexes for \*-əm and my original \*-o:m. Note that ‘south’, ‘night’, and ‘bad’ have even-numbered tones. Given that the reflexes in Changliu are occasionally conditioned by tone (cf. \*-ə:n and \*-ə:j), I revise the original \*-o:m and incorporate it into the proposed \*-əm.

**Table 195: ‘The original \*-um’ vs ‘to-be-revised \*-o:m’ vs ‘the original \*-əm’**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇祠)	XY (新盈)	Proto- Ong-Be
撿	‘to pick up’	hɔm <sup>1</sup>	hɔm <sup>1</sup>	hem <sup>1</sup>	hum <sup>1</sup>	hum <sup>1</sup>	hum <sup>1</sup>	*hum <sup>A1</sup>
蛋	‘egg’	nɔm <sup>1</sup>	nam <sup>1</sup>	nem <sup>1</sup>	num <sup>1</sup>	ɲum <sup>1</sup>	zum <sup>1</sup>	*ɲum <sup>A1</sup>
癢	‘itchy’	kɔm <sup>2</sup>	kɔm <sup>2</sup>	kɔm <sup>2</sup>	kum <sup>2</sup>	kum <sup>2</sup>	kum <sup>2</sup>	*kum <sup>A2</sup>
蟹	‘crab’	k <sup>h</sup> ɔm <sup>2</sup>	k <sup>h</sup> ɔm <sup>2</sup>	k <sup>h</sup> ɔm <sup>2</sup>	xum <sup>2</sup>	xum <sup>2</sup>	k <sup>h</sup> um <sup>2</sup>	*k <sup>h</sup> um <sup>A2</sup>
種 (稻)	‘to plant’	zom <sup>1</sup>	zom <sup>1</sup>	zom <sup>1</sup>	zom <sup>1</sup>	lɔm <sup>1</sup>	lɔm <sup>1</sup>	?*zo:m <sup>A1</sup>
矮、低	‘short; low’	ɖom <sup>3</sup>	ɖom <sup>3</sup>	ɖom <sup>3</sup>	ɖom <sup>3</sup>	ɖom <sup>3</sup>	ɖom <sup>3</sup>	?*ɖo:m <sup>BC1</sup>
度	‘measuring unit for length’	tom <sup>1</sup>	tom <sup>1</sup>	tom <sup>35</sup> -t	tɔm <sup>1</sup>	tɔm <sup>1</sup>	tɔm <sup>1</sup>	?*to:m <sup>A1</sup>
南	‘south’	nim <sup>2</sup>	nom <sup>2</sup>	nom <sup>2</sup>	nom <sup>2</sup>	nɔm <sup>2</sup>	nɔm <sup>2</sup>	*nəm <sup>A2</sup>
夜晚	night	kim <sup>4</sup>	kom <sup>4</sup>	kom <sup>4</sup>	kom <sup>4</sup>	kɔm <sup>4</sup>	kɔm <sup>4</sup>	*kəm <sup>BC2</sup>
壞	bad (not good)	tsim <sup>4</sup>	tsom <sup>4</sup>	ts <sup>(h)</sup> om <sup>4</sup>	--	--	--	*tsəm <sup>BC2</sup>

There remain \*-o:p, \*-o:k, \*-o:ɲ, \*-əj, \*-əw, \*-oj and \*-ow to be accounted for. Table 196 shows that except for \*-o:k where Changliu reflects it as -uak, \*-o:p and \*-o:ɲ are reflected with a back round vowel in both Changliu and Huangtong.

**Table 196: The original \*-o:p, \*-o:k and \*-o:ɲ**

Proto-Ong-Be Rhymes	Changliu	Huangtong	Revised Proto-Ong-Be Rhymes
*-o:p	-op; -ɔp	-op	*-up
*-o:k	-uak	-ok	*-uk
*-o:ɲ	-ɔɲ	-oɲ	*-uɲ

The only rhyme groups that constantly reflect a proto vowel as [+round] in both Changliu and Huangtong are those containing \*-u:- or \*-u- as presented in Table 197. Since my original system shows gaps in \*-up, \*-uk, \*-uʔ, \*-uŋ, and \*-uj, I revise the original \*-o:p, \*-o:k, and \*-o:ŋ as \*-up, \*-uk, and \*-uŋ.

**Table 197: The original \*-u:- and \*-u-**

Proto-Ong-Be	Changliu	Huangtong	Proto-Ong-Be	Changliu	Huangtong
*-u:p	-up	-up	No *-up	--	--
*-u:t	-ut (Longtang)	-ut	*-ut	-ot (Longtang)	-ut
*-u:k	-uk	-uk	No *-uk	--	--
*-u:ʔ	-uʔ	-uʔ	No *-uʔ	--	--
*-u:m	-um	-um	*-um	-om	-um
*-u:n	-un	-un	*-un	-on; -an	-un
*-u:ŋ	-uŋ	-uŋ	No *-uŋ	--	--
*-u:j	-uj; -oj	-uj	No *-uj	--	--

With respect to \*-əj and \*-əw, these show a regular correspondence identical to \*-əm and \*-ən where Changliu has a mid front vowel in contrast to the mid back vowel in Huangtong (see Table 198). \*-əj and \*-əw remain unchanged in the revised system. As for \*-oj and \*-ow, I propose that they resulted from diphthongization of \*-i:# and \*-u:# respectively to fill in the gap.

**Table 198: The distribution of the original \*-əj and \*-oj, and \*-əw and \*-ow**

Proto-Ong-Be	Changliu	Huangtong	Proto-Ong-Be	Changliu	Huangtong
*-oj	-oj	-oj	*-əj	-ej	-oj
*-ow	-ow	-ow	*-əw	-ew	-ow

However, there are a few cases where the reconstruction of \*-o: seems necessary.

Table 199 lists five lexical items that show a regular o:o:o:o:o correspondence across the selected varieties. A conditioning environment is not attested, by comparison with the new \*-ən where the rounding effect is found only after *k*-. Among these five words, ‘pants’, ‘zongzi’ and ‘lime’ are of non-Kra-Dai origin, although they are reconstructible to Proto-Ong-Be.

**Table 199: \*-o:**

Chinese	English	CL (長流)	YX (永興)	LT (龍塘)	QT (橋頭)	HT (皇桐)	XY (新盈)	Proto- Ong-Be
湯	'soup'	ho <sup>3</sup>	so <sup>3</sup>	so <sup>3</sup>	so <sup>3</sup>	so <sup>3</sup>	so <sup>3</sup>	*so: BC1
褲子	'pants'	k <sup>h</sup> o <sup>3</sup>	k <sup>h</sup> o <sup>3</sup>	k <sup>h</sup> o <sup>3</sup>	xo <sup>3</sup>	xo <sup>3</sup>	k <sup>h</sup> o <sup>3</sup>	*k <sup>h</sup> o: BC1
閹	'to castrate'	ɗon <sup>1</sup>	ɗon <sup>1</sup>	ɗon <sup>1</sup>	ɗon <sup>1</sup>	ɗon <sup>1</sup>	ɗon <sup>1</sup>	*ɗo:n A1
粽子	'zongzi'	ʔot <sup>7</sup>	ʔot <sup>7</sup>	ʔot <sup>7</sup>	ʔot <sup>7</sup>	ʔot <sup>7</sup>	ʔot <sup>7</sup>	*ʔo:t D1
石灰	'lime'	hoj <sup>1</sup>	hoj <sup>1</sup>	hoj <sup>1</sup>	hoj <sup>1</sup>	hoj <sup>1</sup>	hoj <sup>1</sup>	*ho:j A1

It is also necessary to tentatively reconstruct \*-e in order to account for the eight words given in Table 165 - Table 167. Ostapirat (2017, p.c.) stated that Proto-Ong-Be \*-e:# could have originated from pre-Proto-Ong-Be \*-a:j, but this cannot be determined without referring to external evidence, cf. 'intestine' which is \*ara:i<sup>C</sup> (Ostapirat 2009) or \*ra:yʔ (Norquest 2007) in Proto-Hlai, \*saj<sup>C</sup> in Proto-Tai (Pittayaporn 2009), and \*khja:i<sup>3</sup> (Thurgood 1988) in Proto-Kam-Sui.

### 6.5. Interim remarks

A revised rhyme table is given in Table 200 with the shaded areas indicating my new proposal (exclusive of \*o:, \*e: and \*i(:) due to their limited distribution). In short, Western Ong-Be better preserves the vowel quality of Proto-Ong-Be while losing the early quantity contrast. Eastern Ong-Be, on the other hand, retains more detail on Proto-Ong-Be vowel quantity. Finally, proto short vowels are not reconstructible in open syllables.

For proto cardinal vowels, \*-a:-, \*-i:-, and \*-u:-, their quality has been well retained in closed syllables in today's Ong-Be. Their short counterparts, however, are prone to change, especially in Eastern Ong-Be. For example, \*-a- is often reflected as -a- in Changliu and -e- in Longtang, but -a- in Huangtong and Xinying. And \*-i-, except before a velar coda, has -ɔ- as its reflex in Changliu and -ɔ- or -e- in Longtang, whereas Huangtong and Xinying both reflect \*-i- as -i-, keeping the original quality.

**Table 200: Revised rhymes**

Revised Rhymes	Original Rhymes	Changliu	Huangtong	Revised Rhymes	Original Rhymes	Changliu	Huangtong
*-a:	*-a:	-a	-a	<b>No *-a#</b>	--	--	--
*-a:p	*-a:p	-ap	-ap	*-ap	*-ap	-ap	-ap
<b>No *-a:t</b>	--	--	--	*-at	*-at	-at	-at
*-a:k	*-a:k	-ak	-ak	*-ak	*-ak	-ak	-ak
<b>No *-a:ʔ</b>	--	--	--	*-aʔ	*-aʔ	-aʔ	-aʔ
*-a:m	*-a:m	-am	-am	*-am	*-am	-am	-am
*-a:n	*-a:n	-an	-an	*-an	*-an	-an	-an
*-a:ŋ	*-a:ŋ	-aŋ	-aŋ	*-aŋ	*-aŋ	-aŋ; -aŋ	-aŋ
*-a:w	*-a:w	-aw	-aw	*-aw	*-aw	-aw; -aw	-aw
*-a:j	*-a:j	-aj	-aj	*-aj	*-aj	-aj	-aj
*-i:#	*-oj	-oj	-oj	<b>No *-i#</b>	--	--	--
<b>No *-i:p</b>	--	--	--	*-ip	*-ip	-op	-ip
*-i:t	*-i:t	-it	-it	*-it	*-it	-ot; -at	-it
*-i:k	*-i:k	-ik (LT)	-ik	(*-ik)	(*-ik)	-ek (LT)	--
(*-i:ʔ)	(*-i:ʔ)	-iʔ	--	*-iʔ	*-iʔ	-uʔ	-iʔ
*-i:m	*-i:m	-im	-im	<b>No *-im</b>	--	--	--
*-i:n	*-i:n	-in	-in	*-in	*-in	-on; -an	-in
*-i:ŋ	*-i:ŋ	-iŋ (LT)	-iŋ	*-iŋ	*-iŋ	-eŋ (LT)	-iŋ
*-i:w	*-i:w	-iw	-iw	<b>No *-iw</b>	--	--	--
*-u:	*-ow	-ow	-ow	<b>No *-u#</b>	--	--	--
*-u:p	*-u:p	-up	-up	*-up	*-o:p	-op; -op	-op
*-u:t	*-u:t	-ut (LT)	-ut	*-ut	*-ut	-ot (LT)	-ut
*-u:k	*-u:k	-uk	-uk	*-uk	*-o:k	-uak	-ok
*-u:ʔ	*-u:ʔ	-uʔ	-uʔ	<b>No *-uʔ</b>	--	--	--
*-u:m	*-u:m	-um	-um	*-um	*-um	-om	-um
*-u:n	*-u:n	-un	-un	*-un	*-un	-on; -an	-un
*-u:ŋ	*-u:ŋ	-uŋ	-uŋ	<b>No *-uŋ</b>	--	--	--
*-u:j	*-u:j	-uj; -oj	-uj	<b>No *-uj</b>	--	--	--
*-ə:#	*-ə:#	-e	-o	<b>No *-ə#</b>	--	--	--
<b>No *-ə:p</b>	--	--	--	*-əp	*-op	-ap	-op
<b>No *-ə:t</b>	--	--	--	*-ət	*-ot	-at; -ot	-ot
*-ə:k	*-ə:k	-ək; -ek	-ək	*-ək	*-ok	-ok	-ok; -ok
*-ə:ʔ	*-ə:ʔ	-əʔ	-əʔ	*-əʔ	*-o:ʔ	-oʔ	-oʔ
*-ə:m	*-ə:m	-om	-əm	*-əm	*-o:m (Tones 1&3)	-om	-om
					*-əm (Tones 2&4)	-im (Tones 2&4)	-om/k__
*-ə:n	*-ə:n	-un; -un/k__ (Tones 1&3)	-ən	*-ən	*on/k__	-on	-on
		-ən (Tones 2&4)	-ən		*-ən	-en	-on
*-ə:ŋ	*-ə:ŋ	-əŋ	-əŋ	*-əŋ	*-oŋ	-oŋ	-oŋ
*-ə:j	*-ə:j	-uj (Tone 1)	-əj	*-əj	*-əj	-ej	-oj
		-ej; -ej (Tones 2-4)	-əj				
*-ə:w	*-ə:w	-əw	-əw	*-əw	*-əw	-ew	-ow

The quality of proto long schwa is well maintained in Western Ong-Be, and is kept relatively intact in Eastern Ong-Be, as exemplified by \*-ə:k > -ək but \*-ə:m > -om in Changliu. As for the proto short schwa, none of the selected varieties reflects it as a schwa. It is frequently reflected as a mid-back round vowel except for Changliu, where \*-ən > -en, \*-əj > -ej, and \*-əw > -ew are observed.

The proposed diphthongs remain unchanged in my new system (see Table 201).

**Table 201: Proto diphthongs**

Proto-Ong-Be	Changliu	Huangtong	Proto-Ong-Be	Changliu	Huangtong
*-ia	-ia	-ia	*-ua	-ua	-ua
No *-iap	--	--	No *-uap	--	--
*-iat	-iat	-iat	*-uat	-uat	-uat
*-iak	-iak	-iak	*-uak	-uak	-uak
No *-ia?	--	--	(*-ua?)	-ua?	-ua?
No *-iam	--	--	No *-uam	--	--
*-ian	-ian	-ian	*-uan	-uan	-uan
*-iaŋ	-iaŋ	-iaŋ	*-uaŋ	-uaŋ	-uaŋ
*-iaw	-iaw; -ew	-ew	No *-uaw	--	--
No *-iaj	--	--	*-uaj	-uaj	-uaj

Even though none of the contemporary Ong-Be varieties shows a vowel length distinction, there is strong evidence to support reconstruction of long and short vowels for Proto-Ong-Be. According to Liang & Zhang (1997:24-25, 34-36, 188-189), in Longtang (龍塘) /ɛ/ corresponds to short vowels in Zhuang (壯) of the Tai branch, whereas /a/ could correspond to either long or short vowels in Zhuang. To put it another way, Tones 1', 7', and 8' in Longtang correspond to Tone 1 (with short vowels), Tone 7 (with short vowels), and 8 (with short vowels) in other Kra-Dai languages that show the vowel length contrast. By contrast, Tones 1, 7, and 8 in Longtang correspond to Tone 1 (with long vowels), Tone 9 (with long vowels), and 10 (with long vowels) in other Kra-Dai languages. Liang & Zhang suggest that the split of Tone 1 is the result of analogy with Tone 7 with which it shares the pitch value.

Liang & Zhang (1997) are correct in mentioning that vowel quantity, rather than quality, plays a more important role in the earlier stage of Ong-Be phonology. I have demonstrated in the aforementioned sections how an early vowel length distinction is associated with vowel quality in modern Ong-Be varieties using Changliu (CL), Longtang (LT), Qiaotou (QT), Huangtong (HT), and Xinying (XY) data. I have also shown the correlation between *early* vowel quantity and tonal splits using Yongxing (YX) and Longtang (LT) as witness varieties. Tonal splits in Yongxing and Longtang, however, do not warrant a reconstruction of Proto-Ong-Be short vowels.

### **6.6. The syllable structure of Proto-Ong-Be**

One of the most challenging issues in the phonological analysis of Ong-Be is to distinguish glides from vowels. Stress and reduplication serve as key witnesses for this distinction in polysyllabic languages with a rich morphology such as Tibetan languages. However, in monosyllabic tonal languages where full reduplication is the norm, reduplication does not provide much information on the status of a vocalic element. Fortunately, word minimality/syllable weight and distributional gaps shed light on the syllable structures as well. In the following sections, I discuss the syllable structure of Proto-Ong-Be and the reconstruction of proto vowels and rhymes using the contemporary data.

Table 202 shows that in this study four proto vowel qualities and two diphthongs \*ia and \*ua can be reconstructed with confidence at the Proto-Ong-Be level, following the syllable canon CV(:)(C)<sup>T</sup> where a diphthong is equal to a long vowel in terms of weight, both bimoraic.

**Table 202: The vowel inventory of Proto-Ong-Be**

	Front	Central	Back
high	i, i:		u, u:
mid		ə, ə:	
low		a, a:	

The reason two off-glides, \*-w and \*-j, are analyzed as glides, and not vowels is because they never co-occur with an obstruent or a nasal in the coda position, as illustrated by the Huangtong (皇桐) data given in Table 203. This phonotactics suggests that these vocalic elements behave like consonants, not vowels.

**Table 203: Huangtong (Western Ong-Be)**

Syllable Structure	Example	English Gloss	Chinese Gloss
CVC	kat <sup>D1</sup>	‘head louse’	頭蝨
CVN	kaŋ <sup>BC1</sup>	‘to speak’	講、說
CVG	kaw <sup>BC1</sup>	‘old (not new)’	舊
<b>NOT</b> attested	kawt, kawŋ, kaut, kauŋ		

By contrast, the decision that diphthongs are not composed of an on-glide plus a vowel is mostly attributed to a distributional gap where these vocalic segments only occur before \*-a-, but not before other vowels such as \*-i- or \*-u-. In other words, \*ia and \*ua should be regarded as a single unit. It is still possible to analyze diphthongs as an on-glide followed by a vowel. But the glide option is less preferable for the following reasons. First, by reconstructing glides, we have to answer the classic question as to whether the glide belongs to onset. Second, by having an on-glide, all consonant clusters in Proto-Ong-Be must be formed by a consonant followed by a semivowel, as illustrated by \*zja/zia<sup>A2</sup> ‘cocount’ and \*zwa/zua<sup>A2</sup> ‘boat’. Simply put, no two [+consonant] segments, like *pl-*, *kr-*, or *sf-*, are allowed in the onset position (cf. *hwa/hua*<sup>BC1</sup> ‘flower’ and *hwan/huan*<sup>A1</sup> ‘lychee’ where two [-consonant] segments are attested). It is better to analyze such a semivowel as a vowel this way. Third, on-glides show distributional gaps

because they never co-occur with a long vowel whether it is in a closed or an open syllable.<sup>78</sup>

There are other advantages in analyzing these vocalic sequences as diphthongs.

Changliu (長流) has /Caʔ/, but no contrastive /Caʔ/, according to Xin (2008:29). As exemplified by /zuaʔ<sup>7</sup>/ (<\*zuaʔ<sup>D1</sup>) ‘firm; hard’, /Cuaʔ/ is attested in Changliu, which only occurs after -u-, however. If I analyzed -u- as -w-, I would need to explain why /aʔ/ only occurs after a CG- sequence. I also need to decide if on-glides belong to onset or rhyme, or if they occupy a mora. By considering the vocalic sequence a diphthong, all the issues raised above are successfully addressed. It is noteworthy that regardless of notational differences, on-glides do not contrast with vowels.

The diphthong strategy accounts for syllable weight and the distributional gaps in Proto-Ong-Be. I answer the question as to whether on-glides belong to onset or rhyme by reconstructing diphthongs, not on-glides. When it comes to reconstructing early vowel length distinctions, the diphthong strategy saves us troubles when tonal splits provide no cue, and when tonal split and vowel reflexes do not agree in terms of proto vowel quantity.

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<sup>78</sup> Of course, one can argue that it is because a glide and a vowel equal to a diphthong in terms of weight, if we consider the glide as part of the rhyme.



## Chapter 7. Conclusion

In this study, I have reconstructed the phoneme inventory and associated lexical items for Proto-Ong-Be using the comparative method. I have also proposed that the Ong-Be cluster can be divided into two subgroups, using vowel reflexes and lexical innovations as principal criteria. In addition, I have argued that the so-called Ong-Be, a.k.a.

*Lingao* 臨高話 in Chinese, consists of at least two languages with multiple dialects.

Below I begin with an overview of my reconstructed consonants and vowels in §7.1 and §7.2., and summarize the correlation between tonal splits and the vowel length in §7.3. I then present the shared innovations used for subgrouping in §7.4., followed by a closing remark in §7.5.

### 7.1. Proto onsets and codas

Thirty-four initials are proposed for Proto-Ong-Be, with the syllable structure of CV(:)(C)<sup>T</sup>.

A summary of this inventory is given in Table 204. Proto-Ong-Be, which was monosyllabic and tonal, did not allow consonant clusters in onset or coda positions.

Table 204 also shows that aspiration was phonemic in velar stops in Proto-Ong-Be.

**Table 204: Proto-Ong-Be initials**

	bilabial	labiodental	alveolar	alveolopalatal	velar	glottal
<b>stops</b>	*p <sup>h1</sup> *p <sup>h2</sup>		*t <sup>1</sup> *t <sup>2</sup>		*k <sup>1</sup> *k <sup>2</sup> *k <sup>h1</sup> *k <sup>h2</sup>	*ʔ <sup>1</sup>
<b>implosives</b>	*ɓ <sup>1</sup> *ɓ <sup>2</sup>		*ɗ <sup>1</sup> *ɗ <sup>2</sup>			
<b>nasals</b>	*m <sup>1</sup> *m <sup>2</sup>		*n <sup>1</sup> *n <sup>2</sup>	*ɲ <sup>1</sup> *ɲ <sup>2</sup>	*ŋ <sup>1</sup> *ŋ <sup>2</sup>	
<b>fricatives</b>		*v <sup>1</sup> *v <sup>2</sup>	*s <sup>1</sup> *s <sup>2</sup> *z <sup>1</sup> *z <sup>2</sup>	*ʃ <sup>1</sup> *ʃ <sup>2</sup>		*h <sup>1</sup> *h <sup>2</sup>
<b>affricates</b>			*ts <sup>1</sup> *ts <sup>2</sup>			
<b>laterals</b>			*l <sup>1</sup> *l <sup>2</sup>			

The inventory of initials of most contemporary Ong-Be varieties resembles that of their ancestor as given above, except for bilabial and velar aspirates, which have have

weakened to fricatives in some others. The proto initials and their modern reflexes are presented in Table 205. In short, the voicing contrast of Pre-Proto-Ong-Be has been neutralized, and only the tonal series originally associated with initial consonants reflect that early voicing contrast are reconstructible in Proto-Ong-Be. At the segmental level, the sonorant reflexes of \*m<sup>1</sup>, \*m<sup>2</sup>, \*n<sup>1</sup>, \*n<sup>2</sup>, \*ɲ<sup>1</sup>, \*ɲ<sup>2</sup>, \*ŋ<sup>1</sup>, \*ŋ<sup>2</sup>, \*l<sup>1</sup>, and \*l<sup>2</sup> are all voiced, and the reflexes of aspirates \*p<sup>h1</sup>, \*p<sup>h2</sup>, \*k<sup>h1</sup>, \*k<sup>h2</sup>, \*ts<sup>1</sup>, and \*ts<sup>2</sup> are all voiceless. As for unaspirated initial stops, their voicing varies according to the place of articulation. The bilabial stops \*b<sup>1</sup> and \*b<sup>2</sup> are voiced and imploded, whereas the velar stops \*k<sup>1</sup> and \*k<sup>2</sup> are voiceless. With respect to coronal stops, \*d<sup>1</sup> and \*d<sup>2</sup> are voiced, but \*t<sup>1</sup> and \*t<sup>2</sup> are voiceless. When external evidence is consulted, it can be seen that the Proto-Ong-Be initial voiceless coronal stops originated from Proto-Kra-Dai palatalized velar stops. Hence, the reflexes of \*k<sup>1</sup>, \*k<sup>2</sup>, \*t<sup>1</sup>, and \*t<sup>2</sup>, i.e., /k/ and /t/, agree in voicing, both of which have voiceless reflexes.

**Table 205: Proto initials and their reflexes (tonal series included)**

Protoform	Modern reflexes	Protoform	Modern reflexes	Protoform	Modern reflexes
*m <sup>1</sup> -	/m <sup>1</sup> /	*ɹ <sup>1</sup> -	/z <sup>1</sup> / or /ɹ <sup>1</sup> /	*b <sup>1</sup> -	/b <sup>1</sup> /
*m <sup>2</sup> -	/m <sup>2</sup> /	*ɹ <sup>2</sup> -	/z <sup>2</sup> / or /ɹ <sup>2</sup> /	*b <sup>2</sup> -	/b <sup>2</sup> /
*n <sup>1</sup> -	/n <sup>1</sup> /	*s <sup>1</sup> -	/s <sup>1</sup> /	*d <sup>1</sup> -	/d <sup>1</sup> /
*n <sup>2</sup> -	/n <sup>2</sup> /	*h <sup>1</sup> -	/h <sup>1</sup> /	*d <sup>2</sup> -	/d <sup>2</sup> /
*ɲ <sup>1</sup> -	/ɲ <sup>1</sup> /, /n <sup>1</sup> /, or /ɹ <sup>1</sup> /	*h <sup>2</sup> -	/h <sup>2</sup> /	*t <sup>1</sup> -	/t <sup>1</sup> /
*ɲ <sup>2</sup> -	/ɲ <sup>2</sup> /, /n <sup>2</sup> /, or /ɹ <sup>2</sup> /	*p <sup>h1</sup> -	/p <sup>h1</sup> / or /f <sup>1</sup> /	*t <sup>2</sup> -	/t <sup>2</sup> /
*ŋ <sup>1</sup> -	/ŋ <sup>1</sup> /	*p <sup>h2</sup> -	/p <sup>h2</sup> / or /f <sup>2</sup> /	*k <sup>1</sup> -	/k <sup>1</sup> /
*ŋ <sup>2</sup> -	/ŋ <sup>2</sup> /	*ts <sup>1</sup> -	/ts <sup>(h)1</sup> /	*k <sup>2</sup> -	/k <sup>2</sup> /
*v <sup>1</sup> -	/v <sup>1</sup> / or /b <sup>1</sup> /	*ts <sup>2</sup> -	/ts <sup>(h)2</sup> /	*ʔ <sup>1</sup> -	/ʔ <sup>1</sup> /
*v <sup>2</sup> -	/v <sup>2</sup> / or /b <sup>2</sup> /	*k <sup>h1</sup> -	/k <sup>h1</sup> / or /x <sup>1</sup> /	*l <sup>1</sup> -	/l <sup>1</sup> /
*z <sup>1</sup> -	/l <sup>1</sup> / or /z <sup>1</sup> /	*k <sup>h2</sup> -	/k <sup>h2</sup> / or /x <sup>2</sup> /	*l <sup>2</sup> -	/l <sup>2</sup> /
*z <sup>2</sup> -	/l <sup>2</sup> / or /z <sup>2</sup> /	--	--	--	--

Table 206 shows the mergers and splits of proto initials in the selected daughter languages. The \*ɹ<sup>1</sup>- and \*ɹ<sup>2</sup>- merged with \*z<sup>1</sup>- and \*z<sup>2</sup>- in the eastern subgroup, but with

\*l<sup>1</sup>- and \*l<sup>2</sup>- in the western subgroup. The alternating reflexes observed in Huangtong (also see Table 88 and Table 89) are due to language contact, because the varieties to the east of Huangtong reflect \*ʐ<sup>1</sup>- and \*ʐ<sup>2</sup>- as z-, whereas the varieties to the west of it reflect these two proto initials as /-/. In addition, \*ŋ<sup>1</sup>- and \*ŋ<sup>2</sup>- have merged with \*n<sup>1</sup>- and \*n<sup>2</sup>- in the eastern subgroup, while this distinction is maintained in most of the varieties of the western subgroup (excluding the Qiaotou variety I investigated). In Changliu, \*b<sup>1</sup>-, \*b<sup>2</sup>-, \*v<sup>1</sup>-, and \*v<sup>2</sup>- have all merged as ɸ-. As for the bilabial and velar aspirated stops, they remain as an aspirated stop in Longtang and Changliu, both of which belong to the eastern subgroup, but are spirantized as homorganic fricatives in most varieties in the western subgroup (except for Xinying, Meiliang, and Diaolou). Qiaotou Town in Chengmai County, which is located in the transition zone between two subgroups, shows traits from each subgroup, even though I classify it as a member of the western subgroup.

**Table 206: Some reflexes in Eastern Ong-Be and Western Ong-Be varieties**

Proto initial	Longtang	Changliu	Qiaotou	Huangtong	Xinying
*b <sup>1</sup> -	/b <sup>1</sup> /	/b <sup>1</sup> /	/b <sup>1</sup> /	/b <sup>1</sup> /	/b <sup>1</sup> /
*b <sup>2</sup> -	/b <sup>2</sup> /	/b <sup>2</sup> /	/b <sup>2</sup> /	/b <sup>2</sup> /	/b <sup>2</sup> /
*v <sup>1</sup> -	/v <sup>1</sup> /	/b <sup>1</sup> /	/v <sup>1</sup> /	/v <sup>1</sup> /	/v <sup>1</sup> /
*v <sup>2</sup> -	/v <sup>2</sup> /	/b <sup>2</sup> /	/v <sup>2</sup> /	/v <sup>2</sup> /	/v <sup>2</sup> /
*l <sup>1</sup> -	/l <sup>1</sup> /	/l <sup>1</sup> /	/l <sup>1</sup> /	/l <sup>1</sup> /	/l <sup>1</sup> /
*l <sup>2</sup> -	/l <sup>2</sup> /	/l <sup>2</sup> /	/l <sup>2</sup> /	/l <sup>2</sup> /	/l <sup>2</sup> /
*z <sup>1</sup> -	/z <sup>1</sup> /	/z <sup>1</sup> /	/z <sup>1</sup> /	/ʐ <sup>1</sup> /~ /l <sup>1</sup> /	/l <sup>1</sup> /
*z <sup>2</sup> -	/z <sup>2</sup> /	/z <sup>2</sup> /	/z <sup>2</sup> /	/ʐ <sup>2</sup> /~ /l <sup>2</sup> /	/l <sup>2</sup> /
*ʐ <sup>1</sup> -	/z <sup>1</sup> /	/z <sup>1</sup> /	/z <sup>1</sup> /	/ʐ <sup>1</sup> /	/ʐ <sup>1</sup> /
*ʐ <sup>2</sup> -	/z <sup>2</sup> /	/z <sup>2</sup> /	/z <sup>2</sup> /	/ʐ <sup>2</sup> /	/ʐ <sup>2</sup> /
*n <sup>1</sup> -	/n <sup>1</sup> /	/n <sup>1</sup> /	/n <sup>1</sup> /	/n <sup>1</sup> /	/n <sup>1</sup> /
*n <sup>2</sup> -	/n <sup>2</sup> /	/n <sup>2</sup> /	/n <sup>2</sup> /	/n <sup>2</sup> /	/n <sup>2</sup> /
*ŋ <sup>1</sup> -	/n <sup>1</sup> /	/n <sup>1</sup> /	/n <sup>1</sup> /	/ŋ <sup>1</sup> /	/ʐ <sup>1</sup> /
*ŋ <sup>2</sup> -	/n <sup>2</sup> /	/n <sup>2</sup> /	/n <sup>2</sup> /	/ŋ <sup>2</sup> /	/ʐ <sup>2</sup> /
*p <sup>h1</sup> -	/p <sup>h1</sup> /	/p <sup>h1</sup> /	/f <sup>1</sup> /	/f <sup>1</sup> /	/p <sup>h1</sup> /
*p <sup>h2</sup> -	/p <sup>h2</sup> /	/p <sup>h2</sup> /	/f <sup>2</sup> /	/f <sup>2</sup> /	/p <sup>h2</sup> /
*k <sup>h1</sup> -	/k <sup>h1</sup> /	/k <sup>h1</sup> /	/x <sup>1</sup> /	/x <sup>1</sup> /	/k <sup>h1</sup> /
*k <sup>h2</sup> -	/k <sup>h2</sup> /	/k <sup>h2</sup> /	/x <sup>2</sup> /	/x <sup>2</sup> /	/k <sup>h2</sup> /

Proto-Ong-Be finals include nasals (\*-m, \*-n, and \*-ŋ), glides (\*-w and \*-j), and unreleased voiceless stops (\*-p, \*-t, \*-k, and \*-ʔ). As demonstrated in Table 207, these proto finals are well-preserved in contemporary Ong-Be varieties. Sporadic changes are observed, however. It is worth mentioning that the glottal stop in contemporary Ong-Be is a reflex of Proto-Kra-Dai \*-c (see Ostapirat 2009).

**Table 207: Proto-Ong-Be finals**

	<b>bilabial</b>	<b>alveolar</b>	<b>palatal</b>	<b>velar</b>	<b>glottal</b>
nasal	*-m	*-n		*-ŋ	
stops	*-p	*-t		*-k	*ʔ
approximants	*-w		*-j		

With regard to the sound change mechanisms in Ong-Be, several sound changes were triggered by spirantization (see Table 208) and depalatalization (see Table 209), which shaped Ong-Be into its modern forms.

Table 208 shows that it has been observed that \*p<sup>h1</sup>- and \*p<sup>h2</sup> became *f*- and \*k<sup>h1</sup>- and \*k<sup>h2</sup>- became *x*- in varieties spoken outside Haikou City, except for Xinying, Meiliang, and Diaolou in Lingao.

**Table 208: Spirantization**

<b>Protoform</b>	<b>Modern reflexes</b>
*p <sup>h1</sup> -	/f/
*p <sup>h2</sup> -	/f/
*k <sup>h1</sup> -	/x/
*k <sup>h2</sup> -	/x/

Regarding depalatalization, the proto palatalized nasals (\*ŋ<sup>1</sup>- and \*ŋ<sup>2</sup>-) and fricatives (\*ʒ<sup>1</sup>- and \*ʒ<sup>2</sup>-) have both depalatalized, becoming *n*- and *z*-, respectively, in most modern Ong-Be varieties, but palatalization remains intact in the varieties spoken in Lingao County.

**Table 209: Depalatalization**

Protoform	Longtang	Changliu	Qiaotou	Huangtong	Xinying
* <b>ŋ</b> <sup>1</sup> -	/n <sup>1</sup> /	/n <sup>1</sup> /	/n <sup>1</sup> /	/ŋ <sup>1</sup> /	/ɲ <sup>1</sup> /
* <b>ŋ</b> <sup>2</sup> -	/n <sup>2</sup> /	/n <sup>2</sup> /	/n <sup>2</sup> /	/ŋ <sup>2</sup> /	/ɲ <sup>2</sup> /
* <b>ʒ</b> <sup>1</sup> -	/z <sup>1</sup> /	/z <sup>1</sup> /	/z <sup>1</sup> /	/ʒ <sup>1</sup> /	/ʒ <sup>1</sup> /
* <b>ʒ</b> <sup>2</sup> -	/z <sup>2</sup> /	/z <sup>2</sup> /	/z <sup>2</sup> /	/ʒ <sup>2</sup> /	/ʒ <sup>2</sup> /

## 7.2. Proto vowels

Generally speaking, Proto-Ong-Be long vowels have either shortened or diphthongized in contemporary Ong-Be varieties. With respect to Proto-Ong-Be short vowels, their original qualities tend to change in Eastern Ong-Be, but are maintained in Western Ong-Be.

The Proto-Ong-Be vowel inventory in Table 210 consists of eight monophthongs (with contrastive length) and two diphthongs, which can be reconstructed with confidence. While all proto long vowels are reconstructible in open syllables, none of the proto short vowels can be reconstructed. Nevertheless, all proto vowels are attested in closed syllables.

**Table 210: The vowel inventory of Proto-Ong-Be**

	Front	Central	Back
<b>high</b>	i, i:		u, u:
<b>mid</b>		ə; ə:	
<b>low</b>		a, a:	

ia      ua

The early vowel length distinction is no longer attested directly in contemporary Ong-Be. Instead, it is reflected as a vowel quality distinction in the eastern Ong-Be subgroup, and is mostly unseen in Western Ong-Be. Using proto low vowels to illustrate, \***ba:k**<sup>D1</sup> ‘mouth’ and \***ba:k**<sup>D2</sup> ‘lunch’ are reflected as *bak*<sup>7</sup> ‘mouth’ and *bak*<sup>8</sup> ‘lunch’ in Changliu (長流), but as *bak*<sup>7</sup> ‘mouth’ and *bak*<sup>8</sup> ‘lunch’ in Xinying (新盈). It is noteworthy that reflexes of \*-a:-, \*-a-, \*-i:-, and \*-i-, and some of \*-u:- and \*-u- have shown a pattern in which

western varieties tend to maintain the quality of proto vowels while losing their length contrast, as illustrated in the shaded areas in Table 211. By contrast, eastern varieties tend to reflect early vowel quantity via different vowel qualities, and only the quality of proto long vowels is more likely to be retained than that of their short counterparts.

**Table 211: Contrastive vowel length and their modern reflexes**

Chinese	English	Changliu (長流)	Longtang (龍塘)	Huangtong (皇桐)	Xinying (新盈)	Proto- Ong-Be
扁擔	‘shoulder pole’	ban <sup>2</sup>	van <sup>2</sup>	van <sup>2</sup>	van <sup>2</sup>	*va:n <sup>A2</sup>
風	‘wind’	ban <sup>3</sup>	van <sup>3</sup>	van <sup>3</sup>	van <sup>3</sup>	*van <sup>BC1</sup>
魚鉤	‘fish hook’	tin <sup>3</sup>	tin <sup>3</sup>	tin <sup>3</sup>	tin <sup>3</sup>	*ti:n <sup>BC1</sup>
牙齒	‘tooth’	tɔn <sup>1</sup>	tɛn <sup>1</sup>	tin <sup>1</sup>	tin <sup>1</sup>	*tin <sup>A1</sup>
站	‘to stand’	zun <sup>1</sup>	zun <sup>1</sup>	ɲun <sup>1</sup>	zun <sup>1</sup>	*ʒu:n <sup>A1</sup>
路	‘road’	sɔn <sup>1</sup>	sɛn <sup>1</sup>	sun <sup>1</sup>	sun <sup>1</sup>	*sun <sup>A1</sup>

The quality of the Proto-Ong-Be central vowel is well retained if it is long, but the contrastive length is lost (see Table 212). The quality of the proto short central vowel, however, has been lost in all the varieties investigated in this study and is reflected as a mid back rounded vowel (exclusive of Changliu, where this mid back rounded vowel reflex has been further changed to a mid front unrounded vowel, as illustrated by ‘heavy’ and ‘seed’).

**Table 212: Reflexes of the proto central vowels**

Chinese	English	Changliu (長流)	Longtang (龍塘)	Huangtong (皇桐)	Xinying (新盈)	Proto- Ong-Be
柴	‘firewood’	bən <sup>2</sup>	vən <sup>2</sup>	vən <sup>2</sup>	vən <sup>2</sup>	*və:n <sup>A2</sup>
辣	‘spicy’	--	kən <sup>2</sup>	kən <sup>2</sup>	kən <sup>2</sup>	*kə:n <sup>A2</sup>
重	‘heavy’	kʰɛn <sup>1</sup>	kʰɔn <sup>1</sup>	xɔn <sup>1</sup>	kʰɔn <sup>1</sup>	*kʰɛn <sup>A1</sup>
種子	‘seed’	bɛn <sup>2</sup>	vɔn <sup>2</sup>	vɔn <sup>2</sup>	vɔn <sup>2</sup>	*vɛn <sup>A2</sup>

It is demonstrated in Table 213 that proto long high vowels, \*i: and \*u:, have become diphthongized in open syllables. While Proto-Ong-Be \*ə: is reflected as a mid vowel in open syllables, Proto-Ong-Be \*a: is reflected as /a/ in all modern Ong-Be varieties.

**Table 213: Proto long vowels and their modern reflexes**

Chinese	English	Changliu (長流)	Longtang (龍塘)	Huangtong (皇桐)	Xinying (新盈)	Proto- Ong-Be
膽	'gall bladder'	zɔj <sup>1</sup>	zej <sup>1</sup>	zɔj <sup>1</sup>	lɔj <sup>1</sup>	*zi: A1
貝類	'shellfish'	hɔj <sup>1</sup>	hej <sup>1</sup>	hɔj <sup>1</sup>	hɔj <sup>1</sup>	*hi: A1
遠	'far'	lɔj <sup>1</sup>	lej <sup>1</sup>	lɔj <sup>1</sup>	lɔj <sup>1</sup>	*li: A1
拿	'to hold'	ʔow <sup>1</sup>	ʔɔ <sup>1</sup>	ʔow <sup>1</sup>	--	*ʔu: A1
尿	'urine'	zow <sup>1</sup>	zew <sup>1</sup>	zow <sup>1</sup>	low <sup>1</sup>	*zu: A1
柱子	'pillar'	--	hew <sup>1</sup>	how <sup>1</sup>	how <sup>1</sup>	*hu: A1
葉	'leaf'	bɛ <sup>2</sup>	bɔ <sup>2</sup>	bɔ <sup>2</sup>	bɔ <sup>2</sup>	*bɛ: A2
村子	'village'	bɛ <sup>3</sup>	vɔ <sup>3</sup>	vɔ <sup>3</sup>	vɔ <sup>3</sup>	*vɛ: BC1
屁股	'buttock'	-mɛ <sup>4</sup>	-mɔ <sup>4</sup>	-mɔ <sup>4</sup>	-mɔ <sup>4</sup>	*mɛ: BC2
魚	'fish'	bɑ <sup>1</sup>	bɑ <sup>1</sup>	bɑ <sup>1</sup>	bɑ <sup>1</sup>	*bɑ: A1
大腿	'thigh'	-bɑ <sup>2</sup>	-vɑ <sup>2</sup>	-vɑ <sup>2</sup>	-vɑ <sup>2</sup>	*vɑ: A2
雲	'cloud'	bɑ <sup>4</sup>	bɑ <sup>4</sup>	bɑ <sup>4</sup>	bɑ <sup>4</sup>	*bɑ: BC2

### 7.3. Tonal splits and phonemic vowel length

Tonal splits are observed in a few Ong-Be varieties spoken in Haikou City, such as Longtang, Longquan, Longqiao, Yongxing, and Shishan. Table 214 shows that tonal splits in the above-mentioned varieties are correlated with vowel length. For instance, the tonal split is only attested in 'lunch' and 'deaf', which contain a proto short vowel \*-a-.

**Table 214: Tonal splits in rhymes with a low vowel**

Chinese	English	Changliu (長流)	Yongxing (永興)	Longtang (龍塘)	Proto- Ong-Be
嘴	'mouth'	bak <sup>7</sup>	bak <sup>7</sup>	bak <sup>7</sup>	*ba:k D1
果實	'fruit'	mak <sup>8</sup>	mak <sup>8</sup>	mak <sup>8</sup>	*ma:k D2
中餐	'lunch'	bak <sup>8</sup>	bak <sup>8</sup>	bɛk <sup>8</sup> 'breakfast'	*bak D2
聾	'deaf'	mak <sup>8</sup>	mak <sup>8</sup>	mek <sup>8</sup>	*mak D2

However, it cannot be emphasized too strongly that tonal splits only reflect the vowel quantity at the time of the split, not necessarily the vowel quantity prior to the occurrence of the tonal split, namely the Proto-Ong-Be vowel quantity. As demonstrated in Table 215, Yongxing and Longtang both show a tonal split in 'to wash (hands)' and 'cocoon' where a proto long vowel is reconstructed (cf. 'sprout', where a proto long

vowel is not accompanied by a tonal split). On the other hand, the lexical items ‘pomelo’, ‘bird’, and ‘deer’, contain a proto short vowel, but the tonal split is not observed.

**Table 215: Tonal splits and vowel length**

Chinese	English	Changliu (長流)	Yongxing (永興)	Longtang (龍塘)	Proto- Ong-Be
洗 (手)	‘to wash (hands)’	tuk <sup>7</sup>	tuk <sup>7</sup>	tuk <sup>7</sup>	*tu:k <sup>D1</sup>
繭	‘cocoon’	luk <sup>7</sup>	luk <sup>7</sup>	luk <sup>7</sup>	*lu:k <sup>D1</sup>
芽	‘sprout’	ɲuk <sup>8</sup>	ɲuk <sup>8</sup>	ɲuk <sup>8</sup>	*ɲu:k <sup>D2</sup>
柚子	‘pomelo’	-ɲuak <sup>8</sup>	-ɲok <sup>8</sup>	-ɲok <sup>8</sup>	*ɲuk <sup>D2</sup>
鳥	‘bird’	nuak <sup>8</sup>	nok <sup>8</sup>	nok <sup>8</sup>	*nuk <sup>D2</sup>
鹿	‘deer’	tsuak <sup>8</sup>	tsok <sup>8</sup>	tsok <sup>8</sup>	*tsuk <sup>D2</sup>

#### 7.4. Internal subgrouping

Modern Ong-Be can be divided into two subgroups, Eastern Ong-Be and Western Ong-Be, based on shared phonological innovations in the reflexes of proto short vowels in certain rhymes as well as shared lexical innovations. As seen in Table 216, in the western Ong-Be subgroup \*-ip, \*-it, and \*-in are reflected with /i/, but the eastern Ong-Be subgroup reflects these rhymes with a low back vowel nucleus. Also the rhymes \*-um and \*-un are reflected as /um/ and /un/ in Western Ong-Be, whereas a low vowel reflex is seen in Eastern Ong-Be.

**Table 216: Shared phonological innovations**

Chinese Gloss	English Gloss	Longtang (龍塘)	Changliu (長流)	Huangtong (皇桐)	Xinying (新盈)	Proto- Ong-Be
生	‘raw’	zɔp <sup>7</sup>	zɔp <sup>7</sup>	zip <sup>7</sup>	lip <sup>7</sup>	*zip <sup>D1</sup>
香菇、蕈類	‘mushroom’	hat <sup>8</sup>	lot <sup>8</sup> -i	hit <sup>8</sup>	hit <sup>8</sup>	*hit <sup>D2</sup>
牙齒	‘tooth’	tɛn <sup>1</sup>	tɔn <sup>1</sup>	tin <sup>1</sup>	tin <sup>1</sup>	*tin <sup>A1</sup>
蛋	‘egg’	nɛm <sup>1</sup>	nɔm <sup>1</sup>	ɲum <sup>1</sup>	zum <sup>1</sup>	*ɲum <sup>A1</sup>
雨	‘rain’	p <sup>h</sup> ɛn <sup>1</sup>	p <sup>h</sup> an <sup>1</sup>	fun <sup>1</sup>	p <sup>h</sup> un <sup>1</sup>	*p <sup>h</sup> un <sup>A1</sup>

Shared lexical innovations also divide Ong-Be varieties into two subgroups. For instance, we see in Table 217 that the first two varieties (Longtang and Changliu) and the last two varieties (Huangtong and Xinying) employ different lexical items for ‘hair’, ‘1sg’, ‘door’, and ‘bone’.



**Table 217: Shared lexical innovations**

Chinese Gloss	English Gloss	Longtang (龍塘)	Changliu (長流)	Huangtong (皇桐)	Xinying (新盈)
頭髮	'hair'	-sew <sup>3</sup>	-so <sup>3</sup>	fuj <sup>1</sup>	fuj <sup>1</sup>
我	'1sg'	ze <sup>2</sup>	zia <sup>3</sup> -t	haw <sup>2</sup>	haw <sup>2</sup>
門	'door'	dəw <sup>2</sup>	dɔw <sup>2</sup>	dən <sup>4</sup>	ʔuaʔ <sup>8</sup>
骨頭	'bone'	zik <sup>7</sup>	zək <sup>7</sup>	dən <sup>4</sup>	ʔuaʔ <sup>8</sup>

### 7.5. Closing remarks

This dissertation is the first to present a well-founded reconstruction of Proto-Ong-Be vowels and consonants based on first-hand data, whereas previous discussions on Proto-Ong-Be have focused only on its consonantal system. This dissertation is also the first to subgroup Ong-Be varieties based on shared innovations. In addition, the reconstruction can be the basis for determining the position of Ong-Be within the Kra-Dai language family.

This dissertation serves as a testing ground for different methods of reconstruction. It shows that the gap between the results inferred from the two approaches, the bottom-up approach (based on only data internal to Ong-Be languages) and the top-down approach (comparing Ong-Be with evidence in other Kra-Dai languages outside of Ong-Be), cannot be mended easily when no relevant information is retained, and that the results inferred from the bottom-up approach and the top-down approach reflect different stages of the phonological system at issue. This dissertation also demonstrates that an accommodation has to be made with respect to the identification and reconstruction of suprasegmental contrasts. That is, when discussing the meaning lying behind the tones and the tonal series in Ong-Be, external evidence must be consulted.

The reconstruction of the Proto-Ong-Be phoneme system facilitates the discussion of Ong-Be in the Kra-Dai context. Recent studies show that a contrastive vowel length in

other Kra-Dai languages is a retention from Proto-Kra-Dai. On the other hand, phonemic aspiration, which is attested across the Kra-Dai language family, appears to be the result of drift and not reconstructible to Proto-Kra-Dai. In the case of Ong-Be, Proto-Ong-Be did have phonemic aspiration. Compared with other Kra-Dai languages, which have preserved initial consonant clusters (a retention from disyllabic Proto-Kra-Dai; see Ostapirat 2018 for more details), the phonology of Proto-Ong-Be does not seem to be conservative. Initial consonant clusters cannot be reconstructed, and the earlier voicing contrast associated with initials cannot be distinguished using internal evidence. Moreover, the syllable structure of Proto-Ong-Be is monosyllabic, unlike other Kra-Dai languages (cf. sesquisyllabic Proto-Tai, Proto-Kam-Sui, Proto-Kra, and Proto-Hlai).

The reconstructed core vocabulary demonstrates that the Ong-Be branch belongs to the Kra-Dai language family, even though some of the earlier proposals misclassified it as a variety of Chinese or a mixed language due to methodological flaws. The reconstructed lexicon provides insights into the prehistory of Proto-Ong-Be, suggesting that the early speakers grew foxtail millet, taro, and rice, raised domestic animals (including chickens, ducks, geese, dogs, pigs, and buffalos), wove, and fished. In addition to the Chinese influence, these people were also in close contact with early Hlai speakers, given exclusively shared terms between Ong-Be and Hlai, such as ‘village’ (Proto-Hlai:<sup>79</sup> *\*(?)bau<sup>C</sup>* or *\*baw?* vs. Proto-Ong-Be: *\*və:<sup>BC1</sup>*), ‘egg’ (Proto-Hlai: *\*aji:m<sup>A</sup>* or *\*hju:m* vs. Proto-Ong-Be: *ŋum<sup>A1</sup>*), ‘salt’ (Proto-Hlai: *\*ŋa:u<sup>C</sup>* or *\*C-ŋa:w?* vs. Proto-Ong-Be: *ŋa:w<sup>BC1</sup>*),

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<sup>79</sup> Regarding the Proto-Hlai data, the ones with a tone category are from Ostapirat (2004) and the ones without a tone category are from Norquest (2007).

‘new’ (Proto-Hlai: \*nəu<sup>C</sup> or \*C-nəwʔ vs. Proto-Ong-Be: na:w<sup>BC2</sup>), and ‘cotton’ (Proto-Hlai: \*(ʔ)bu:i<sup>C</sup> or bu:y vs. western-Ong-Be varieties: bu:j<sup>BC1</sup>).

To conclude, based on the data gathered in the field, together with information from published materials, this dissertation provides a clearer picture of the phonological system of Proto-Ong-Be and the subgrouping of these languages, in addition to understanding the history of what happened in the development from Proto-Kra-Dai to Proto-Ong-Be. It also contributes to the study of contemporary Ong-Be with respect to cross-linguistic phonological comparisons, mutual intelligibility, and vitality.

## Appendix I. Ong-Be speaking villages I surveyed

City/County	Township	Village Name
Haikou City/海口市	Longtang/龍塘鎮	Renhe/仁何村; Wencai/文彩村
Haikou City/海口市	Yongxing/永興鎮	Nantao/南道村
Haikou City/海口市	Shishan/石山鎮	Meishe/美社村; Chunteng/春騰村
Haikou City/海口市	Changliu/長流鎮	Qionghua/瓊華村
Chengmai County/澄邁縣	Qiaotou/橋頭鎮	Linshigang/林詩港
Lingao County/臨高縣	Huangtong/皇桐鎮	Wenxian/文顯村
Lingao County/臨高縣	Maniao/博厚鎮馬良區	Yangda/洋大村; Daozao/道灶村
Lingao County/臨高縣	Jialai/加來鎮	Langguan/郎貫村
Lingao County/臨高縣	Xinying/新盈鎮	Cangmi/倉米村
Lingao County/臨高縣	Meiliang/調樓鎮美良區	Kundian/昆殿村

## Appendix II. The Phoneme Inventory of Proto-Ong-Be

The tables below present the phoneme inventory of Proto-Ong-Be. Because the consonant inventory here is based only on internal evidence, the tonal series associated with initial voicing is not included.

Among all the consonants, approximants are found only in the coda position. Proto-Ong-Be does not have \*p as an onset. Based on internal evidence, the coda \*p is in complementary distribution with the onsets \*p<sup>h</sup> and \*b and can be regarded as an allophone of either one. However, these three segments were derived from different sources. When external evidence is referred to, the coda \*p and the onset \*b<sup>1</sup> (> \*b) share the same origin, i.e., Proto-Kra-Dai \*p. The reflexes of Proto-Kra-Dai \*p took different routes, in which the onset reflex in Proto-Ong-Be became imploded, resulting in \*b. The coda reflex, on the other hand, remained unchanged because Kra-Dai languages only allow voiceless and unreleased stop codas.

In short, except for \*w and \*j (and \*p), the rest of the proto consonants are allowed to function as an onset.

	bilabial	labiodental	alveolar	(alveolo-) palatal	velar	glottal
<b>stops</b>	(*p) *p <sup>h</sup>		*t		*k *k <sup>h</sup>	*ʔ
<b>implosives</b>	*b		*ɗ			
<b>nasals</b>	*m		*n	*ɲ	*ŋ	
<b>affricates</b>			*ts			
<b>fricatives</b>		*v	*s *z	*ʃ		*h
<b>laterals</b>			*l			
<b>approximants</b>	*w			*j		

There are four vowel qualities plus a quantity contrast in Proto-Ong-Be. Two diphthongs, \*ia and \*ua, can also be reconstructed to Proto-Ong-Be. Mid vowels \*e: and \*o: as well as the high central vowel \*ɨ:, while attested in a few tokens, do not show a recurrent sound correspondence.

	Front	Central	Back
<b>high</b>	i, i:	(ɨ:)	u, u:
<b>mid</b>	(e:)	ə; ə:	(o:)
<b>low</b>		a, a:	

ia	ua
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### Appendix III. Reconstructed Proto-Ong-Be Etyma

English	Chinese	Proto-Ong-Be	Changliu (長流)	Yongxing (永興)	Longtang (龍塘)	Qiaotou (橋頭)	Huangtong (皇桐)	Xinying (新盈)
<b>1. Flora</b>								
a type of bamboo	某種竹子	kuan <sup>A2</sup>	kuan <sup>2</sup>	maj <sup>4</sup> kuan <sup>2</sup>	kuan <sup>2</sup>	--	kuan <sup>2</sup>	kuan <sup>2</sup>
bamboo shoots	竹筍	na:ŋ <sup>A2</sup>	naŋ <sup>2</sup> hɔn <sup>4</sup>	naŋ <sup>2</sup>	naŋ <sup>2</sup>	naŋ <sup>2</sup>	naŋ <sup>2</sup>	naŋ <sup>2</sup>
banana	香蕉	mum <sup>A2</sup>	mak <sup>8</sup> mun <sup>2</sup>	mak <sup>8</sup> mɔn <sup>2</sup>	mek <sup>8</sup> mɔn <sup>2</sup>	mak <sup>8</sup> mun <sup>2</sup>	mun <sup>2</sup>	mun <sup>2</sup>
chaff	米糠	və: BC2	bɛ <sup>4</sup>	vɔ <sup>4</sup>	vɔ <sup>4</sup>	vɔ <sup>4</sup>	vɔ <sup>4</sup>	vɔ <sup>4</sup>
coconut	椰子	zia <sup>A2</sup>	mak <sup>8</sup> zia <sup>2</sup>	mak <sup>8</sup> zia <sup>2</sup>	mek <sup>8</sup> zia <sup>2</sup>	mak <sup>8</sup> zia <sup>2</sup>	ma <sup>2</sup> zia <sup>2</sup>	ma <sup>2</sup> zia <sup>2</sup>
ear of rice	稻穗	zə:ŋ <sup>A1</sup>	zəŋ <sup>1</sup> ŋaw <sup>4</sup>	ziŋ <sup>1</sup> ŋaw <sup>4</sup>	ziŋ <sup>1</sup>	zəŋ <sup>1</sup>	lən <sup>1</sup> ŋaw <sup>4</sup>	lən <sup>1</sup>
flower	花	hua <sup>A1</sup>	hua <sup>1</sup>	hua <sup>1</sup>	hua <sup>1</sup>	hua <sup>1</sup>	(h)ua <sup>1</sup>	hua <sup>1</sup>
foxtail millet	小米	p <sup>h</sup> a:ŋ BC1	bəŋ <sup>4</sup> laŋ <sup>1</sup>	vaŋ <sup>4</sup> -t	vaŋ <sup>4</sup> -t	faŋ <sup>3</sup>	faŋ <sup>3</sup>	p <sup>h</sup> aŋ <sup>3</sup>
fruit	果實	ma:k D2	mak <sup>8</sup>	mak <sup>8</sup>	mak <sup>8</sup>	mak <sup>8</sup>	mak <sup>8</sup>	mak <sup>8</sup>
garlic	蒜頭	tuan BC1	haw <sup>3</sup> mak <sup>8</sup> tuan <sup>3</sup>	haw <sup>3</sup> mak <sup>8</sup> tuan <sup>3</sup>	haw <sup>3</sup> mek <sup>8</sup> tuan <sup>3</sup>	haw <sup>3</sup> tuan <sup>3</sup>	tuan <sup>3</sup>	tuan <sup>3</sup>
ginger	薑	kiaŋ <sup>A1</sup>	kiaŋ <sup>1</sup>	kiaŋ <sup>1</sup>	kiaŋ <sup>1</sup>	kiaŋ <sup>1</sup>	kiaŋ <sup>1</sup>	kiaŋ <sup>1</sup>
glutinous rice	糯米	naw <sup>A1</sup>	zap <sup>8</sup> naw <sup>1</sup>	zap <sup>8</sup> naw <sup>1</sup>	zep <sup>8</sup> new <sup>1</sup>	zəp <sup>8</sup> naw <sup>1</sup>	zəp <sup>8</sup> naw <sup>1</sup>	lɔp <sup>8</sup> naw <sup>1</sup>
grass	草	bat D1	bat <sup>7</sup>	bat <sup>7</sup>	bat <sup>7</sup>	bat <sup>7</sup>	bat <sup>7</sup>	bat <sup>7</sup>
green onions	蔥	su:ŋ <sup>A1</sup>	mak <sup>8</sup> suŋ <sup>1</sup>	mak <sup>8</sup> soŋ <sup>1</sup>	mek <sup>8</sup> suŋ <sup>1</sup>	suŋ <sup>1</sup>	suŋ <sup>1</sup>	suŋ <sup>1</sup>
husked rice	米	zəp D2	zap <sup>8</sup>	zap <sup>8</sup>	zep <sup>8</sup>	zəp <sup>8</sup>	zəp <sup>8</sup>	lɔp <sup>8</sup>
indigo	藍靛草	tsam <sup>A2</sup>	tsam <sup>2</sup> ' <i>Indigofera suffruticosa</i> '	--	tsam <sup>2</sup> (L&Z)	--	tsam <sup>2</sup> (LC)	--
jackfruit	波羅蜜	miat D2	mak <sup>8</sup> miat <sup>8</sup>	mak <sup>8</sup> miat <sup>8</sup>	mek <sup>8</sup> miat <sup>8</sup>	mak <sup>8</sup> miat <sup>8</sup>	ma <sup>2</sup> miat <sup>8</sup>	ma <sup>2</sup> miat <sup>8</sup>
leaf	葉	bə: A2	bɛ <sup>2</sup>	bɔ <sup>2</sup>	bɔ <sup>2</sup>	bɔ <sup>2</sup>	bɔ <sup>2</sup>	bɔ <sup>2</sup>
longan	龍眼	p <sup>h</sup> ən BC2	mak <sup>8</sup> huan <sup>1</sup> p <sup>h</sup> en <sup>4</sup>	mak <sup>8</sup> p <sup>h</sup> un <sup>4</sup> -v	mek <sup>8</sup> p <sup>h</sup> ɔn <sup>4</sup>	mak <sup>8</sup> fɔn <sup>4</sup> -v	ma <sup>8</sup> fɔn <sup>4</sup>	ma <sup>8</sup> p <sup>h</sup> ɔ <sup>4</sup>
lychee	荔枝	huan <sup>A1</sup>	mak <sup>8</sup> huan <sup>1</sup>	mak <sup>8</sup> huan <sup>1</sup>	mek <sup>8</sup> k <sup>h</sup> uan <sup>1</sup>	mak <sup>8</sup> (h)uan <sup>1</sup>	ma <sup>2</sup> uan <sup>1</sup>	ma <sup>2</sup> huan <sup>1</sup>

English	Chinese	Proto-Ong-Be	Changliu (長流)	Yongxing (永興)	Longtang (龍塘)	Qiaotou (橋頭)	Huangtong (皇桐)	Xinying (新盈)
mulberry leaf	桑葉	bu:n <sup>A2</sup>	be <sup>2</sup> bun <sup>2</sup>	bo <sup>2</sup> bun <sup>2</sup>	bo <sup>2</sup> bun <sup>2</sup>	bo <sup>2</sup> bun <sup>2</sup>	bo <sup>2</sup> bun <sup>2</sup>	--
mushroom	香菇、蕈類	hit <sup>D2</sup>	lot <sup>8</sup> ; hot <sup>8</sup> (Xin)	hot <sup>8</sup> han <sup>3</sup>	hat <sup>8</sup> hən <sup>3</sup>	het <sup>8</sup>	hit <sup>8</sup>	hit <sup>8</sup>
paddy	稻穀、穀粒	mek <sup>D2</sup>	mok <sup>8</sup>	mok <sup>8</sup>	mek <sup>8</sup> -v	mok <sup>8</sup>	mok <sup>8</sup>	mok <sup>8</sup>
panadanus fruit	林投果	za: BC2	mak <sup>8</sup> za <sup>4</sup>	mai <sup>4</sup> za <sup>4</sup>	mai <sup>4</sup> za <sup>4</sup> ; mek <sup>8</sup> za <sup>4</sup>	mak <sup>8</sup> za <sup>4</sup>	la <sup>4</sup>	mak <sup>8</sup> la <sup>4</sup>
papaya	木瓜	zia <sup>A2</sup>	zia <sup>2</sup> p <sup>h</sup> an <sup>1</sup>	--	kia <sup>2</sup> p <sup>h</sup> an <sup>1</sup> ; nja <sup>2</sup> p <sup>h</sup> an <sup>1</sup>	mak <sup>8</sup> zia <sup>2</sup> fan <sup>1</sup>	zia <sup>2</sup> fan <sup>1</sup>	zia <sup>2</sup> p <sup>h</sup> an <sup>1</sup>
pomelo	柚子	ɲuk <sup>D2</sup>	mak <sup>8</sup> ɲuak <sup>8</sup>	mak <sup>8</sup> ɲok <sup>8</sup>	mek <sup>8</sup> ɲok <sup>8</sup>	mak <sup>8</sup> ɲok <sup>8</sup>	mak <sup>2</sup> ɲok <sup>8</sup> (Maniao)	ma <sup>2</sup> ɲok <sup>8</sup>
rattan	白藤	saʔ <sup>D1</sup>	saʔ <sup>7</sup>	saʔ <sup>7</sup>	saʔ <sup>7</sup>	saʔ <sup>7</sup>	saʔ <sup>7</sup>	saʔ <sup>7</sup>
rice in the field	稻	ɲa:w BC2	ɲaw <sup>4</sup>	ɲaw <sup>4</sup>	ɲaw <sup>4</sup>	ɲaw <sup>4</sup>	ɲaw <sup>4</sup>	ɲaw <sup>4</sup>
rice seedling	稻秧	la: BC1	la <sup>3</sup>	la <sup>3</sup>	la <sup>3</sup>	la <sup>3</sup>	la <sup>3</sup>	la <sup>3</sup>
root	樹根	ziak <sup>D2</sup>	--	ziak <sup>8</sup>	ziak <sup>8</sup>	maj <sup>4</sup> zia <sup>8</sup> 'Ficus microcarpa'	ma <sup>2</sup> lia <sup>8</sup> 'Ficus microcarpa'	ma <sup>2</sup> lia <sup>8</sup> 'Ficus microcarpa'
seed	種子	vən <sup>A2</sup>	haw <sup>3</sup> ben <sup>2</sup>	vən <sup>2</sup>	vən <sup>2</sup>	von <sup>2</sup>	vən <sup>2</sup>	vən <sup>2</sup>
sesame	芝麻	vəŋ <sup>A2</sup>	mak <sup>8</sup> bən <sup>2</sup>	mak <sup>8</sup> vən <sup>2</sup>	mek <sup>8</sup> vən <sup>2</sup>	mak <sup>8</sup> vən <sup>2</sup>	ma <sup>2</sup> vən <sup>2</sup>	ma <sup>2</sup> vən <sup>2</sup>
sprout	芽	ɲu:k <sup>D2</sup>	ɲuk <sup>8</sup>	ɲuk <sup>8</sup>	ɲuk <sup>8</sup>	--	--	--
starfruit	楊桃	vian <sup>A1</sup>	mak <sup>8</sup> bian <sup>1</sup>	mak <sup>8</sup> bian <sup>1</sup>	mek <sup>8</sup> bian <sup>1</sup>	mak <sup>8</sup> vian <sup>1</sup>	ma <sup>2</sup> vian <sup>1</sup>	ma <sup>2</sup> vian <sup>1</sup>
straw	稻草	mu:ŋ BC2	mun <sup>4</sup>	mun <sup>4</sup>	mun <sup>4</sup>	mun <sup>4</sup>	mun <sup>4</sup>	mun <sup>4</sup>
sugarcane	甘蔗	maj BC1	maj <sup>3</sup>	maj <sup>3</sup>	maj <sup>3</sup>	maj <sup>3</sup>	maj <sup>3</sup>	maj <sup>3</sup>
taro	芋頭	sa:k <sup>D1</sup>	sak <sup>7</sup>	sak <sup>7</sup>	mek <sup>8</sup> sak <sup>7</sup>	mak <sup>8</sup> sak <sup>7</sup>	ma <sup>2</sup> sak <sup>7</sup>	mak <sup>8</sup> sak <sup>7</sup>
tea	茶	sa: A2	sa <sup>2</sup>	sa <sup>2</sup>	sa <sup>2</sup>	sa <sup>2</sup>	sa <sup>2</sup>	sa <sup>2</sup>
thatch	茅草	tia <sup>A2</sup>	bat <sup>7</sup> tia <sup>2</sup>	bat <sup>7</sup> tia <sup>2</sup>	bat <sup>7</sup> tia <sup>2</sup>	tia <sup>2</sup>	tia <sup>2</sup>	tia <sup>2</sup>
tree	樹	dun BC1	dən <sup>3</sup>	dən <sup>3</sup>	dən <sup>3</sup>	dun <sup>3</sup>	dun <sup>3</sup>	dun <sup>3</sup>
vegetable	菜	sak <sup>D1</sup>	sak <sup>7</sup>	sak <sup>7</sup>	sak <sup>7</sup>	sak <sup>7</sup>	sak <sup>7</sup>	sak <sup>7</sup>
winter melon	冬瓜	ku:p <sup>D1</sup>	mak <sup>8</sup> kup <sup>7</sup>	mak <sup>8</sup> kup <sup>7</sup>	mek <sup>8</sup> kup <sup>7</sup>	kua <sup>1</sup> kup <sup>7</sup>	kua <sup>1</sup> kup <sup>7</sup>	--
<b>2. Fauna</b>								
ant	螞蟻	mu:ʔ <sup>D2</sup>	maj <sup>4</sup> mu <sup>ʔ</sup>	maj <sup>4</sup> mu <sup>ʔ</sup>	maj <sup>4</sup> mo <sup>ʔ</sup>	mu <sup>ʔ</sup>	mu <sup>ʔ</sup>	mu <sup>ʔ</sup>
aquatic leech	水蛭	bi:ŋ <sup>A1</sup>	maj <sup>4</sup> biŋ <sup>1</sup>	maj <sup>4</sup> biŋ <sup>1</sup>	maj <sup>4</sup> biŋ <sup>1</sup>	biŋ <sup>1</sup>	biŋ <sup>1</sup>	biŋ <sup>1</sup>

English	Chinese	Proto-Ong-Be	Changliu (長流)	Yongxing (永興)	Longtang (龍塘)	Qiaotou (橋頭)	Huangtong (皇桐)	Xinying (新盈)
bee	蜜蜂	sa:ŋ <sup>BC1</sup>	saŋ <sup>3</sup>	saŋ <sup>3</sup>	saŋ <sup>3</sup>	saŋ <sup>3</sup>	saŋ <sup>3</sup>	saŋ <sup>3</sup>
big frog	大青蛙、 田雞	kup <sup>D2</sup>	kɔp <sup>8</sup>	kɔp <sup>8</sup>	kep <sup>8'</sup>	ʔop <sup>8</sup>	ʔop <sup>8</sup>	ʔop <sup>8</sup>
bird	鳥	nuk <sup>D2</sup>	nuak <sup>8</sup>	nok <sup>8</sup>	nok <sup>8</sup>	nok <sup>8</sup>	nok <sup>8</sup>	nok <sup>8</sup>
bug; worm	蟲	miŋ <sup>A2</sup>	miŋ <sup>2</sup>	miŋ <sup>2</sup>	mɛŋ <sup>2</sup>	miŋ <sup>2</sup>	miŋ <sup>2</sup>	miŋ <sup>2</sup>
centipede	蜈蚣	zip <sup>D2</sup>	zɔp <sup>8</sup>	maj <sup>4</sup> zɔp <sup>8</sup>	maj <sup>4</sup> zep <sup>8'</sup>	zɛp <sup>8</sup>	zip <sup>8</sup>	lip <sup>8</sup>
chicken	雞	kaj <sup>A1</sup>	kaj <sup>1</sup>	kej <sup>1</sup>	kej <sup>1'</sup>	kaj <sup>1</sup>	kaj <sup>1</sup>	kaj <sup>1</sup>
chicken louse	雞蟲	zi:n <sup>A2</sup>	zen <sup>2</sup>	kaj <sup>1</sup> zin <sup>2</sup> ; maj <sup>4</sup> zin <sup>2</sup>	maj <sup>4</sup> zin <sup>2</sup>	zin <sup>2</sup>	--	--
cockroach	蟑螂	la:p <sup>D1</sup>	k <sup>h</sup> a <sup>3</sup> lap <sup>7</sup>	miŋ <sup>2</sup> k <sup>h</sup> i <sup>3</sup> lap <sup>7</sup>	mɛŋ <sup>2</sup> (ku <sup>2</sup> ) ɬa <sup>55</sup> zap <sup>7</sup>	tsi <sup>2</sup> ʒap <sup>7</sup>	tsia <sup>2</sup> lap <sup>7</sup>	tsia <sup>2</sup> lap <sup>7</sup>
cockscorn	雞冠	ti:w <sup>BC1</sup>	tiw <sup>3</sup> kaj <sup>1</sup>	tiw <sup>3</sup>	tiw <sup>3</sup> ; tiw <sup>3</sup> kej <sup>1'</sup>	tiw <sup>3</sup> ; tiw <sup>3</sup> kaj <sup>1</sup>	tiw <sup>3</sup> (kaj <sup>1</sup> )	tiw <sup>3</sup> kaj <sup>1</sup>
cocoon	繭	lu:k <sup>D1</sup>	luk <sup>7</sup>	luk <sup>7'</sup> nian <sup>2</sup>	luk <sup>7'</sup> nian <sup>2</sup>	--	luk <sup>7</sup> (L&Z)	--
crab	蟹	k <sup>h</sup> um <sup>A2</sup>	k <sup>h</sup> ɔm <sup>2</sup>	k <sup>h</sup> ɔm <sup>2</sup>	k <sup>h</sup> ɔm <sup>2</sup>	xum <sup>2</sup>	xum <sup>2</sup>	k <sup>h</sup> um <sup>2</sup>
crow	烏鴉	ʔa:k <sup>D1</sup>	nuak <sup>8</sup> ʔak <sup>8</sup>	nok <sup>8</sup> ʔak <sup>8</sup>	nok <sup>8</sup> maj <sup>4</sup> ʔak <sup>8</sup>	maj <sup>4</sup> ʔak <sup>8</sup>	maj <sup>4</sup> ʔak <sup>8</sup>	maj <sup>4</sup> ʔak <sup>8</sup>
deer	鹿	tsuk <sup>D2</sup>	tsuak <sup>8</sup>	tsok <sup>8</sup>	tsok <sup>8</sup>	tsok <sup>8</sup>	tsok <sup>8</sup>	tsok <sup>8</sup>
dog	狗	ma: <sup>A1</sup>	ma <sup>1</sup>	ma <sup>1</sup>	ma <sup>1</sup>	ma <sup>1</sup>	ma <sup>1</sup>	ma <sup>1</sup>
duck	鴨子	bit <sup>D1</sup>	bat <sup>7</sup>	bat <sup>7'</sup>	bat <sup>7'</sup>	bət <sup>7</sup>	bit <sup>7</sup>	bit <sup>7</sup>
earthworm	蚯蚓	nəw <sup>A2</sup>	tsɛŋ <sup>4</sup> new <sup>2</sup>	sɔŋ <sup>1</sup> nɔw <sup>2</sup>	sɛŋ <sup>1'</sup> nɔw <sup>2</sup>	nɔw <sup>2</sup>	nɔw <sup>2</sup>	nɔw <sup>2</sup>
egg	蛋	ŋum <sup>A1</sup>	nɔm <sup>1</sup>	nam <sup>1</sup>	nɛm <sup>1'</sup>	num <sup>1</sup>	ŋum <sup>1</sup>	zum <sup>1</sup>
elephant	象	siaŋ <sup>BC2</sup>	siaŋ <sup>4</sup>	siaŋ <sup>4</sup>	siaŋ <sup>4</sup>	--	siaŋ <sup>4</sup>	siaŋ <sup>4</sup>
flea	跳蚤	mat <sup>D1</sup>	mat <sup>7</sup>	maj <sup>4</sup> mat <sup>7'</sup>	maj <sup>4</sup> mat <sup>7'</sup>	mat <sup>7</sup>	mat <sup>7</sup>	mat <sup>7</sup>
fish	魚	ba: <sup>A1</sup>	ba <sup>1</sup>	ba <sup>1</sup>	ba <sup>1</sup>	ba <sup>1</sup>	ba <sup>1</sup>	ba <sup>1</sup>
fish scales	魚鱗	liʔ <sup>D1</sup>	luʔ <sup>7</sup> ba <sup>1</sup>	liʔ <sup>7'</sup> ba <sup>1</sup>	liʔ <sup>7'</sup> ba <sup>1</sup>	liʔ <sup>8</sup> -t ba <sup>1</sup>	liʔ <sup>7</sup>	liʔ <sup>7</sup> ba <sup>1</sup>
fly	蒼蠅	va:ŋ <sup>BC2</sup>	miŋ <sup>2</sup> -i maŋ <sup>4</sup>	miŋ <sup>2</sup> vaŋ <sup>4</sup>	mɛŋ <sup>2</sup> vaŋ <sup>4</sup>	miŋ <sup>2</sup> vaŋ <sup>4</sup>	miŋ <sup>2</sup> vaŋ <sup>4</sup>	miŋ <sup>2</sup> vaŋ <sup>4</sup>
fur; feather	毛	vun <sup>A2</sup>	bən <sup>2</sup>	vɔn <sup>2</sup>	vɔn <sup>2</sup>	vun <sup>2</sup>	vun <sup>2</sup>	vun <sup>2</sup>
goose	鵞	p <sup>h</sup> u:n <sup>BC2</sup> ; bu:n <sup>BC2</sup>	bən <sup>4</sup> ; bun <sup>4</sup>	p <sup>h</sup> un <sup>4</sup>	p <sup>h</sup> un <sup>4</sup> ; bun <sup>4</sup>	fun <sup>4</sup>	fun <sup>4</sup>	p <sup>h</sup> un <sup>4</sup>



English	Chinese	Proto-Ong-Be	Changliu (長流)	Yongxing (永興)	Longtang (龍塘)	Qiaotou (橋頭)	Huangtong (皇桐)	Xinying (新盈)
head louse	頭蝨	kat <sup>D1</sup>	kat <sup>7</sup>	kat <sup>7'</sup>	kat <sup>7'</sup>	kat <sup>7</sup>	kat <sup>7</sup>	kat <sup>7</sup>
horn	角	vaw <sup>BC2</sup>	baw <sup>2</sup>	vaw <sup>2</sup>	vaw <sup>2</sup>	vaw <sup>2</sup>	vaw <sup>2</sup>	vaw <sup>2</sup>
horse	馬	maʔ <sup>D2</sup>	maʔ <sup>8</sup>	maʔ <sup>8</sup>	maʔ <sup>8'</sup>	maʔ <sup>8</sup>	maʔ <sup>8</sup>	maʔ <sup>8</sup>
land leech	螞蝗	da:k <sup>D1</sup>	maj <sup>4</sup> dak <sup>7</sup>	maj <sup>4</sup> dak <sup>7</sup>	maj <sup>4</sup> dak <sup>7</sup>	dak <sup>7</sup>	dak <sup>7</sup>	dak <sup>7</sup>
maggot	蛆	tən <sup>BC1</sup>	min <sup>2</sup> ten <sup>3</sup>	maj <sup>4</sup> tən <sup>3</sup>	maj <sup>4</sup> tən <sup>3</sup>	ton <sup>3</sup>	tən <sup>3</sup>	tən <sup>3</sup>
mosquito	蚊子	ŋu:ŋ <sup>A2</sup>	min <sup>2</sup> non <sup>2</sup>	maj <sup>4</sup> nuŋ <sup>2</sup>	maj <sup>4</sup> non <sup>2</sup>	nuŋ <sup>2</sup>	ŋuŋ <sup>2</sup>	zuŋ <sup>2</sup>
nest	窩、巢	zu:k <sup>D2</sup>	zuk <sup>8</sup>	zuk <sup>8</sup>	zok <sup>8</sup>	zuk <sup>8</sup>	luk <sup>8</sup>	luk <sup>8</sup>
pangolin	穿山甲	hin <sup>BC2</sup>	han <sup>4</sup>	hən <sup>4</sup>	hən <sup>4</sup>	hən <sup>4</sup>	hin <sup>4</sup>	hin <sup>4</sup>
pig	豬	mu: <sup>A1</sup>	mow <sup>1</sup>	mu <sup>1</sup>	mu <sup>1</sup>	mow <sup>1</sup>	mo <sup>1</sup>	mo <sup>1</sup>
rabbit	兔子	zə:n <sup>BC1</sup>	zun <sup>3</sup>	zin <sup>3</sup>	zin <sup>3</sup>	zən <sup>3</sup>	lən <sup>3</sup>	lən <sup>3</sup>
sheep	羊	tuəŋ <sup>A2</sup>	--	tuəŋ <sup>2</sup>	tuəŋ <sup>2</sup>	tuəŋ <sup>2</sup>	tuəŋ <sup>2</sup>	tuəŋ <sup>2</sup>
shellfish	蛤蜊、田螺	hi: <sup>A1</sup>	hoj <sup>1</sup>	hoj <sup>1</sup>	hej <sup>1'</sup>	hoj <sup>1</sup>	hoj <sup>1</sup>	hoj <sup>1</sup>
shrimp	蝦	zuaŋ <sup>A2</sup>	zuaŋ <sup>2</sup>	--	zuaŋ <sup>2</sup>	zuaŋ <sup>2</sup>	luaŋ <sup>2</sup>	luaŋ <sup>2</sup>
silkworm	蠶	nianŋ <sup>A2</sup>	min <sup>2</sup> nian <sup>2</sup>	nian <sup>2</sup>	nian <sup>2</sup>	--	--	--
small frog	小青蛙	tsian <sup>A1</sup>	lək <sup>8</sup> tsian <sup>1</sup>	maj <sup>4</sup> tsian <sup>1</sup>	tsen <sup>1'</sup>	tsian <sup>1</sup>	lək <sup>8</sup> tsian <sup>1</sup>	tsian <sup>1</sup>
snake	蛇	ŋia <sup>A2</sup>	ŋia <sup>2</sup>	ŋia <sup>2</sup>	ŋia <sup>2</sup>	ŋia <sup>2</sup>	ŋia <sup>2</sup>	ŋia <sup>2</sup>
tadpole	蝌蚪	du:ŋ <sup>A1</sup>	ba <sup>1</sup> duŋ <sup>1</sup>	tshien <sup>1</sup> duŋ <sup>1</sup>	ba <sup>1</sup> tsin <sup>1</sup> doŋ <sup>1'</sup>	ku <sup>2</sup> duŋ <sup>1</sup>	ku <sup>2</sup> duŋ <sup>1</sup>	--
tail	尾巴	tu:ʔ <sup>D1</sup>	tuʔ <sup>7</sup>	tuʔ <sup>7'</sup>	tuʔ <sup>7'</sup>	tuʔ <sup>8</sup> -t	tuʔ <sup>7</sup>	tuʔ <sup>7</sup>
tiger	老虎	zua <sup>A1</sup>	zua <sup>1</sup>	zua <sup>1</sup>	zua <sup>1</sup>	--	zua <sup>1</sup> 'lion' (LC)	--
toad	癩蛤蟆	k'hək <sup>D1</sup>	nuak <sup>8</sup> k'hok <sup>7</sup>	nok <sup>8</sup> k'hok <sup>7'</sup>	nok <sup>8</sup> k'hok <sup>7'</sup>	--	nok <sup>8</sup> xok <sup>7</sup>	--
turtle	龜	du: <sup>BC1</sup>	--	--	ɸow <sup>3</sup>	ɸow <sup>3</sup>	ɸow <sup>3</sup>	ɸow <sup>3</sup>
wasp	黃蜂	ɸaw <sup>BC2</sup>	min <sup>2</sup> ɸaw <sup>4</sup>	ɸaw <sup>4</sup> lan <sup>1</sup>	ɸaw <sup>4</sup>	ɸaw <sup>4</sup>	ɸaw <sup>4</sup>	ɸaw <sup>4</sup>
water buffalo	水牛	tə:j <sup>BC1</sup>	təj <sup>3</sup>	təj <sup>3</sup>	təj <sup>3</sup>	təj <sup>3</sup>	təj <sup>3</sup>	təj <sup>3</sup>
yellow buffalo	黃牛	ŋə:w <sup>A2</sup>	ŋow <sup>2</sup>	ŋəw <sup>2</sup>	ŋəw <sup>2</sup>	ŋəw <sup>2</sup>	ŋu <sup>2</sup>	ŋu <sup>2</sup>
<b>3. Body Parts</b>								
back	後背	ləj <sup>A2</sup>	ɸa <sup>3</sup> le <sup>2</sup>	bək <sup>7'</sup> loj <sup>2</sup>	bək <sup>7'</sup> loj <sup>2</sup>	ɸa <sup>3</sup> loj <sup>2</sup>	ɸa <sup>3</sup> loj <sup>2</sup>	ɸaw <sup>3</sup> loj <sup>2</sup>
beard	鬍子	mu:m <sup>BC2</sup>	mun <sup>4</sup>	ŋum <sup>4</sup>	mon <sup>4</sup>	mum <sup>4</sup>	mum <sup>4</sup>	mum <sup>4</sup>

English	Chinese	Proto-Ong-Be	Changliu (長流)	Yongxing (永興)	Longtang (龍塘)	Qiaotou (橋頭)	Huangtong (皇桐)	Xinying (新盈)
blood	血	baʔ <sup>D1</sup>	baʔ <sup>7</sup>	baʔ <sup>7'</sup>	baʔ <sup>7'</sup>	baʔ <sup>8</sup>	baʔ <sup>7</sup>	baʔ <sup>7</sup>
bone	骨頭	zi:k <sup>D1</sup>	zək <sup>7</sup>	zik <sup>7'</sup>	zik <sup>7'</sup>	--	--	--
buttock	屁股	mə: <sup>BC2</sup>	mək <sup>8</sup> me <sup>4</sup>	bak <sup>7'</sup> mo <sup>4</sup>	bək <sup>7'</sup> mo <sup>4</sup>	bak <sup>7</sup> mo <sup>4</sup>	bak <sup>7</sup> mo <sup>4</sup>	bak <sup>7</sup> mo <sup>4</sup>
chest	胸膛	ʔuk <sup>D1</sup>	bak <sup>7</sup> ʔuak <sup>7</sup>	bak <sup>7'</sup> ʔək <sup>7</sup>	bək <sup>7'</sup> ʔək <sup>7</sup>	bak <sup>7</sup> ʔək <sup>7</sup>	ʔək <sup>7</sup>	bak <sup>7</sup> ʔək <sup>7</sup>
ear	耳朵	sa: <sup>A1</sup>	sa <sup>1</sup>	sa <sup>1</sup>	sa <sup>1</sup>	sa <sup>1</sup>	sa <sup>1</sup>	sa <sup>1</sup>
excrement	屎	ka:j <sup>BC2</sup>	kaj <sup>4</sup>	kaj <sup>4</sup>	kaj <sup>4</sup>	kaj <sup>4</sup>	kaj <sup>4</sup>	kaj <sup>4</sup>
eye	眼睛	da: <sup>A1</sup>	da <sup>1</sup>	da <sup>1</sup>	da <sup>1</sup>	da <sup>1</sup>	da <sup>1</sup>	da <sup>1</sup>
face	臉	na: <sup>BC1</sup>	na <sup>3</sup>	na <sup>3</sup>	na <sup>3</sup>	na <sup>3</sup>	na <sup>3</sup>	na <sup>3</sup>
fart	屁	ɗut <sup>D1</sup>	ɗut <sup>7</sup>	ɗot <sup>7'</sup>	ɗot <sup>7'</sup>	ɗut <sup>7</sup>	ɗut <sup>7</sup>	ɗut <sup>7</sup>
feet; leg	腳	ku:k <sup>D1</sup>	kok <sup>7</sup>	kok <sup>7'</sup>	kok <sup>7'</sup>	kuk <sup>7</sup>	kok <sup>7</sup>	kok <sup>7</sup>
gallbladder	膽	zi: <sup>A1</sup>	zɔj <sup>1</sup>	zɔj <sup>1</sup>	zɛj <sup>1'</sup>	zɔj <sup>1</sup>	zɔj <sup>1</sup>	lɔj <sup>1</sup>
hand	手	mə: <sup>A2</sup>	me <sup>2</sup>	mɔ <sup>2</sup>	mɔ <sup>2</sup>	mɔ <sup>2</sup>	mɔ <sup>2</sup>	mɔ <sup>2</sup>
head	頭	ha:w <sup>BC1</sup>	haw <sup>3</sup>	haw <sup>3</sup>	haw <sup>3</sup>	haw <sup>3</sup>	haw <sup>3</sup>	haw <sup>3</sup>
head hair	頭髮	su: <sup>BC1</sup>	ban <sup>2</sup> so <sup>3</sup>	vən <sup>2</sup> sɔw <sup>3</sup>	mek <sup>8</sup> sew <sup>3</sup>	--	sɔw <sup>3</sup> 'a pile of women's loose hair' (LC)	--
heart	心	tim <sup>A1</sup>	tɔm <sup>1</sup>	mak <sup>8</sup> tɔm <sup>1</sup>	mek <sup>8</sup> tɛm <sup>1'</sup>	mak <sup>8</sup> tɛm <sup>1</sup>	mak <sup>8</sup> tim <sup>1</sup>	tim <sup>1</sup>
intestine	腸	tse: <sup>BC2</sup>	--	--	hoŋ <sup>4</sup> tse <sup>4</sup>	--	tse <sup>4</sup>	tse <sup>4</sup>
knee	膝蓋	həw <sup>A2</sup>	ɗa <sup>1</sup> kok <sup>7</sup> hew <sup>2</sup>	ɗa <sup>1</sup> hoŋ <sup>2</sup>	ɗa <sup>1'</sup> hoŋ <sup>2</sup>	--	--	--
lung	肺	vuŋ <sup>A2</sup>	bɔŋ <sup>2</sup>	voŋ <sup>2</sup>	voŋ <sup>2</sup>	vuŋ <sup>2</sup>	voŋ <sup>2</sup>	voŋ <sup>2</sup>
mouth	嘴	ba:k <sup>D1</sup>	bak <sup>7</sup>	bak <sup>7</sup>	bak <sup>7</sup>	bak <sup>7</sup>	bak <sup>7</sup>	bak <sup>7</sup>
mucus	鼻涕	mu:k <sup>D2</sup>	muk <sup>8</sup>	ŋuk <sup>8</sup>	mok <sup>8</sup>	muk <sup>8</sup>	muk <sup>8</sup>	muk <sup>8</sup>
nail	指甲	zi:p <sup>D2</sup>	ziap <sup>8</sup> -v	zip <sup>8</sup>	zep <sup>8</sup>	zip <sup>8</sup>	lip <sup>8</sup>	lip <sup>8</sup>
navel	肚臍	ɗə: <sup>A2</sup>	p <sup>h</sup> u <sup>4</sup> le <sup>2</sup>	p <sup>h</sup> u <sup>4</sup> ɗɔ <sup>2</sup>	p <sup>h</sup> u <sup>4</sup> lɔ <sup>2</sup> ; p <sup>h</sup> u <sup>4</sup> zɔ <sup>2</sup>	ba <sup>1</sup> ɗɔ <sup>2</sup>	boʔ <sup>8</sup> ɗɔ <sup>2</sup>	ma <sup>2</sup> ɗɔ <sup>2</sup>
neck	脖子	liŋ <sup>BC2</sup>	mək <sup>8</sup> liŋ <sup>4</sup>	mak <sup>8</sup> liŋ <sup>4</sup>	lɛŋ <sup>4</sup>	liŋ <sup>4</sup>	liŋ <sup>4</sup>	liŋ <sup>4</sup>
nose	鼻	zəŋ <sup>A1</sup>	zoŋ <sup>1</sup>	zɔŋ <sup>1</sup>	zɔŋ <sup>1'</sup>	zɔŋ <sup>1</sup>	soŋ <sup>3</sup> lɔŋ <sup>1</sup>	lɔŋ <sup>1</sup>
saliva	口水	nam <sup>BC2</sup> ma:j <sup>A2</sup> ; nam <sup>BC2</sup> mə:j <sup>A2</sup>	nam <sup>4</sup> maj <sup>2</sup>	nam <sup>4</sup> maj <sup>2</sup>	nam <sup>4</sup> maj <sup>2</sup>	nam <sup>4</sup> məj <sup>2</sup>	nam <sup>4</sup> məj <sup>2</sup>	nam <sup>4</sup> məj <sup>2</sup>
shoulder	肩膀	via <sup>BC1</sup>	bak <sup>7</sup> bia <sup>3</sup>	bak <sup>7'</sup> bia <sup>3</sup>	bək <sup>7'</sup> bia <sup>3</sup>	bak <sup>7</sup> via <sup>3</sup>	bak <sup>7</sup> via <sup>3</sup>	bik <sup>7</sup> via <sup>3</sup>

English	Chinese	Proto-Ong-Be	Changliu (長流)	Yongxing (永興)	Longtang (龍塘)	Qiaotou (橋頭)	Huangtong (皇桐)	Xinying (新盈)
								'arm'
skin	皮膚	naŋ <sup>A1</sup>	naŋ <sup>1</sup>	naŋ <sup>1</sup>	neŋ <sup>1'</sup>	naŋ <sup>1</sup>	naŋ <sup>1</sup>	naŋ <sup>1</sup>
sweat	汗水	hən <sup>BC2</sup>	hen <sup>4</sup>	hɔn <sup>4</sup>	hɔn <sup>4</sup>	hon <sup>4</sup>	hɔn <sup>4</sup>	hɔn <sup>4</sup>
thigh	大腿	va: <sup>A2</sup>	mɔk <sup>8</sup> ba <sup>2</sup>	mak <sup>8</sup> va <sup>2</sup>	mek <sup>8</sup> va <sup>2</sup>	mak <sup>8</sup> va <sup>2</sup>	maj <sup>4</sup> va <sup>2</sup>	maŋ <sup>4</sup> va <sup>2</sup>
throat	喉嚨	kə: <sup>A2</sup>	ɗɔn <sup>4</sup> ke <sup>2</sup>	ɗɔn <sup>4</sup> ko <sup>2</sup>	ɗan <sup>4</sup> ko <sup>2</sup>	ko <sup>2</sup> ; ɗun <sup>4</sup> ko <sup>2</sup>	ɗun <sup>4</sup> ko <sup>2</sup>	ɗun <sup>4</sup> ko <sup>2</sup>
tongue	舌頭	li:n <sup>BC2</sup>	lin <sup>4</sup>	lin <sup>4</sup>	lin <sup>4</sup>	lin <sup>4</sup>	lin <sup>4</sup>	lin <sup>4</sup>
tooth	牙齒	tin <sup>A1</sup>	tɔn <sup>1</sup>	tɔn <sup>1</sup>	ten <sup>1'</sup>	tən <sup>1</sup>	tin <sup>1</sup>	tin <sup>1</sup>
urine	尿	zu: <sup>A1</sup>	zow <sup>1</sup>	zow <sup>1</sup>	zəw <sup>1'</sup>	zow <sup>1</sup>	zow <sup>1</sup>	low <sup>1</sup>
waist	腰	lu: <sup>BC1</sup>	lo <sup>3</sup>	low <sup>3</sup>	low <sup>3</sup>	low <sup>3</sup>	low <sup>3</sup>	low <sup>3</sup>
<b>4. Nature</b>								
ash	灰燼	dəw <sup>BC2</sup>	dew <sup>4</sup>	ɗow <sup>4</sup>	ɗow <sup>4</sup>	ɗow <sup>4</sup>	ɗow <sup>4</sup>	ɗow <sup>4</sup>
cloud	雲	ba: <sup>BC2</sup>	ba <sup>4</sup>	ba <sup>4</sup>	ba <sup>4</sup>	ba <sup>4</sup>	ba <sup>4</sup>	ba <sup>4</sup>
dry field; hillside	旱田、 山坡地	və:n <sup>BC1</sup>	--	--	bin <sup>3</sup>	vən <sup>3</sup>	vən <sup>3</sup>	vən <sup>3</sup>
fire	火	və:j <sup>A2</sup>	bɛ(j) <sup>2</sup>	vɛj <sup>2</sup>	vɛj <sup>2</sup>	vəj <sup>2</sup>	vəj <sup>2</sup>	vəj <sup>2</sup>
firewood	柴	və:n <sup>A2</sup>	bən <sup>2</sup>	vən <sup>2</sup>	vən <sup>2</sup>	vən <sup>2</sup>	vən <sup>2</sup>	vən <sup>2</sup>
fog; dew	霧、露水	ŋiaw <sup>BC2</sup>	--	ŋiaw <sup>4</sup>	ŋiaw <sup>4</sup>	ŋiaw <sup>4</sup>	ŋiaw <sup>4</sup>	ŋiaw <sup>4</sup>
grease	動物脂肪	ma:n <sup>A2</sup>	man <sup>2</sup>	man <sup>2</sup>	man <sup>2</sup>	man <sup>2</sup>	man <sup>2</sup>	man <sup>2</sup>
land	(土)地	mat <sup>D2</sup>	mat <sup>8</sup>	mat <sup>8</sup>	met <sup>8'</sup>	mat <sup>8</sup>	mat <sup>8</sup>	mat <sup>8</sup>
lime	石灰	ho:j	hoj <sup>1</sup>	hoj <sup>1</sup>	hoj <sup>1</sup>	hoj <sup>1</sup>	hoj <sup>1</sup>	hoj <sup>1</sup>
moon	月亮	saj <sup>A1</sup>	soj <sup>1</sup>	saj <sup>1</sup>	maj <sup>4</sup> sej <sup>1'</sup>	saj <sup>1</sup>	maj <sup>4</sup> saj <sup>1</sup>	maj <sup>4</sup> saj <sup>1</sup>
mountain; wild	山、野外	saŋ <sup>A1</sup>	saŋ <sup>1</sup>	saŋ <sup>1</sup>	səŋ <sup>1'</sup>	saŋ <sup>1</sup>	saŋ <sup>1</sup> 'wild'	saŋ <sup>1</sup> 'wild'
mud	泥(土)	bun <sup>A2</sup>	bɔŋ <sup>2</sup>	bɔŋ <sup>2</sup> 'dust'	bɔŋ <sup>2</sup>	bun <sup>2</sup>	bɔŋ <sup>2</sup>	bɔŋ <sup>2</sup>
paddy field	水田	nia <sup>A2</sup>	nia <sup>2</sup>	nia <sup>2</sup>	nia <sup>2</sup>	nia <sup>2</sup>	nia <sup>2</sup>	nia <sup>2</sup>
rain	雨	p <sup>h</sup> un <sup>A1</sup>	p <sup>h</sup> an <sup>1</sup>	p <sup>h</sup> ɔn <sup>1</sup>	p <sup>h</sup> en <sup>1'</sup>	fun <sup>1</sup>	fun <sup>1</sup>	p <sup>h</sup> un <sup>1</sup>
sand	沙	ta:ŋ <sup>A1</sup>	taŋ <sup>1</sup>	taŋ <sup>1</sup>	taŋ <sup>1</sup>	taŋ <sup>1</sup>	taŋ <sup>1</sup>	taŋ <sup>1</sup>
shadow	影子	ŋu:j <sup>A1</sup>	muj <sup>1</sup>	muj <sup>1</sup>	muj <sup>1'</sup>	ŋuj <sup>1</sup>	ŋuj <sup>1</sup>	ŋuj <sup>1</sup>
sky	天	p <sup>h</sup> a: <sup>BC1</sup>	ɗa <sup>3</sup> p <sup>h</sup> a <sup>3</sup>	p <sup>h</sup> a <sup>3</sup>	p <sup>h</sup> a <sup>3</sup>	fa <sup>3</sup>	fa <sup>3</sup>	p <sup>h</sup> a <sup>3</sup>

English	Chinese	Proto-Ong-Be	Changliu (長流)	Yongxing (永興)	Longtang (龍塘)	Qiaotou (橋頭)	Huangtong (皇桐)	Xinying (新盈)
sound; noise	聲音	saw <sup>A1</sup>	saw <sup>1</sup>	saw <sup>1</sup>	səw <sup>1'</sup>	saw <sup>1</sup>	saw <sup>1</sup>	saw <sup>1</sup>
star	星星	hit <sup>D1</sup>	mak <sup>8</sup> hat <sup>7</sup>	mak <sup>8</sup> hat <sup>7'</sup>	mek <sup>8</sup> k <sup>h</sup> ot <sup>7'</sup>	mak <sup>8</sup> hət <sup>7</sup> 'eggplant'	ma <sup>2</sup> hit <sup>7</sup> 'hail'	ma <sup>2</sup> hit <sup>7</sup> 'hail'
stone	石頭	dī:n <sup>A2</sup>	dīn <sup>2</sup>	dīn <sup>2</sup>	dīn <sup>2</sup>	dīn <sup>2</sup>	dīn <sup>2</sup>	dīn <sup>2</sup>
sun	太陽	da <sup>A1</sup> vin <sup>A2</sup>	da <sup>1</sup> ban <sup>2</sup>	da <sup>1</sup> vɔn <sup>2</sup>	da <sup>1</sup> vɔn <sup>2</sup>	da <sup>1</sup> vən <sup>2</sup>	da <sup>3</sup> -t vən <sup>2</sup>	da <sup>1</sup> vən <sup>2</sup>
water	水	nam <sup>BC2</sup>	nam <sup>4</sup>	nam <sup>4</sup>	nam <sup>4</sup>	nam <sup>4</sup>	nam <sup>4</sup>	nam <sup>4</sup>
wind	風	van <sup>BC1</sup>	ban <sup>3</sup>	van <sup>3</sup>	van <sup>3</sup>	van <sup>3</sup>	van <sup>3</sup>	van <sup>3</sup>
wings	翅膀	bi:k <sup>D1</sup>	bik <sup>7</sup>	bik <sup>7'</sup>	bik <sup>7'</sup>	bik <sup>7</sup>	bik <sup>7</sup>	bik <sup>7</sup>
<b>5. Adjectives &amp; Verbs</b>								
alive	活	zu: <sup>BC1</sup>	zow <sup>3</sup>	zow <sup>3</sup>	zow <sup>3</sup>	zow <sup>3</sup>	zow <sup>3</sup>	zəw <sup>3</sup>
bad (not good)	壞	tsəm <sup>BC2</sup>	tsim <sup>4</sup>	tsom <sup>4</sup>	tsom <sup>4</sup>	--	--	--
big	大	ŋə: <sup>BC1</sup>	ne <sup>3</sup>	no <sup>3</sup>	--	no <sup>3</sup>	ŋo <sup>3</sup>	zo <sup>3</sup>
bitter	苦	kam <sup>A2</sup>	kam <sup>2</sup>	kam <sup>2</sup>	kam <sup>2</sup>	kam <sup>2</sup>	kam <sup>2</sup>	kam <sup>2</sup>
black	黑	zam <sup>A1</sup>	zam <sup>1</sup>	zam <sup>1</sup>	zəm <sup>1'</sup>	zam <sup>1</sup>	zam <sup>1</sup>	lam <sup>1</sup>
blind	瞎	lak <sup>D1</sup>	lak <sup>7</sup>	--	lak <sup>7'</sup>	lak <sup>7</sup>	lak <sup>7</sup>	lak <sup>7</sup>
blue	藍	la:m <sup>A2</sup>	lam <sup>2</sup>	lam <sup>2</sup>	lam <sup>2</sup>	lam <sup>2</sup>	lam <sup>2</sup>	lam <sup>2</sup>
bright	亮	ba:ŋ <sup>A1</sup>	baŋ <sup>1</sup>	baŋ <sup>1</sup>	baŋ <sup>1</sup>	baŋ <sup>1</sup>	baŋ <sup>1</sup>	baŋ <sup>1</sup>
clean	乾淨	baŋ <sup>BC1</sup>	baŋ <sup>3</sup>	baŋ <sup>3</sup>	--	baŋ <sup>3</sup>	baŋ <sup>3</sup>	baŋ <sup>3</sup>
clear	清澈	hə: <sup>A1</sup>	he <sup>1</sup>	ho <sup>1</sup>	ho <sup>1</sup>	ho <sup>1</sup>	ho <sup>1</sup>	--
cold	冷	ni:t <sup>D1</sup>	nit <sup>7</sup>	nit <sup>7</sup>	nit <sup>7</sup>	nit <sup>7</sup>	nit <sup>7</sup>	nit <sup>7</sup>
dead	死	da:j <sup>A1</sup>	daj <sup>1</sup>	daj <sup>1</sup>	daj <sup>1</sup>	daj <sup>1</sup>	daj <sup>1</sup>	daj <sup>1</sup>
deaf	聾	mak <sup>D2</sup>	mak <sup>8</sup>	mak <sup>8</sup>	mek <sup>8'</sup>	mak <sup>8</sup>	mak <sup>8</sup>	mak <sup>8</sup>
delicious	好吃	ʔe:n <sup>BC1</sup>	ʔen <sup>3</sup>	ʔien <sup>3</sup>	ʔen <sup>3</sup>	ʔen <sup>3</sup>	ʔen <sup>3</sup>	ʔen <sup>3</sup>
drunk	醉	mə:j <sup>A2</sup>	mej <sup>2</sup>	mej <sup>2</sup>	mej <sup>2</sup>	məj <sup>2</sup>	məj <sup>2</sup>	məj <sup>2</sup>
dry	乾	ziaŋ <sup>BC1</sup>	ziaŋ <sup>3</sup>	ziaŋ <sup>3</sup>	ziaŋ <sup>3</sup>	ziaŋ <sup>3</sup>	liaŋ <sup>3</sup>	liaŋ <sup>3</sup>
empty	空	zə:j <sup>A1</sup>	zuŋ <sup>1</sup>	zi <sup>1</sup>	zi <sup>1</sup>	zəj <sup>1</sup>	ləj <sup>1</sup>	ləj <sup>1</sup>
expensive	貴	k <sup>h</sup> ək <sup>D2</sup>	k <sup>h</sup> ok <sup>8</sup>	k <sup>h</sup> ok <sup>8</sup>	k <sup>h</sup> ok <sup>8'</sup>	xok <sup>8</sup>	xok <sup>8</sup>	k <sup>h</sup> ok <sup>8</sup>
far	遠	li: <sup>A1</sup>	loj <sup>1</sup>	loj <sup>1</sup>	ləj <sup>1'</sup>	loj <sup>1</sup>	loj <sup>1</sup>	loj <sup>1</sup>

English	Chinese	Proto-Ong-Be	Changliu (長流)	Yongxing (永興)	Longtang (龍塘)	Qiaotou (橋頭)	Huangtong (皇桐)	Xinying (新盈)
fast; quick	快	k <sup>h</sup> uaj <sup>BC1</sup> ; me:ŋ <sup>BC1</sup>	k <sup>h</sup> uaj <sup>3</sup>	k <sup>h</sup> uaj <sup>3</sup>	k <sup>h</sup> uaj <sup>3</sup>	mɛŋ <sup>3</sup>	mɛŋ <sup>3</sup>	mɛŋ <sup>3</sup>
fat; plump	肥胖	p <sup>h</sup> u:j <sup>A2</sup>	p <sup>h</sup> oj <sup>2</sup>	--	p <sup>h</sup> uj <sup>2</sup>	p <sup>h</sup> uj <sup>2</sup>	fuj <sup>2</sup>	p <sup>h</sup> uj <sup>2</sup>
few; little	少	ti:w <sup>BC1</sup>	tiw <sup>3</sup>	tiw <sup>3</sup>	tiw <sup>3</sup>	tiw <sup>3</sup>	tiw <sup>3</sup>	tiw <sup>3</sup>
firm; hard	硬	zuaʔ <sup>D1</sup>	zuaʔ <sup>7</sup>	zuaʔ <sup>7'</sup>	zuaʔ <sup>7'</sup>	zuaʔ <sup>7</sup>	luaʔ <sup>7</sup>	luaʔ <sup>7</sup>
flat; smooth	平	p <sup>h</sup> iŋ <sup>A2</sup>	p <sup>h</sup> iŋ <sup>2</sup>	p <sup>h</sup> iŋ <sup>2</sup>	p <sup>h</sup> ɛŋ <sup>2</sup>	fiŋ <sup>2</sup>	fiŋ <sup>2</sup>	p <sup>h</sup> iŋ <sup>2</sup>
fragrant	香	hianj <sup>A1</sup>	hianj <sup>1</sup>	hianj <sup>1</sup>	hianj <sup>1</sup>	hianj <sup>1</sup>	hianj <sup>1</sup>	hianj <sup>1</sup>
full (after eating)	飽	kə:m <sup>A2</sup>	kom <sup>2</sup>	kum <sup>2</sup>	kum <sup>2</sup>	kəm <sup>2</sup>	kəm <sup>2</sup>	kəm <sup>2</sup>
full; filled	滿	dī:k <sup>D1</sup>	dik <sup>7</sup>	dik <sup>7'</sup>	dīt <sup>7'</sup>	dik <sup>7</sup>	dik <sup>7</sup>	dik <sup>7</sup>
green	綠	he:w <sup>A1</sup>	hew <sup>1</sup>	hew <sup>1</sup>	hew <sup>1</sup>	--	--	--
heavy	重	k <sup>h</sup> ən <sup>A1</sup>	k <sup>h</sup> en <sup>1</sup>	k <sup>h</sup> ɔn <sup>1</sup>	k <sup>h</sup> ɔn <sup>1</sup>	xon <sup>1</sup>	xɔn <sup>1</sup>	k <sup>h</sup> ɔn <sup>1</sup>
hot; to heat	熱	lu:n <sup>BC1</sup>	lun <sup>3</sup>	lun <sup>3</sup>	lun <sup>3</sup>	lun <sup>3</sup>	lun <sup>3</sup>	lun <sup>3</sup>
hungry	餓	zak <sup>D1</sup> ; zia <sup>D1</sup>	zak <sup>7</sup>	zak <sup>7'</sup>	zak <sup>7'</sup>	ziak <sup>7</sup>	ziak <sup>7</sup>	ziak <sup>7</sup>
itchy	癢	kum <sup>A2</sup>	kɔm <sup>2</sup>	kɔm <sup>2</sup>	kɔm <sup>2</sup>	kum <sup>2</sup>	kum <sup>2</sup>	kum <sup>2</sup>
light (not heavy)	輕	k <sup>h</sup> ə: <sup>BC1</sup>	k <sup>h</sup> e <sup>3</sup>	k <sup>h</sup> ɔ <sup>3</sup>	k <sup>h</sup> ɔ <sup>3</sup>	xo <sup>3</sup>	xɔ <sup>3</sup>	k <sup>h</sup> ɔ <sup>3</sup>
low	矮、低	dəm <sup>BC1</sup>	dɔm <sup>3</sup>	dɔm <sup>3</sup>	dɔm <sup>3</sup>	dɔm <sup>3</sup>	dɔm <sup>3</sup>	dɔm <sup>3</sup>
male	雄性	ha:w <sup>BC2</sup>	--	haw <sup>4</sup>	haw <sup>4</sup>	--	haw <sup>4</sup>	haw <sup>4</sup>
many	多	liaw <sup>BC2</sup>	liaw <sup>4</sup>	liaw <sup>4</sup>	liaw <sup>4</sup>	liaw <sup>4</sup>	liaw <sup>4</sup>	liaw <sup>4</sup>
mute	啞	ŋup <sup>D1</sup>	ŋop <sup>7</sup>	ŋɔp <sup>7'</sup> 'quiet'	ŋɔp <sup>7'</sup> (L&Z)	ŋop <sup>7</sup>	ŋop <sup>7</sup>	ŋop <sup>7</sup>
narrow	窄	tsik <sup>D1</sup>	tsek <sup>7</sup>	tsek <sup>7'</sup>	tsek <sup>7'</sup>	tsek <sup>7</sup>	ʔɛp <sup>8</sup> tsek <sup>7</sup>	tsek <sup>7</sup>
new	新	na:w <sup>BC2</sup>	naw <sup>4</sup>	naw <sup>4</sup>	naw <sup>4</sup>	naw <sup>4</sup>	naw <sup>4</sup>	naw <sup>4</sup>
near	近	lə: <sup>BC1</sup>	le <sup>3</sup>	lɔ <sup>3</sup>	lɔ <sup>3</sup>	lɔ <sup>3</sup>	lɔ <sup>3</sup>	lɔ <sup>3</sup>
old	舊	ka:w <sup>BC1</sup>	kaw <sup>3</sup>	kaw <sup>3</sup>	kaw <sup>3</sup>	kaw <sup>3</sup>	kaw <sup>3</sup>	kaw <sup>3</sup>
old (not young)	老	la:w <sup>BC2</sup>	law <sup>4</sup>	law <sup>4</sup>	law <sup>4</sup>	law <sup>4</sup>	law <sup>4</sup>	law <sup>4</sup>
raw	生	zip <sup>D1</sup>	zɔp <sup>7</sup>	zɔp <sup>7'</sup>	zɔp <sup>7'</sup>	zɛp <sup>7</sup>	zip <sup>7</sup>	lip <sup>7</sup>
red; crimson	紅、赤紅	zi:ŋ <sup>A1</sup>	ziŋ <sup>1</sup>	--	ziŋ <sup>1'</sup> (L&Z)	ziŋ <sup>1</sup>	liŋ <sup>1</sup> (BL)	--
ripe	熟	ŋaw <sup>BC1</sup>	ŋaw <sup>3</sup>	ŋaw <sup>3</sup>	ŋaw <sup>3</sup>	ŋaw <sup>3</sup>	ŋaw <sup>3</sup>	ŋaw <sup>3</sup>

English	Chinese	Proto-Ong-Be	Changliu (長流)	Yongxing (永興)	Longtang (龍塘)	Qiaotou (橋頭)	Huangtong (皇桐)	Xinying (新盈)
rotten	腐爛	də:j <sup>A2</sup>	dɛj <sup>2</sup>	dɛj <sup>2</sup>	dɛj <sup>2</sup>	dɛj <sup>2</sup>	dɛj <sup>2</sup>	dɛj <sup>2</sup>
rotten; broken	壞	p <sup>h</sup> a:j <sup>BC2</sup>	p <sup>h</sup> aj <sup>4</sup>	p <sup>h</sup> aj <sup>4</sup>	p <sup>h</sup> aj <sup>4</sup>	faj <sup>4</sup>	--	p <sup>h</sup> aj <sup>4</sup>
salty	鹹	zan <sup>BC1</sup>	zan <sup>3</sup>	zan <sup>3</sup>	zan <sup>3</sup>	zan <sup>3</sup>	lan <sup>3</sup>	lan <sup>3</sup>
shallow	淺	də:n <sup>BC1</sup>	dun <sup>3</sup>	din <sup>3</sup>	din <sup>3</sup>	dən <sup>3</sup>	dən <sup>3</sup>	dən <sup>3</sup>
short (distance & time)	短 (距離、 時間)	dun <sup>BC1</sup> or din <sup>BC1</sup>	dən <sup>3</sup>	dən <sup>3</sup>	dən <sup>3</sup>	--	--	--
short (distance & time)	短 (距離、 時間)	k <sup>h</sup> ut <sup>D2</sup> or k <sup>h</sup> u:t <sup>D2</sup>	--	--	--	xut <sup>8</sup>	xut <sup>8</sup> -i	k <sup>h</sup> ut <sup>8</sup>
sick	病	p <sup>h</sup> in <sup>BC2</sup>	p <sup>h</sup> in <sup>4</sup>	p <sup>h</sup> in <sup>4</sup>	p <sup>h</sup> ɛŋ <sup>4</sup>	fiŋ <sup>4</sup>	fiŋ <sup>4</sup>	p <sup>h</sup> in <sup>4</sup>
slim; thin	瘦	su:m <sup>A1</sup>	sum <sup>1</sup>	sum <sup>1</sup>	sum <sup>1'</sup>	sum <sup>1</sup>	sum <sup>1</sup>	sum <sup>1</sup>
small	小	ni:ʔ <sup>D1</sup>	niʔ <sup>7</sup>	niʔ <sup>7'</sup>	ni <sup>7'</sup>	niʔ <sup>7</sup>	--	--
smelly	臭	kəʔ <sup>D2</sup>	kɔʔ <sup>8</sup>	koʔ <sup>8</sup>	koʔ <sup>8'</sup>	koʔ <sup>8</sup>	kɔʔ <sup>8</sup>	koʔ <sup>8</sup>
sour	酸	hua <sup>BC1</sup>	hua <sup>3</sup>	hua <sup>3</sup>	hua <sup>3</sup>	hua <sup>3</sup>	(h)ua <sup>3</sup>	hua <sup>3</sup>
spicy	辣	kə:n <sup>A2</sup>	--	kən <sup>2</sup>	kən <sup>2</sup>	kən <sup>2</sup>	kən <sup>2</sup>	kən <sup>2</sup>
sticky	黏	taŋ <sup>A1</sup>	dən <sup>1</sup>	dən <sup>1</sup>	dɛŋ <sup>1'</sup>	dən <sup>1</sup>	dən <sup>1</sup>	--
straight (not crooked)	直	daʔ <sup>D2</sup>	dɑʔ <sup>8</sup>	daʔ <sup>8</sup>	da(ʔ) <sup>8'</sup> ; dɛʔ <sup>8'</sup>	--	--	dɑʔ <sup>8</sup>
sweet; delicious	甜、好吃	liam <sup>A2</sup>	liam <sup>2</sup>	liam <sup>2</sup>	liam <sup>2</sup>	--	--	--
swollen	腫	kət <sup>D2</sup>	kɔt <sup>8</sup>	kɔt <sup>8</sup>	kuat <sup>8'</sup>	kɔt <sup>8</sup>	kɔt <sup>8</sup>	kɔt <sup>8</sup>
thick (not thin)	厚	na: <sup>A1</sup>	na <sup>1</sup>	na <sup>1</sup>	na <sup>1</sup>	na <sup>1</sup>	na <sup>1</sup>	na <sup>1</sup>
thin (not thick)	薄	vian <sup>A1</sup>	bian <sup>1</sup>	bian <sup>1</sup>	bian <sup>1</sup>	vian <sup>1</sup>	vian <sup>1</sup>	vian <sup>1</sup>
tight	緊	kəŋ <sup>A1</sup>	kən <sup>1</sup>	kən <sup>1</sup>	kən <sup>1'</sup>	kən <sup>2</sup>	--	kən <sup>1</sup>
tired	累	nuaj <sup>BC1</sup>	--	nuaj <sup>3</sup>	nuaj <sup>3</sup>	nuaj <sup>3</sup>	nuaj <sup>3</sup>	nuaj <sup>3</sup>
to arrive	到 (達)	dən <sup>A1</sup>	dən <sup>1</sup>	dən <sup>1</sup>	dən <sup>1'</sup>	dən <sup>1</sup>	dən <sup>1</sup>	dən <sup>1</sup>
to ascend	上 (山)	kə:n <sup>BC1</sup>	kun <sup>3</sup>	kin <sup>3</sup>	kin <sup>3</sup>	kən <sup>3</sup>	kən <sup>3</sup>	kən <sup>3</sup>
to ask	問	təj <sup>BC1</sup>	tej <sup>3</sup>	tɔj <sup>3</sup>	tɔj <sup>3</sup>	tɔj <sup>3</sup>	tɔj <sup>3</sup>	tɔj <sup>3</sup>
to bark	(狗) 吠	saw <sup>BC1</sup>	saw <sup>3</sup>	saw <sup>3</sup>	saw <sup>3</sup>	saw <sup>3</sup>	saw <sup>3</sup>	saw <sup>3</sup>
to bend	彎曲	ʔe:w <sup>A1</sup>	ʔew <sup>1</sup>	--	ʔew <sup>1</sup>	ʔɛw <sup>1</sup>	ʔɛw <sup>1</sup>	ʔɛw <sup>1</sup>

English	Chinese	Proto-Ong-Be	Changliu (長流)	Yongxing (永興)	Longtang (龍塘)	Qiaotou (橋頭)	Huangtong (皇桐)	Xinying (新盈)
to blink	眨	liap <sup>D1</sup> ; ŋiap <sup>D1</sup>	--	liap <sup>7'</sup> ɗa <sup>1</sup>	liap <sup>7'</sup> ɗa <sup>1</sup> ; niap <sup>7'</sup> ɗa <sup>1</sup>	niap <sup>7</sup> ɗa <sup>1</sup>	ŋiap <sup>7</sup> ɗa <sup>1</sup>	ziap <sup>7</sup> ɗa <sup>1</sup>
to blow	吹	vəw <sup>BC2</sup>	ɸew <sup>4</sup>	vɔw <sup>4</sup>	vɔw <sup>4</sup>	vɔw <sup>4</sup>	vɔw <sup>4</sup>	vɔw <sup>4</sup>
to borrow	借	na:j <sup>BC1</sup>	naj <sup>3</sup>	naj <sup>3</sup>	naj <sup>3</sup>	naj <sup>3</sup>	naj <sup>3</sup>	naj <sup>3</sup>
to braid	編 (辮子)	la:w <sup>BC1</sup>	law <sup>3</sup>	law <sup>3</sup>	law <sup>3</sup>	law <sup>3</sup>	law <sup>3</sup>	law <sup>3</sup>
to burn	燒 (稻草)	zu:t <sup>D1</sup>	--	zut <sup>7</sup>	zut <sup>7</sup>	zut <sup>7</sup>	zut <sup>8</sup> -t	lut <sup>7</sup>
to carry (by hand)	提	ɗi:w <sup>BC2</sup>	--	ɗiw <sup>4</sup>	--	ɗiw <sup>4</sup>	ɗiw <sup>4</sup>	ɗiw <sup>4</sup>
to carry (on shoulders)	挑 (擔)	ha:p <sup>D1</sup>	hap <sup>7</sup>	hap <sup>7</sup>	hap <sup>7</sup>	hap <sup>7</sup>	hap <sup>7</sup>	hap <sup>7</sup>
to castrate	閹	ɗo:n <sup>A1</sup>	ɗon <sup>1</sup>	ɗon <sup>1</sup>	ɗon <sup>1</sup>	ɗon <sup>1</sup>	ɗon <sup>1</sup>	ɗon <sup>1</sup>
to cook (rice)	煮 (飯)	hu:ŋ <sup>A2</sup>	hoŋ <sup>2</sup>	huŋ <sup>2</sup>	hoŋ <sup>2</sup>	huŋ <sup>2</sup>	huŋ <sup>2</sup>	huŋ <sup>2</sup>
to chop	剁	tsup <sup>D1</sup>	tsɔp <sup>7</sup>	tsɔp <sup>7'</sup>	tsap <sup>7'</sup>	--	--	--
to come	來	nia <sup>A2</sup>	nia <sup>3</sup> -t	nia <sup>2</sup>	nia <sup>2</sup>	nia <sup>2</sup>	--	mia <sup>2</sup>
to cough	咳嗽	ʔaj <sup>A1</sup>	ʔaj <sup>1</sup>	ʔaj <sup>1</sup>	ʔej <sup>1'</sup> haŋ <sup>1</sup>	ʔaj <sup>1</sup> haŋ <sup>1</sup>	ʔaj <sup>1</sup>	ko <sup>2</sup> ʔaj <sup>1</sup>
to count	數 (數)	tuan <sup>BC1</sup>	tuan <sup>3</sup>	tuan <sup>3</sup>	tuan <sup>3</sup>	tuan <sup>3</sup>	tuan <sup>3</sup>	tuan <sup>3</sup>
to cover	蓋	k <sup>h</sup> um <sup>BC1</sup> ; k <sup>h</sup> up <sup>D1</sup>	k <sup>h</sup> ɔm <sup>3</sup>	k <sup>h</sup> ɔm <sup>3</sup> ; k <sup>h</sup> ɔp <sup>7'</sup>	k <sup>h</sup> ɔp <sup>7'</sup>	xɔp <sup>7</sup>	xum <sup>3</sup>	tsum <sup>3</sup> -i
to crawl	爬	lɛ:ʔ <sup>D2</sup>	--	--	--	lɛʔ <sup>8</sup>	lɛʔ <sup>8</sup>	lɛʔ <sup>8</sup>
to crow	雞鳴	ta:n <sup>A1</sup>	tan <sup>1</sup>	tan <sup>1</sup>	tan <sup>1</sup>	tan <sup>1</sup>	tan <sup>1</sup>	tan <sup>1</sup>
to cry	哭	ŋaj <sup>BC1</sup>	ŋaj <sup>3</sup>	ŋaj <sup>3</sup>	ŋaj <sup>3</sup>	ŋaj <sup>3</sup>	ŋaj <sup>3</sup>	ŋaj <sup>3</sup>
to cut	剪	ke:w <sup>A1</sup>	kew <sup>1</sup>	kew <sup>1</sup>	kew <sup>1</sup>	kɛw <sup>1</sup>	kɛw <sup>1</sup>	kɛw <sup>1</sup>
to descend	下 (山)	zuŋ <sup>A2</sup>	zɔŋ <sup>2</sup>	zɔŋ <sup>2</sup>	zɔŋ <sup>2</sup>	zuŋ <sup>2</sup>	zɔŋ <sup>2</sup>	loŋ <sup>2</sup>
to dream; dream	作夢; 夢	vən <sup>A2</sup>	ɸen <sup>2</sup>	vən <sup>2</sup>	vɔn <sup>2</sup>	von <sup>2</sup>	vɔn <sup>2</sup>	vɔn <sup>2</sup>
to eat	吃	kən <sup>A1</sup>	kɔn <sup>1</sup>	kɔn <sup>1</sup>	kɔn <sup>1'</sup>	kɔn <sup>1</sup>	kɔn <sup>1</sup>	kɔn <sup>1</sup>
to fight	打 (架)	ki:t <sup>D1</sup>	kit <sup>7</sup>	kit <sup>7'</sup>	kit <sup>7'</sup>	kit <sup>7</sup>	kit <sup>7</sup>	kit <sup>7</sup>
to float; floating	漂浮	vaw <sup>A1</sup>	ɸaw <sup>1</sup>	vaw <sup>1</sup>	ɸaw <sup>2</sup> -t	vaw <sup>1</sup>	vaw <sup>1</sup>	vaw <sup>1</sup>
to flow	(水) 流	lə:j <sup>A1</sup>	le <sup>1</sup>	li <sup>1</sup>	li <sup>1</sup>	ləj <sup>1</sup>	ləj <sup>1</sup>	ləj <sup>1</sup>
to fly	飛	vin <sup>A1</sup>	ɸan <sup>1</sup>	ɸɔn <sup>1</sup>	ɸen <sup>1'</sup>	vin <sup>1</sup>	vin <sup>1</sup>	vin <sup>1</sup>

English	Chinese	Proto-Ong-Be	Changliu (長流)	Yongxing (永興)	Longtang (龍塘)	Qiaotou (橋頭)	Huangtong (皇桐)	Xinying (新盈)
to give	給	se: A1	--	se <sup>1</sup>	se <sup>1</sup>	sɛ <sup>1</sup>	sɛ <sup>1</sup>	sɛ <sup>1</sup>
to give away	送	huŋ BC1	hɔŋ <sup>3</sup>	hoŋ <sup>3</sup>	hoŋ <sup>3</sup>	huŋ <sup>3</sup>	hoŋ <sup>3</sup>	hoŋ <sup>3</sup>
to gnaw	啃	kaʔ D1	kaʔ <sup>7</sup>	--	--	kaʔ <sup>7</sup>	kaʔ <sup>7</sup>	--
to go; to walk	去、走	bi: A1	bɛj <sup>1</sup>	bɛj <sup>55</sup>	bɛj <sup>1'</sup>	bɔj <sup>1</sup>	bɔj <sup>1</sup>	bɔj <sup>1</sup>
to grab	抓	hə: A2	he <sup>2</sup>	hɔ <sup>2</sup>	hɔ <sup>2</sup>	ho <sup>2</sup>	hɔ <sup>2</sup>	hɔ <sup>2</sup>
to grow (vegetables)	種 (花、 草)	sa: A1	sa <sup>1</sup>	sa <sup>1</sup>	sa <sup>1</sup>	sa <sup>1</sup>	sa <sup>1</sup>	sa <sup>1</sup>
to hold objects in the mouth	含	ham A2	ham <sup>2</sup>	ham <sup>2</sup>	(h)am <sup>2</sup>	ham <sup>2</sup>	hɔm <sup>2</sup>	hɔm <sup>2</sup>
to kill	殺	ka: BC1	ka <sup>3</sup>	ka <sup>3</sup>	ka <sup>3</sup>	ka <sup>3</sup>	ka <sup>3</sup>	ka <sup>3</sup>
to knock	敲 (門)	k <sup>h</sup> aw A1	k <sup>h</sup> aw <sup>1</sup>	k <sup>h</sup> aw <sup>1</sup>	k <sup>h</sup> ew <sup>1'</sup>	k <sup>h</sup> aw <sup>1</sup>	xaw <sup>1</sup>	k <sup>h</sup> aw <sup>1</sup>
to lick	舔	li:m BC2	--	lim <sup>4</sup>	zim <sup>4</sup>	lim <sup>4</sup>	lim <sup>4</sup>	lim <sup>4</sup>
to lie down	躺	lap D1	lap <sup>7</sup>	lap <sup>7'</sup>	lap <sup>7'</sup>	lap <sup>7</sup>	lap <sup>7</sup>	lap <sup>7</sup>
to lift	抬	ha:m A1	ham <sup>1</sup>	ham <sup>1</sup>	ham <sup>1</sup>	ham <sup>1</sup>	ham <sup>1</sup>	ham <sup>1</sup>
to make things dirty	弄髒	luak D1	luak <sup>7</sup>	luak <sup>7'</sup>	luak <sup>7'</sup>	--	luak <sup>7</sup> (LC)	luak <sup>7</sup> (BL)
to open (doors)	開 (門)	k <sup>h</sup> əj A(1)	k <sup>h</sup> e(j) <sup>1</sup>	k <sup>h</sup> ɔj <sup>1</sup>	k <sup>h</sup> ɛj <sup>1'</sup>	xəj <sup>2</sup>	xəj <sup>2</sup>	k <sup>h</sup> əj <sup>2</sup>
to pick up	撿	hum A1	hɔm <sup>1</sup>	hɔm <sup>1</sup>	hem <sup>1'</sup>	hum <sup>1</sup>	hum <sup>1</sup>	hum <sup>1</sup>
to pickle	醃	zə:m BC2	--	--	zum <sup>4</sup>	--	zəm <sup>4</sup>	ləm <sup>4</sup>
to pinch	掐、捏	ne:w BC1	mut <sup>7</sup>	new <sup>1</sup>	new <sup>3</sup>	--	--	nɛw <sup>3</sup>
to play	玩	ŋa:m A1	nam <sup>1</sup>	nam <sup>33</sup> -t	--	nam <sup>1</sup>	ŋam <sup>1</sup>	zam <sup>1</sup>
to pound (rice)	舂 (米)	na:m A2	nam <sup>2</sup>	nam <sup>2</sup>	nam <sup>2</sup>	nam <sup>2</sup>	nam <sup>2</sup>	nam <sup>2</sup>
to pull weeds	拔 (草)	vuk D2	--	vok <sup>8</sup>	vok <sup>8</sup>	vok <sup>8</sup>	vok <sup>8</sup>	--
to put down	放	bian BC1	bian <sup>3</sup>	bian <sup>3</sup>	bian <sup>3</sup>	bian <sup>3</sup>	bian <sup>3</sup>	bian <sup>3</sup>
to raise (children)	養	tian BC2	tian <sup>4</sup>	tian <sup>4</sup>	tian <sup>4</sup>	tian <sup>4</sup>	tian <sup>4</sup>	tian <sup>4</sup>
to return (home)	回 (家)	lə:ŋ A1	--	liŋ <sup>1</sup>	liŋ <sup>1'</sup> (L&Z)	--	ləŋ <sup>1</sup>	ləŋ <sup>1</sup>
to return (to pay back)	還	p <sup>h</sup> ə: BC2	p <sup>h</sup> e <sup>4</sup>	p <sup>h</sup> ɔ <sup>4</sup>	p <sup>h</sup> ɔ <sup>4</sup>	fo <sup>4</sup>	fo <sup>4</sup>	p <sup>h</sup> ɔ <sup>4</sup>
to ride (a	騎 (馬)	k <sup>h</sup> ə:j BC2	k <sup>h</sup> əj <sup>4</sup>	k <sup>h</sup> ɛj <sup>4</sup>	k <sup>h</sup> əj <sup>4</sup>	xəj <sup>4</sup>	xəj <sup>4</sup>	k <sup>h</sup> əj <sup>4</sup>



English	Chinese	Proto-Ong-Be	Changliu (長流)	Yongxing (永興)	Longtang (龍塘)	Qiaotou (橋頭)	Huangtong (皇桐)	Xinying (新盈)
horse)								
to run	跑	ɖiaw <sup>A2</sup>	ɖiaw <sup>2</sup>	ɖew <sup>2</sup>	ɖew <sup>2</sup>	ɖɛw <sup>2</sup>	ɖɛw <sup>2</sup>	ɖɛw <sup>2</sup>
to scratch	搔	ŋiaw <sup>A1</sup>	ŋiaw <sup>1</sup>	ŋiaw <sup>1</sup>	ŋiaw <sup>1'</sup>	ŋiaw <sup>1</sup>	ŋiaw <sup>1</sup>	ŋiaw <sup>1</sup> 'itchy'
to sell	賣	ʔiŋ <sup>BC1</sup>	ʔiŋ <sup>3</sup>	ʔiŋ <sup>3</sup>	ʔɛŋ <sup>3</sup>	ʔiŋ <sup>3</sup>	ʔiŋ <sup>3</sup>	ʔiŋ <sup>3</sup>
to sing (opera)	唱	siaŋ <sup>BC1</sup>	siaŋ <sup>3</sup>	siaŋ <sup>3</sup>	siaŋ <sup>3</sup>	siaŋ <sup>3</sup>	siaŋ <sup>3</sup>	siaŋ <sup>3</sup>
to sleep	睡覺	lap <sup>D1</sup> suan <sup>A1</sup>	lap <sup>7</sup> suan <sup>1</sup>	lap <sup>7'</sup>	lap <sup>7'</sup> sɛn <sup>1'</sup>	lap <sup>7</sup> suan <sup>1</sup>	lap <sup>7</sup>	lap <sup>7</sup> suan <sup>1</sup>
to smell	聞	ni:w <sup>BC1</sup>	niw <sup>3</sup>	niw <sup>3</sup>	niw <sup>3</sup>	niw <sup>3</sup>	ŋiw <sup>3</sup>	--
to speak	說、講	ka:ŋ <sup>BC1</sup>	kaŋ <sup>3</sup>	kaŋ <sup>3</sup>	kaŋ <sup>3</sup>	kaŋ <sup>3</sup>	kaŋ <sup>3</sup>	kaŋ <sup>3</sup>
to stand	站	ʒu:n <sup>A1</sup>	zun <sup>1</sup>	zun <sup>1</sup>	zun <sup>1</sup>	nun <sup>1</sup>	ŋun <sup>1</sup>	zun <sup>1</sup>
to steal	偷	zək <sup>D2</sup>	zək <sup>8</sup>	zək <sup>8</sup>	zək <sup>8'</sup>	zək <sup>8</sup>	lək <sup>8</sup>	lək <sup>8</sup>
to step on	踩、踐踏	ɖək <sup>D1</sup>	ɖək <sup>7</sup>	ɖək <sup>7</sup>	ɖək <sup>7</sup>	ɖək <sup>7</sup>	--	--
to sun-dry	曬	ɖa:k <sup>D1</sup>	ɖak <sup>7</sup>	ɖak <sup>7</sup>	ɖak <sup>7</sup>	ɖak <sup>7</sup>	ɖak <sup>7</sup>	ɖak <sup>7</sup>
to swallow	吞、嚥	lə:ʔ <sup>D1</sup>	ləʔ <sup>7</sup>	liʔ <sup>7'</sup>	liʔ <sup>7'</sup>	ləʔ <sup>7</sup>	ləʔ <sup>7</sup>	--
to swim	游 (泳)	zə:j <sup>A2</sup>	zɛ(j) <sup>2</sup>	--	zɛj <sup>2</sup>	zəj <sup>2</sup>	ləj <sup>2</sup>	ləj <sup>2</sup>
to take off; to remove; to untie	脫、解開	ke:ʔ <sup>D1</sup>	keʔ <sup>7</sup>	keʔ <sup>7'</sup>	keʔ <sup>7'</sup>	kɛʔ <sup>7</sup>	kɛʔ <sup>7</sup>	kɛʔ <sup>7</sup>
to take; to fetch	拿	ʔu: <sup>A1</sup>	ʔow <sup>1</sup>	ʔow <sup>1</sup>	ʔɔ <sup>1</sup>	ʔow <sup>1</sup>	ʔow <sup>1</sup>	--
to teach	教	maj <sup>A1</sup>	--	maj <sup>1</sup>	mɛj <sup>1'</sup>	maj <sup>1</sup>	maj <sup>1</sup>	--
to tie	綁	kat <sup>D2</sup>	kat <sup>8</sup>	kat <sup>8</sup>	kɛt <sup>8'</sup>	kat <sup>8</sup>	kat <sup>8</sup>	kat <sup>8</sup>
to transplant (rice seedling)	種 (稻)	zəm <sup>A1</sup>	zom <sup>1</sup>	zom <sup>1</sup>	zom <sup>1</sup>	zom <sup>1</sup>	lom <sup>1</sup>	lom <sup>1</sup>
to vomit	嘔吐	ɖuak <sup>D2</sup>	ɖuak <sup>8</sup>	--	ɖuak <sup>8</sup>	ɖuak <sup>8</sup>	ɖuak <sup>8</sup>	ɖuak <sup>8</sup>
to wash (clothes)	洗 (衣服)	ɖak <sup>D2</sup>	ɖak <sup>8</sup>	ɖak <sup>8</sup>	ɖɛk <sup>8'</sup>	ɖak <sup>8</sup>	ɖak <sup>8</sup>	ɖak <sup>8</sup>
to wash (hands)	洗 (手)	tu:k <sup>D1</sup>	tuk <sup>7</sup>	tuk <sup>7'</sup>	tuk <sup>7'</sup>	tuk <sup>7</sup>	tuk <sup>7</sup>	tuk <sup>7</sup>
to wear; to put on	穿 (衣)	ɖi:ŋ <sup>A1</sup>	ɖiŋ <sup>1</sup>	ɖiŋ <sup>1</sup>	ɖiŋ <sup>1'</sup>	ɖiŋ <sup>1</sup>	ɖiŋ <sup>1</sup>	ɖiŋ <sup>1</sup>
to write	寫字	tia <sup>BC1</sup>	tia <sup>3</sup>	tia <sup>3</sup>	tia <sup>3</sup>	tia <sup>3</sup>	tia <sup>3</sup>	tia <sup>3</sup>

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wet	溼	tsak <sup>D2</sup>	tsak <sup>8</sup>	tsak <sup>8</sup>	tsek <sup>8'</sup>	tsak <sup>8</sup>	tsak <sup>8</sup>	tsak <sup>8</sup>
white	白	p <sup>hi</sup> ak <sup>D2</sup>	p <sup>hi</sup> ak <sup>8</sup>	p <sup>hi</sup> ak <sup>8</sup>	p <sup>hi</sup> ak <sup>8</sup>	fiak <sup>8</sup>	fiak <sup>8</sup>	p <sup>hi</sup> ak <sup>8</sup>
wide	寬	k <sup>h</sup> uat <sup>D1</sup>	k <sup>h</sup> uat <sup>7</sup>	k <sup>h</sup> uat <sup>7'</sup>	k <sup>h</sup> uat <sup>7'</sup>	xuat <sup>7</sup>	xuat <sup>7</sup>	k <sup>h</sup> uat <sup>7</sup>
withered; wrinkle	枯萎、皺紋	ŋe:w <sup>BC1</sup>	new <sup>3</sup>	new <sup>3</sup>	new <sup>3</sup>	nɛw <sup>3</sup>	ŋɛw <sup>3</sup>	zɛw <sup>3</sup>
yellow	黃	la:ŋ <sup>A1</sup>	laŋ <sup>1</sup>	laŋ <sup>1</sup>	laŋ <sup>1</sup>	laŋ <sup>1</sup>	laŋ <sup>1</sup>	laŋ <sup>1</sup>
young	年輕	ʔu:n <sup>BC1</sup>	ʔun <sup>3</sup>	ʔun <sup>3</sup>	ʔun <sup>3</sup>	ʔun <sup>3</sup>	ʔun <sup>3</sup>	ʔun <sup>3</sup>
<b>6. Material Culture</b>								
bamboo hat; straw hat	斗笠、草帽	la:ŋ <sup>BC1</sup>	laŋ <sup>3</sup>	laŋ <sup>3</sup>	laŋ <sup>3</sup>	laŋ <sup>3</sup>	laŋ <sup>3</sup>	laŋ <sup>3</sup>
bamboo mat	蓆子	zi:w <sup>BC2</sup>	ziw <sup>4</sup>	ziw <sup>4</sup>	ziw <sup>4</sup>	ziw <sup>4</sup>	liw <sup>4</sup>	liw <sup>4</sup>
big cymbals	大鈸	sa: <sup>BC1</sup>	sa <sup>3</sup> p <sup>ho</sup> 55	--	sa <sup>3</sup> p <sup>ho</sup> 2	t <sup>sa</sup> 1 -i f <sup>o</sup> 2	t <sup>sa</sup> 3	sa <sup>3</sup> p <sup>ho</sup> 2
boat	船	zua <sup>A2</sup>	zua <sup>2</sup>	zua <sup>2</sup>	zua <sup>2</sup>	zua <sup>2</sup>	lua <sup>2</sup>	lua <sup>2</sup>
bowl	碗	hu:j <sup>BC2</sup>	hoj <sup>4</sup>	huj <sup>4</sup>	huj <sup>4</sup>	huj <sup>4</sup>	huj <sup>4</sup>	huj <sup>4</sup>
bridge	橋	k <sup>hi</sup> :w <sup>A2</sup>	k <sup>he</sup> w <sup>2</sup>	k <sup>hi</sup> w <sup>2</sup>	k <sup>hi</sup> w <sup>2</sup>	xiw <sup>2</sup>	xiw <sup>2</sup>	k <sup>hi</sup> w <sup>2</sup>
car	車	sia <sup>A1</sup>	sia <sup>1</sup>	sia <sup>1</sup>	sia <sup>1</sup>	sia <sup>1</sup>	sia <sup>1</sup>	sia <sup>1</sup>
chopping board	砧板	tsim <sup>A1</sup>	tsɔm <sup>1</sup>	tsɔm <sup>1</sup>	tsem <sup>1'</sup>	tsəm <sup>1</sup>	tsim <sup>1</sup>	tsim <sup>1</sup>
chopsticks	筷子	sə:w <sup>BC2</sup>	so <sup>4</sup> ; səw <sup>4</sup> (Xin)	səw <sup>4</sup>	sə <sup>4</sup>	səw <sup>4</sup>	səw <sup>4</sup>	səw <sup>4</sup>
cloth	布	həp <sup>D2</sup>	həp <sup>8</sup>	həp <sup>8</sup>	hep <sup>8'</sup>	hɔp <sup>8</sup>	hɔp <sup>8</sup>	hɔp <sup>8</sup>
clothes	衣服	zua <sup>BC1</sup>	k <sup>ho</sup> 3 zua <sup>3</sup>	zua <sup>3</sup>	zua <sup>3</sup>	zua <sup>3</sup>	xo <sup>3</sup> zua <sup>3</sup>	k <sup>ho</sup> 3 zua <sup>3</sup>
comb	梳子	haj <sup>A1</sup>	həj <sup>1</sup>	haj <sup>1</sup>	hej <sup>1'</sup>	haj <sup>1</sup>	haj <sup>1</sup>	haj <sup>1</sup>
cooking pot; wok	炒菜鍋	ɬu: <sup>A1</sup>	ɬow <sup>1</sup>	ɬow <sup>1</sup>	ɬew <sup>1'</sup>	ɬow <sup>1</sup>	ɬow <sup>1</sup>	ɬow <sup>1</sup>
cup	杯	tsu:ŋ <sup>A1</sup>	tson <sup>1</sup>	tsun <sup>1</sup>	tsun <sup>1'</sup>	tsun <sup>1</sup>	tsun <sup>1</sup>	tsun <sup>1</sup>
ditch	水溝、 灌溉溝渠	maŋ <sup>A1</sup>	maŋ <sup>1</sup>	maŋ <sup>1</sup>	meŋ <sup>1'</sup>	maŋ <sup>1</sup>	maŋ <sup>1</sup>	maŋ <sup>1</sup>
drum	鼓	luŋ <sup>A1</sup>	lon <sup>1</sup>	lon <sup>1</sup>	lon <sup>1'</sup>	luŋ <sup>1</sup>	lon <sup>1</sup>	lon <sup>1</sup>
fan	扇子	p <sup>h</sup> ə:j <sup>A2</sup>	p <sup>h</sup> əj <sup>2</sup>	p <sup>h</sup> əj <sup>2</sup>	p <sup>h</sup> əj <sup>2</sup>	fəj <sup>2</sup>	fəj <sup>2</sup>	p <sup>h</sup> əj <sup>2</sup>
fish hook	魚鉤	ti:n <sup>BC1</sup>	tin <sup>3</sup> ɬa <sup>1</sup>	tin <sup>3</sup>	tin <sup>3</sup>	tin <sup>3</sup>	tin <sup>3</sup>	tin <sup>3</sup>

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fish net	漁網	saj <sup>BC1</sup>	sqj <sup>3</sup>	saj <sup>3</sup>	saj <sup>3</sup>	saj <sup>3</sup>	saj <sup>3</sup>	saj <sup>3</sup>
gong	鑼	lə: <sup>A2</sup>	p <sup>h</sup> an <sup>3</sup> le <sup>2</sup>	ɗun <sup>33</sup> lo <sup>2</sup>	ɗun <sup>4</sup> lo <sup>2</sup>	lo <sup>2</sup>	lo <sup>2</sup>	lo <sup>2</sup>
hoe	鋤頭 (鏟)	kuak <sup>D1</sup>	kuak <sup>7</sup>	kuak <sup>7'</sup>	kuak <sup>7'</sup>	kuak <sup>7</sup>	kuak <sup>7</sup>	--
house	房屋	za:n <sup>A2</sup>	zan <sup>2</sup>	zan <sup>2</sup>	zan <sup>2</sup>	zan <sup>2</sup>	zan <sup>2</sup>	lan <sup>2</sup>
iron	鐵	he:t <sup>D1</sup>	het <sup>7</sup>	hiat <sup>7'</sup>	het <sup>7'</sup>	het <sup>7</sup>	het <sup>7</sup>	het <sup>7</sup>
kitchen range	灶	tsa:w <sup>BC1</sup>	tsaw <sup>3</sup> loŋ <sup>2</sup>	tsaw <sup>3</sup>	tsaw <sup>3</sup>	tsaw <sup>3</sup>	tsaw <sup>3</sup>	tsaw <sup>3</sup>
knife	刀子	mi:t <sup>D2</sup>	mit <sup>8</sup>	mit <sup>8</sup>	mit <sup>8'</sup>	mit <sup>8</sup>	mit <sup>8</sup>	mit <sup>8</sup>
long bench	長凳	ɗəŋ <sup>BC1</sup>	ɗoŋ <sup>3</sup>	ɗoŋ <sup>3</sup>	ɗoŋ <sup>3</sup>	ɗoŋ <sup>3</sup>	ɗoŋ <sup>3</sup>	ɗoŋ <sup>3</sup>
loom	紡織機	ɗə:k <sup>D2</sup>	zan <sup>2</sup> ɗək <sup>8</sup>	ɗot <sup>8</sup> ɗək <sup>8</sup>	zan <sup>2</sup> ɗək <sup>8'</sup> (L&Z)	--	lan <sup>2</sup> ɗək <sup>8</sup> (BL)	--
mortar	石臼	huk <sup>D2</sup>	huak <sup>8</sup>	--	hok <sup>8</sup>	hok <sup>8</sup>	hok <sup>8</sup>	hok <sup>8</sup>
needle	針	ŋaʔ <sup>D2</sup>	ŋaʔ <sup>8</sup>	ŋaʔ <sup>8</sup>	ŋaʔ <sup>8'</sup>	ŋaʔ <sup>8</sup>	ŋaʔ <sup>8</sup>	ŋaʔ <sup>8</sup>
paddle	船槳	tsaw <sup>A2</sup> ; lo <sup>BC1</sup>	lo <sup>3</sup> ; tsaw <sup>2</sup>	--	--	tsaw <sup>2</sup> ; lo <sup>3</sup>	--	tsaw <sup>2</sup> ; lo <sup>3</sup>
pants	褲子	k <sup>h</sup> o: <sup>BC1</sup>	k <sup>h</sup> o <sup>3</sup>	k <sup>h</sup> o <sup>3</sup>	k <sup>h</sup> o <sup>3</sup>	xo <sup>3</sup>	xo <sup>3</sup>	k <sup>h</sup> o <sup>3</sup>
pen	筆	bit <sup>D1</sup>	bat <sup>7</sup>	bət <sup>7'</sup>	bət <sup>7'</sup>	bət <sup>7</sup>	bit <sup>7</sup>	bit <sup>7</sup>
pestle	杵	ha:k <sup>D1</sup>	hak <sup>7</sup>	hak <sup>7</sup> ɗoj <sup>3</sup>	--	hak <sup>7</sup>	hak <sup>7</sup>	--
pillar; pole	柱子	hu: <sup>BC1</sup>	--	kok <sup>7'</sup> hɔw <sup>1</sup>	hew <sup>1'</sup>	hɔw <sup>1</sup>	hɔw <sup>1</sup>	hɔw <sup>1</sup>
plow	犁	ləj <sup>A2</sup>	le(j) <sup>2</sup>	loj <sup>2</sup>	loj <sup>2</sup>	loj <sup>2</sup>	loj <sup>2</sup>	loj <sup>2</sup>
rake	耙	p <sup>h</sup> a: <sup>A2</sup>	p <sup>h</sup> a <sup>2</sup>	p <sup>h</sup> a <sup>2</sup>	p <sup>h</sup> a <sup>2</sup>	fa <sup>2</sup>	fa <sup>2</sup>	p <sup>h</sup> a <sup>2</sup>
road	路	sun <sup>A1</sup>	son <sup>1</sup>	son <sup>1</sup>	sen <sup>1'</sup>	sun <sup>1</sup>	sun <sup>1</sup>	sun <sup>1</sup>
rope	繩子	ɗa:k <sup>D2</sup>	ɗak <sup>8</sup>	ɗak <sup>8</sup>	ɗak <sup>8</sup>	ɗak <sup>8</sup>	ɗak <sup>8</sup>	ɗak <sup>8</sup>
shoes	鞋子	ha:j <sup>A2</sup>	haj <sup>2</sup>	haj <sup>2</sup>	haj <sup>2</sup>	haj <sup>2</sup>	haj <sup>2</sup>	haj <sup>2</sup>
shoulder pole	扁擔	va:n <sup>A1</sup>	ban <sup>2</sup>	van <sup>2</sup>	van <sup>2</sup>	van <sup>2</sup>	van <sup>2</sup>	van <sup>2</sup>
shuttle	梭子	ɗaŋ <sup>BC2</sup> ɗə:k <sup>D2</sup>	ɗoŋ <sup>4</sup> ɗək <sup>8</sup>	--	--	ɗaŋ <sup>4</sup> ɗək <sup>8</sup>	ɗaŋ <sup>4</sup> ɗək <sup>8</sup>	--
silk	絲	təj <sup>A1</sup>	tej <sup>4</sup> -t	ti <sup>1</sup>	ti <sup>1</sup>	təj <sup>1</sup>	təj <sup>1</sup>	təj <sup>1</sup>
small cymbals	小鈸	tse: <sup>BC1</sup>	--	tsom <sup>2</sup> tse <sup>1</sup>	tsom <sup>2</sup> tse <sup>1</sup>	--	tse <sup>1</sup>	tse <sup>1</sup>
straw rain cape	蓑衣	tə:j <sup>BC2</sup>	tej <sup>4</sup>	tej <sup>4</sup>	tej <sup>4</sup>	təj <sup>4</sup>	təj <sup>4</sup>	təj <sup>4</sup>
table	桌	ta:ŋ <sup>A2</sup>	taŋ <sup>2</sup>	taŋ <sup>2</sup>	taŋ <sup>2</sup>	--	--	--
temple	廟	mi:w <sup>BC2</sup>	mew <sup>4</sup>	miw <sup>4</sup>	miw <sup>4</sup>	miw <sup>4</sup>	miw <sup>4</sup>	lan <sup>2</sup> miw <sup>4</sup>

English	Chinese	Proto-Ong-Be	Changliu (長流)	Yongxing (永興)	Longtang (龍塘)	Qiaotou (橋頭)	Huangtong (皇桐)	Xinying (新盈)
thatched cottage	茅草房	za:n <sup>A2</sup> tia <sup>A2</sup>	zan <sup>2</sup> tia <sup>2</sup>	zan <sup>2</sup> tia <sup>2</sup>	zan <sup>2</sup> bat <sup>7'</sup> tia <sup>2</sup>	zan <sup>2</sup> tia <sup>2</sup>	zan <sup>2</sup> tia <sup>2</sup>	lan <sup>2</sup> tia <sup>2</sup>
thing; object	東西、物件	kəw <sup>BC2</sup>	kew <sup>4</sup>	kəw <sup>4</sup>	kəw <sup>4</sup>	kəw <sup>4</sup>	kəw <sup>4</sup>	kəw <sup>4</sup>
thread	線	mi: <sup>A1</sup>	mɔj <sup>1</sup>	mɔj <sup>1</sup>	mɛj <sup>1'</sup>	mɔj <sup>1</sup>	mɔj <sup>1</sup>	mɔj <sup>1</sup>
tile	瓦(片)	ɲua <sup>BC2</sup>	ɲua <sup>4</sup>	ɲua <sup>4</sup>	ɲua <sup>4</sup>	ɲua <sup>4</sup>	ɲua <sup>4</sup>	ɲua <sup>4</sup>
village	村子	və: <sup>BC1</sup>	bə <sup>3</sup>	və <sup>3</sup>	və <sup>3</sup>	və <sup>3</sup>	və <sup>3</sup>	və <sup>3</sup>
well	井	ʒaŋ <sup>A1</sup>	zaŋ <sup>1</sup>	zaŋ <sup>1</sup>	zeŋ <sup>1'</sup>	ʒaŋ <sup>1</sup>	ʒaŋ <sup>1</sup>	ʒaŋ <sup>1</sup>
windows	窗	suaŋ <sup>A1</sup>	suaŋ <sup>1</sup>	suaŋ <sup>1</sup>	suaŋ <sup>1</sup>	suaŋ <sup>1</sup>	suaŋ <sup>1</sup>	bak <sup>7</sup> suaŋ <sup>1</sup>
winnowing basket	篩子	zəŋ <sup>A2</sup>	zəŋ <sup>2</sup>	zəŋ <sup>2</sup>	zəŋ <sup>2</sup>	zəŋ <sup>2</sup>	ləŋ <sup>2</sup>	ləŋ <sup>2</sup>
yoke	牛軛	ʔik <sup>D1</sup>	ʔek <sup>7</sup>	ʔek <sup>7'</sup>	ʔek <sup>7'</sup>	ʔek <sup>7</sup>	ʔek <sup>7</sup>	ʔek <sup>7</sup>
<b>7. Food</b>								
cooked rice	乾飯	ɲa:j <sup>A2</sup>	ɲaj <sup>2</sup>	ɲaj <sup>2</sup>	ɲaj <sup>2</sup>	ɲaj <sup>2</sup>	ɲaj <sup>2</sup>	ɲaj <sup>2</sup>
cooked rice; juuk	飯; 稀飯	tia <sup>BC2</sup> ; phja <sup>BC2</sup>	nam <sup>4</sup> tia <sup>4</sup>	tia <sup>4</sup>	tia <sup>4</sup>	nam <sup>4</sup> fia <sup>4</sup>	nam <sup>4</sup> fia <sup>4</sup>	nam <sup>4</sup> phja <sup>4</sup>
meat; flesh	肉	nan <sup>BC2</sup>	nan <sup>4</sup>	nan <sup>4</sup>	nan <sup>4</sup>	nan <sup>4</sup>	nan <sup>4</sup>	nan <sup>4</sup>
medicine	藥	zia <sup>A1</sup>	zia <sup>1</sup>	zia <sup>1</sup>	zia <sup>1</sup>	zia <sup>1</sup>	zia <sup>1</sup>	zia <sup>1</sup>
salt	鹽	ɲa:w <sup>BC1</sup>	naw <sup>3</sup>	naw <sup>3</sup>	naw <sup>3</sup>	naw <sup>3</sup>	ɲaw <sup>3</sup>	zaw <sup>3</sup>
soup	湯	so: <sup>BC1</sup>	ho <sup>3</sup>	so <sup>3</sup>	so <sup>3</sup>	so <sup>3</sup>	so <sup>3</sup>	so <sup>3</sup>
to have breakfast	吃早餐	kən <sup>A1</sup> tsaw <sup>BC1</sup>	kən <sup>1</sup> tia <sup>4</sup> tsaw <sup>3</sup>	kən <sup>1</sup> tia <sup>4</sup> tsaw <sup>3</sup>	--	kən <sup>1</sup> tsaw <sup>3</sup>	kən <sup>1</sup> tsaw <sup>3</sup>	kən <sup>1</sup> tsaw <sup>3</sup>
liquor	酒	ʒan <sup>BC1</sup>	zan <sup>3</sup>	zan <sup>3</sup>	zan <sup>3</sup>	ʒan <sup>3</sup>	ʒan <sup>3</sup>	ʒan <sup>3</sup>
lunch	吃中餐	kən <sup>A1</sup> bak <sup>D2</sup>	kən <sup>1</sup> bak <sup>8</sup>	kən <sup>1</sup> bak <sup>8</sup>	kən <sup>1'</sup> bək <sup>8'</sup> 'breakfast'	kən <sup>1</sup> bak <sup>8</sup>	--	kən <sup>1</sup> bak <sup>8</sup>
to have dinner	吃晚餐	kəm <sup>BC2</sup>	kən <sup>1</sup> kim <sup>4</sup>	kən <sup>1</sup> kom <sup>4</sup>	kən <sup>1'</sup> kom <sup>4</sup>	kən <sup>1</sup> kom <sup>4</sup>	kən <sup>1</sup> kom <sup>4</sup>	kən <sup>1</sup> kom <sup>4</sup>
zongzi	粽子	ʔo:t <sup>D1</sup>	ʔot <sup>7</sup>	ʔot <sup>7</sup>	ʔot <sup>7</sup>	ʔot <sup>7</sup>	ʔot <sup>7</sup>	ʔot <sup>7</sup>
<b>8. Kinship</b>								
child; offspring	孩子	lə:k <sup>D2</sup>	lək <sup>8</sup> lak <sup>7</sup>	lək <sup>8</sup> lak <sup>7'</sup>	lək <sup>8'</sup>	lək <sup>8</sup>	lək <sup>8</sup>	lək <sup>8</sup>

English	Chinese	Proto-Ong-Be	Changliu (長流)	Yongxing (永興)	Longtang (龍塘)	Qiaotou (橋頭)	Huangtong (皇桐)	Xinying (新盈)
grandchildren	孫	la:n <sup>A1</sup>	lan <sup>1</sup>	lan <sup>1</sup>	lan <sup>1</sup>	lan <sup>1</sup>	lan <sup>1</sup>	lan <sup>1</sup>
man	男人	k <sup>h</sup> ian <sup>BC2</sup>	--	--	lek <sup>8</sup> k <sup>h</sup> ian <sup>4</sup>	da <sup>3</sup> xian <sup>4</sup>	da <sup>3</sup> xian <sup>4</sup>	da <sup>3</sup> k <sup>h</sup> ian <sup>4</sup>
woman	女人	ma:j <sup>BC2</sup> lə:k <sup>D2</sup>	--	maj <sup>4</sup> lek <sup>8</sup>	maj <sup>4</sup> lek <sup>8</sup>	maj <sup>4</sup> lek <sup>8</sup>	maj <sup>4</sup> lek <sup>8</sup>	maj <sup>4</sup> lek <sup>8</sup>
younger sibling	弟、妹	nun <sup>BC2</sup>	non <sup>4</sup>	non <sup>4</sup>	non <sup>4</sup>	nun <sup>4</sup>	nun <sup>4</sup> (LC)	--
<b>9. Miscellaneous</b>								
name	名字	ni: <sup>A1</sup>	noj <sup>1</sup>	noj <sup>1</sup>	nej <sup>1</sup>	noj <sup>1</sup>	noj <sup>1</sup>	noj <sup>1</sup>
and	和	he:m <sup>A1</sup>	hem <sup>1</sup>	hem <sup>1</sup>	--	hem <sup>1</sup>	hem <sup>1</sup>	hem <sup>1</sup>
each other; mutual	互相	kən <sup>A2</sup>	kɔn <sup>2</sup>	kɔn <sup>2</sup>	kɔn <sup>2</sup>	kɔn <sup>2</sup>	kɔn <sup>2</sup>	kɔn <sup>2</sup>
negator	不	mə:n <sup>A2</sup>	mən <sup>2</sup> 'to have'	mən <sup>2</sup> 'to have'	mən <sup>2</sup> 'to have'	mən <sup>2</sup>	mən <sup>2</sup>	mən <sup>2</sup>
a stretch of arms	度 (兩臂伸 長的長度)	təm <sup>A1</sup>	tom <sup>1</sup>	tom <sup>1</sup>	tom <sup>35</sup>	tɔm <sup>1</sup>	tɔm <sup>1</sup>	tɔm <sup>1</sup>
above	上 (面)	zu:ŋ <sup>A1</sup>	p <sup>h</sup> ian <sup>3</sup> zɔŋ <sup>1</sup>	haŋ <sup>55</sup> zuŋ <sup>1</sup>	heŋ <sup>2</sup> zuŋ <sup>1</sup>	ɔŋ <sup>2</sup> ʒuŋ <sup>1</sup>	--	p <sup>h</sup> iak <sup>8</sup> loŋ <sup>1</sup> -v
below	下 (面)	ɖa:w <sup>A2</sup>	p <sup>h</sup> ian <sup>3</sup> ɖaw <sup>2</sup>	haŋ <sup>55</sup> ɖaw <sup>2</sup>	heŋ <sup>2</sup> ɖaw <sup>2</sup>	ɔŋ <sup>1</sup> ɖaw <sup>2</sup> ; ɖaw <sup>2</sup> nin <sup>4</sup>	ɖaw <sup>2</sup> nin <sup>4</sup>	p <sup>h</sup> iak <sup>8</sup> ɖaw <sup>2</sup>
outside	外面	ʔu:k <sup>D1</sup>	p <sup>h</sup> ian <sup>3</sup> ʔuk <sup>7</sup>	haŋ <sup>55</sup> ʔik <sup>7</sup>	heŋ <sup>2</sup> ʔok <sup>7</sup>	ɔŋ <sup>2</sup> ʔuk <sup>7</sup>	ʔuk <sup>7</sup> nin <sup>4</sup>	p <sup>h</sup> iak <sup>8</sup> ʔuk <sup>7</sup>
month	月份	ŋi:t <sup>D2</sup>	ŋit <sup>8</sup>	ŋit <sup>8</sup>	ŋit <sup>8</sup>	ŋit <sup>8</sup>	ŋit <sup>8</sup>	ŋit <sup>8</sup>
year	年	və:j <sup>A2</sup>	bɛj <sup>2</sup>	vɛj <sup>2</sup>	vɛj <sup>2</sup>	vəj <sup>2</sup>	vəj <sup>2</sup>	vəj <sup>2</sup>
morning	早上	tsa:w <sup>BC1</sup>	zan <sup>2</sup> tsaw <sup>3</sup>	ɖa <sup>1</sup> tsaw <sup>3</sup>	ɖa <sup>1</sup> bɛk <sup>8</sup> tsaw <sup>3</sup>	tsaw <sup>3</sup> tsaw <sup>3</sup>	tsaw <sup>3</sup> tsaw <sup>3</sup>	tsaw <sup>3</sup> tsaw <sup>3</sup>
afternoon	下午	tsəw <sup>A2</sup>	zan <sup>2</sup> tsew <sup>2</sup>	ɖa <sup>3</sup> tsow <sup>2</sup>	--	vən <sup>2</sup> tsow <sup>2</sup>	vən <sup>2</sup> tsow <sup>2</sup>	vən <sup>2</sup> tsow <sup>2</sup>
night	夜晚	kəm <sup>BC2</sup>	kim <sup>4</sup>	kom <sup>4</sup>	kom <sup>4</sup>	kom <sup>4</sup>	kɔm <sup>4</sup>	kɔm <sup>4</sup>
the day after tomorrow	後天	zə: <sup>A2</sup>	ɔŋ <sup>55</sup> ze <sup>2</sup>	ɔŋ <sup>55</sup> zɔ <sup>2</sup>	ɖeŋ <sup>55</sup> zɔ <sup>2</sup>	ɔŋ <sup>21</sup> ʒo <sup>2</sup>	ɔŋ <sup>3</sup> lo <sup>2</sup>	ɔŋ <sup>3</sup> lo <sup>2</sup>
two days after tomorrow	大後天	lu: <sup>BC1</sup>	ɔŋ <sup>55</sup> lo <sup>3</sup>	ɔŋ <sup>55</sup> lo <sup>3</sup>	ɖeŋ <sup>55</sup> lo <sup>3</sup>	ɔŋ <sup>4</sup> lo <sup>3</sup>	ɔŋ <sup>3</sup> lo <sup>3</sup>	ɔŋ <sup>3</sup> lo <sup>3</sup>
tomorrow	明天	vin <sup>A2</sup> tsə:k <sup>D2</sup>	bən <sup>2</sup> tsək <sup>8</sup>	vɔn <sup>2</sup> tsək <sup>8</sup>	vɔn <sup>2</sup> tsək <sup>8</sup>	bək <sup>7</sup> tsək <sup>8</sup>	bək <sup>7</sup> tsək <sup>8</sup>	bək <sup>7</sup> tsək <sup>8</sup>
yesterday	昨天	vin <sup>A2</sup> va: <sup>A2</sup>	bən <sup>2</sup> ɖa <sup>1</sup> -t	vɔn <sup>2</sup> va <sup>2</sup>	vɔn <sup>2</sup> va <sup>2</sup>	vən <sup>2</sup> va <sup>2</sup>	vən <sup>2</sup> va <sup>2</sup>	vən <sup>2</sup> va <sup>2</sup>

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the day before yesterday	前天	hə:n <sup>A1</sup>	ɸan <sup>2</sup> hən <sup>1</sup>	vɔn <sup>2</sup> hin <sup>1</sup>	vɔn <sup>2</sup> hin <sup>1</sup>	vən <sup>2</sup> hən <sup>1</sup>	vən <sup>2</sup> hən <sup>1</sup>	vən <sup>2</sup> hən <sup>1</sup>
two days before yesterday	大前天	vin <sup>A2</sup> zə:ŋ <sup>BC1</sup>	--	vɔn <sup>2</sup> zɛŋ <sup>3</sup>	vɔn <sup>2</sup> zɛŋ <sup>3</sup>	vən <sup>2</sup> ʒəŋ <sup>3</sup>	vən <sup>2</sup> ləŋ <sup>3</sup>	vən <sup>2</sup> ləŋ <sup>3</sup>
east	東	ɖuŋ <sup>A1</sup>	ɖoŋ <sup>1</sup>	ɖoŋ <sup>1</sup>	ɖoŋ <sup>1'</sup>	ɖuŋ <sup>1</sup>	ɖoŋ <sup>1</sup>	ɖoŋ <sup>1</sup>
west	西	ti: <sup>A1</sup>	tɔj <sup>1</sup>	tɔj <sup>1</sup>	tɛj <sup>1'</sup>	tɔj <sup>1</sup>	tɔj <sup>1</sup>	tɔj <sup>1</sup>
south	南	nəm <sup>A2</sup>	nim <sup>2</sup>	nom <sup>2</sup>	nom <sup>2</sup>	nom <sup>2</sup>	nɔm <sup>2</sup>	nɔm <sup>2</sup>
north	北	ɸə:k <sup>D1</sup>	ɸək <sup>7</sup>	ɸik <sup>7'</sup>	ɸik <sup>7'</sup>	ɸək <sup>7</sup>	ɸək <sup>7</sup>	ɸək <sup>7</sup>

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