

## An Inquiry into Kbalan Phonology

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### I. Introduction

Kbalan is an aboriginal language of Formosa. It belongs to the Austronesian linguistic family as do the other indigenous languages of Formosa. The language name has been given various as Cabelang, Cabbalan, Kalewan, Kibalan, Kaliawan, Kavalan, Kvalan, Kbalan etc..<sup>1)</sup> The preference is given here to Kbalan since this is the term used by the people to refer to their own language. Most of the people of Kbalan are sinicized and are tri- or quatro-lingual.

Kbalan is spoken at the east coast of Formosa. It has at least three dialects, one formerly spoken in Ilan Prefecture, a second spoken in the northern part of Hualien Prefecture and a third spoken in the southern part of Hualien Prefecture.<sup>2)</sup> The dialect in Ilan is no longer spoken and the northern Hualien dialect is moribund. The southern Hualien dialect is the only source for our research.

Papers concerning the Kbalan language are very limited and there are very few researchers studying the language. Within a past few years only three papers concerning the language have been published: Li (1978), Li (1982), Moriguchi (1982). But the language and the people in Ilan have attracted many European missionaries and traders, because this area was believed to be rich in gold [Collingwood (1868), Murakami (1972) ]<sup>3)</sup>

Only two papers have been published on Kbalan phonology: Li (1982), Moriguchi (1982). Li (1982) focuses on diachronic and synchronic aspects of the phonology and Moriguchi (1982) discusses the accent in Kbalan. But Li (1982)

1) Cabelang, Cabbalang—Murakami (1972); Kibalan—Collingwood (1868); Kavalan—Li (1978, 1982) and other Chinese scholars.

2) The Kbalan people are widely dispersed along the east coast of Hualien prefecture in Formosa.

3) Murakami (1972) Vol. II, p. 283.

does not treat synchronic phonemic alternations and description of the language exhaustively and two interesting phenomena—Time-Duration Accent and Long Consonants—are not discussed in the paper. The first of these is discussed in Moriguchi (1982), and the second is discussed in this paper.

## II. Phonemic System

The phonemes in Kbalan are as follows: 13 consonants, 2 semi-vowels, 4 vowels and a time-duration accent.

### \*Consonants

	Bilabial	Dental <sup>4)</sup>	Alveolar	Velar	Uvular
Stop	p b	t		k	q (voiceless) (voiced)
Fricative		s z			ʁ (voiceless) (voiced)
Nasal	m	n		ŋ	
Lateral (Approximant)			l		
Lateral (Fricative)			lʒ		
*Semi-Vowels		w	y		
*Vowels		i		u	
			ə		
			a		
*Accent			/:/		

## III. Consonants

The Kbalan consonants are subdivided into 5 groups according to the manner of articulation and 5 groups according to the point of articulation.

4) The tongue blade not only touches the alveolar ridge, but also reaches to the back of the tongue, when the Kbalan dental/alveolar fricatives or stops are pronounced. As a result the point of articulation of the sound is just between alveolar ridge and teeth. The dental/alveolar fricatives and stops are equal neither to the alveolar stops nor to the dental fricatives in English.

## (1) Stops

Kbalan has four voiceless stops /p/, /t/, /k/ and /q/, and one voiced stop /b/.

## (A) Bilabial

/p/ is realized as [p]—[p<sup>h</sup>]—[p<sup>°</sup>].<sup>5)</sup> The phones [p] and [p<sup>h</sup>] are free variants, and the unexploded/unreleased bilabial stop [p<sup>°</sup>] is observed at the end of a word and before a voiceless stop.

/pi:laj/	[p <sup>h</sup> i:laj]	“to get tired”
/piŋi/	[piŋi <sup>ʔ</sup> ]	“cheek”
/pi:pis/	[pi:pis]	“temple (of head)”
/lapis/	[ɾapis]	“squirrel”
	[lapis]	
/i:zip/	[i:zi <sup>°</sup> p]	“body”
/mainəp/	[mainə <sup>°</sup> p]	“to sleep”

/b/ is realized as [b]~[b<sup>h</sup>]~[β]~[b<sup>°</sup>], the first two of which are free variants and the last two of which are in complementary distribution with [b]. The bilabial voiced fricative [β] is found between two vowels, especially two high front vowels, and the unaspirated bilabial voiced stop [b<sup>°</sup>] is found at the end of a word or before a voiceless stop.

## /b/

/baut/	[baot <sup>°</sup> ]	“fish”
/bəʔas/	[bəʔas]	“rice”
/lubuŋ/	[lubuŋ]	“skin”
	[ɾlubuŋ]	
/i:nəb/	[ʔi:nə <sup>°</sup> b]	“door”
/plubuk/	[plubok <sup>°</sup> ]	“muscle”
/si:ʔab]	[ʃi:ʔab <sup>°</sup> ]	“yesterday”
/ŋibiʔ/	[ŋiβiæχ]	“mouth”
/səbtau/	[səb <sup>°</sup> taoʔ]	“to sink”
/ti:bay/	[ti:bay]	“loin cloth” <sup>6)</sup>

(B) Dental/Alveolar<sup>7)</sup>

The dental/alveolar stop in Kbalan is realized as [t]~[t̥]~[t̪]~[t<sup>h</sup>]~[t<sup>°</sup>]. The unexploded/unreleased dental/alveolar stop articulation [t<sup>°</sup>] is found at the end of a word, and the palatalized stop [t̪] appears before the high front vowel /i/. The other phones are free variants.

5) [°] denotes an unexploded/unreleased stop and [h] does an aspirated stop. See Ladefoged (1975).

6) [ʃ] denotes palatalization.

7) See Footnote (4).

/t/		
/aita/	[ʔaitaʔ]	‘we (inclusive)’
/bantu/	[bantuʔ]	‘bad smell’
/ta:ni/	[tʰa:niʔ]	‘how many’
/tazuq/	[tʰazɔq <sup>o</sup> ]	‘rice plant’
/zimmət/	[zim:ɣt <sup>o</sup> ]	‘sticky rice’
/kaput/	[kʰapɔt <sup>o</sup> ]	‘friend’
/tiləp/	[tiɬɣp <sup>o</sup> ]	‘latch’

## (C) Velar

/k/ is realized as [k]~[k<sup>h</sup>]~[k<sup>o</sup>]. The unexploded/unreleased phone [k<sup>o</sup>] appears at the end of a word; the other two phones vary freely.

/ka:yal/	[kʰa:yal]	‘ear’
/kəkəy/	[kɣkʰɣy]	‘cake, candy’
/kiyama/	[kiyamaʔ]	‘little amount; manggo’
/ku:wa/	[ku:waʔ]	‘papaya’
/kiskis/	[kiskis]	‘to have hair cut’
/tumalik/	[tumalik <sup>o</sup> ]	‘to pound’
/lələk/	[lɣlɣk <sup>o</sup> ]	‘to hunt’
	[ɣɣk <sup>o</sup> ]	

/k/ is different from /q/, which is shown in the minimal pairs below:

/ta:kan/	‘desk, bench’
/ta:qan/	‘pillar, post’
/sumakay/	‘bead, necklace’
/sumaqaq/	‘to walk, to take a walk’

## (D) Uvular

/q/ is realized as [q]~[q<sup>o</sup>], the latter articulation being found in final position.

/ʙaq/	[ʙaq <sup>o</sup> ]	‘liquor’
/sa:waq/	[sa:waq <sup>o</sup> ]	‘waist’
/qaiyul/	[qaiyol]	‘hawk’
/qu:bin/	[qo:bin]	‘whisker’
/bu:qas/	[bu:qas]	‘hair’
/pu:qaw/	[pu:qaw]	‘blind’

## (2) Fricatives

There are three Kbalan fricatives: /s/, /z/, and /ʙ/.

## (A) Dental/Alveolar

In the Kbalan language there are two dental/alveolar fricatives: /s/ and /z/.

/s/

/s/ is realized as a palato-alveolar fricative [ʃ] before the high front vowel /i/ and as a dental/alveolar fricative [s] elsewhere.

/salu/	[saluʔ]	“pumpkin”
/sammay/	[sam:ay]	“to cook rice”
/blaisan/	[blaisan]	“sorghum”
/kalsuab/	[kalsoab <sup>o</sup> ]	“yawning”
/puβtas/	[p <sup>h</sup> oβtas]	“tumor”
/si:su/	[ʃi:suʔ]	“breast”
/missi/	[miʃ:iʔ]	“to be fat”
/qasi/	[qaʃiʔ]	“mosquito net”

/z/ is realized as [z]~[ʒ] in complementation. The palato-alveolar voiced fricative [ʒ] is the realization before the high front vowel /i/, and the dental/alveolar voiced fricative [z] the realization before any phoneme other than /i/.

/zimmət/	[ʒim:ət <sup>o</sup> ]	“rice”
/ziin/	[ʒiin]	“sea”
/u:zis/	[ʔu:ʒis]	“to bathe”
/zais/	[zais]	“face”
/za:num/	[za:num]	“water”
/si:zu/	[ʃi:zuʔ]	“scapula”
/zizəŋ/	[ʒizəŋ]	“mole on skin”
/tu:suz/	[tu:suz]	“knee”

/z/ is different from /lz/, which is shown below:

/silzi/	[ʃilziʔ]	“pepper”
/sizi/	[ʃiziʔ]	“goat”

## (B) Uvular

The uvular phoneme /β/ is realized as three variants in complementary distribution.

## (B-1) Voiceless Uvular Fricative

The phone [χ] appears

- |  |    |
|--|----|
| (a) at the end of a word                                       | or |
| (b) between long high vowel /i:/ and short/long high vowel /i/ | or |
| (c) at the end of a morpheme (+)                               | or |
| (d) at the end of an affix (=) before a voiceless consonant.   |    |

/i:naβ/	[ʔi:naχ]	“hedge”
/iβuβ/	[ʔiβoχ]	“river”
/tiβuβ/	[tiβoχ]	“egg”

8) This condition is not so strict as the others.

/lzi:ʒib/	[di:χib <sup>o</sup> ]	“cave, hole”
/mi:ʒit/	[mi:χit <sup>o</sup> ]	“piper betel (good smelling)”
/ŋuʒ/+ /ŋuʒ/	[ŋoxŋox]	“animal’s mouth”
/qani/= /waʒ/+ /waʒ/	[qaniwaχwaχ]	“rainbow”
/maʒ/= /pʒap/	[maχpʒap <sup>o</sup> ]	“to burn a little”
/qaʒ/= /siaʒ/	[qaχfiaχ]	“quern”
/qaʒ/= /talz/	[qaχtalz]	“rust” 9) 10)

## (B-2) Uvular stop

The phone [χ] appears after the velar nasal /ŋ/ or between a high mid front vowel /i/ and a high back vowel /u/.<sup>11)</sup>

/baŋʒaw/	[baŋχaw]	“tooth”
/baŋʒis/	[baŋχæis]	“tusk”
/ʒaiʒu/	[ʒaiχuʔ]	“not to know”

## (B-3) Voiced Uvular Fricative

The phoneme /ʒ/ is realized as [ʒ] elsewhere than in word-final or morpheme-final position or between two high mid front vowels or after a velar nasal or between /i/ and /u/.

/ʒaikum/	[ʒaikum]	“sea, big wave”
/ʒamalz/	[ʒamalz]	“fire”
/uʒat/	[ʔuʒat <sup>o</sup> ]	“tendon”
/qaimuʒiʒ/	[qaimoʒeχ]	“crazy”
/pu:ʒas/	[po:ʒas]	“to burn”
/biʒi/	[biʒeʔ]	“leave”
/iʒaʒ/	[ʔiʒaχ]	“hedge”
/iʒuʒ/	[ʔiʒoχ]	“river”
/paʒanʒan/	[paʒanʒan]	“to rest”

9) In some cases it depends on the speaker whether they use [χ] or [ʒ]:

/maʒ/= /suap/ “fast, abstinence from food”  
[maʒsuap]

and sometimes alternative pronunciations are observed:

/paʒ/= /azan/ “to build”  
[paχazan] and [paʒazan]

10) An affix or a root word, especially beginning with the vowel /a/ tends to change the voiceless uvular fricative into the voiced one, if suffixed:

/inaʒ/ → [inaχ] “hedge”  
/inaʒ/= /an/ → [inaʒan]  
/niniʒ/— /na/— /sabaq/ (oil, LINKER, rice)  
→ [niñieʒ na sabaq] “rice oil”  
/niniʒ/ → [niñieχ]

11) [χ] denotes a voiced velar fricative.

/na:ʃin/	[na:ʃen]	“do not”
/maʃun/	[maʃon]	“tall, long”
/bəʃasəq/	[bʰʃasʰq]	“pimple”
/məʃiʃi/	[məʃeʃeʔ]	“to saw”
/məʃu:ʃun/	[məʃo:ʃon]	“to spread mat”
/tuʃpəs/	[toʃpʰs]	“warm (water)”
/suʃna/	[soʃnaʔ]	“ice, snow”
/puʃtas/	[poʃtas]	“tumor”
/ti:ʃpʰs/	[tʰiæʃpʰs]	“spit”
/baʃtu:suk/	[baʃtu:suk]	“yam”
/maʃmaq/	[maʃmaq]	“hot”

## (3) Nasals

Kbalan has three nasals: /m/, /n/ and /ŋ/.

## (A) Bilabial

/m/ is realized as [m].

/ma:ta/	[ma:taʔ]	“eye”
/maitəmalz/	[maitəmalz]	“head hunting people, Atayal”
/a:mus/	[ʔa:mus]	“(small) persimon”
/ʃumzan/	[ʃomzan]	“sweat”
/la:nəm/	[ʃa:nəm]	“cloud, mist”
	[la:nəm]	
/a:nəm/	[ʔa:nəm]	“heart, mind”

(B) Dental/Alveolar<sup>12)</sup>

The dental/alveolar nasal /n/ is realized as [n]~[ɲ]~[ɳ].<sup>13)</sup> The palatal phone [ɳ] appears before phoneme /i/. Elsewhere the other phones—[n] and [ɲ]—are free variants.

/naŋəy/	[naŋsɣ]	“to swim”
/naŋət/	[naŋstʰ]	“wart”
/pa:nay/	[pʰa:nay]	“rice”
/wanu/	[wanuʔ]	“honey”
/ta:mən/	[ta:mʰn]	“viand, side-dish”
/na:san/	[na:san]	“garden”
/niwmasan/	[ɳiwmasan]	“salted meat”
/niŋu/	[ɳiŋuʔ]	“shade”
/paŋi/	[pʰaŋiʔ]	“bow (for hunting)”

12) See Footnote (4).

13) [ɲ] and [ɳ] denote a dentalized nasal and a palatalized nasal respectively.

## (C) Velar

The phoneme /ŋ/ is realized as velar nasal [ŋ].

/ŋuit/	[ŋuit <sup>o</sup> ]	“snot”
/ŋu:yu/	[ŋo:yoʔ]	“mouth”
/təŋan/	[təŋan]	“to be killed”
/bitŋəs/	[bit <sup>o</sup> ŋəs]	“to overeat oneself”
/unuŋ/	[ʔunuŋ]	“nose”
/lubuŋ/	[lubuŋ]	“skin”
	[řubuŋ]	

## (4) Laterals

The Kbalan laterals are subdivided into two phonemes depending on the degree of friction. They are lateral approximant /l/ and lateral fricative /lz/.

(A) Lateral Approximant<sup>14)</sup>

The lateral approximant /l/ is realized as [l]~[ɭ]~[ř]. The phones [l] and [ř] are free variants and the velarized lateral fricative [ɭ] is found at the end of a word or between two high back vowels.

/lawlaw/	[lawlaw]	“ocean”
	[řawřaw]	
/li:ma/	[li:maʔ]	“five”
	[ři:maʔ]	
/sa:lu/	[sa:luʔ]	“pumpkin”
	[sa:řuʔ]	
/mulu/	[muɭuʔ]	“orange”
/tu:ɬul/	[tu:ɬoɭ]	“back of hand”
/mi:pil/	[mi:piɭ]	“to listen”

(B) Lateral Fricative<sup>15)</sup>

The phoneme /lz/ is realized as [lz]~[d] freely. It is usually accompanied by the friction and the existence of the strong friction makes the difference between the lateral approximant and the lateral fricative. Occasionally full contact is made at the point of articulation and the stop phone [d] often appears.

/lza:lzas/	[lza:lzas]	“betel nut”
	[da:das]	
/lzalzlzə/	[lzalz:ɣʔ]	“pupil of eye”
	[dad:ɣʔ]	
/balzat/	[balzat <sup>o</sup> ]	“east wind”
	[badat <sup>o</sup> ]	

14) See Ladefoged (1975) pp. 54–55, pp. 149–151.

15) See Ladefoged (1975) pp. 149–151.



/alʒam/	[ʔalʒam]	“bird”
/sa:məlz/	[sa:məlz]	“sesami”
/səlzəq/	[səlzəq <sup>o</sup> ]	“penis”
	[sədaq <sup>o</sup> ]	

### (5) Glottal Stop

The glottal stop is not phonemically distinctive in the Kbalan language. It appears regularly before an initial vowel and after a final vowel, though the sound can not be found between two successive vowels in the medial position.

/apuq/	[ʔapoq <sup>o</sup> ]	“lime”
/uʒat/	[ʔuʒat <sup>o</sup> ]	“tendon”
/siti/	[ʃitiʔ]	“oil (liquid)”
/piŋi/	[piŋiʔ]	“cheek”
/ziin/	[ziin]	“sea”
/mais/	[mais]	“corn”

## IV. Long Consonants

In Kbalan many long consonants like /mm/( [m:] ), /nn/( [n:] ), /ss/( [s:] or [ʃ:] ), /tt/( [t:] or [t:] ), /pp/( [p:] ), /kk/( [k:] ), /zz/( [z:] or [z:] ) etc. are observed.<sup>16)</sup> These long consonants are phonemically distinctive, though no exact minimal pair has been found.

/missi/	[miʃ:iʔ]	“to be fat”
/isi/	[ʔiʃiʔ]	“rice wine (in red)”

The examples of the long consonants are as follows:

/missi/	[miʃ:iʔ]	“to be fat”
/sammay/	[sam:ay]	“to cook rice”
/ləppaw/	[lɔp:aw]	“hut”
	[ʃɔp:aw]	
/səssəŋ/	[sɔs:sɔŋ]	“cool”

From the acoustic point of view, Fig 1 shows that the time-duration of the latter syllable is almost 400 m.secs and the period of the long consonant is equal to that of the ordinary ‘CV’ syllable, that is, 200 m.secs.

In most of the words that have long consonants, the consonants are located in medial position. But there are some, chiefly mono-syllables, that have long consonants in initial position:

16) [:] does not always show that the length of the consonant is equal to that of the vowel acoustically, though it might be equal sometimes. It only means that the consonant is rather long.

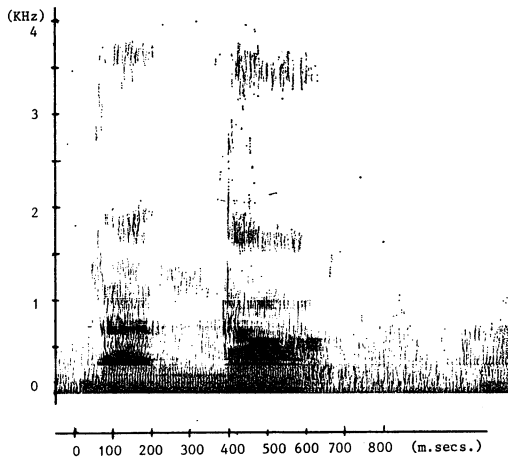


Fig. 1. /lʒalzʒə/ "pupil of the eye"

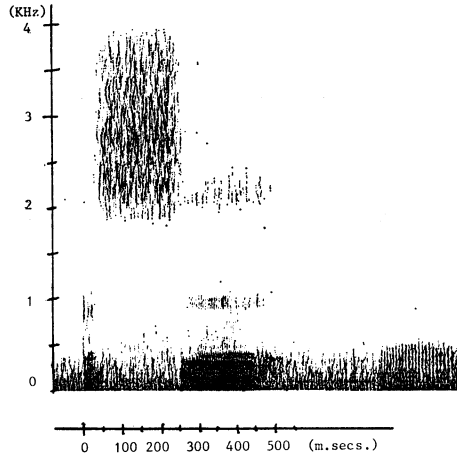


Fig. 2. /əssi/ "meat"

/mmay/	[m:ay]	"rice"
/ssi/	[ʃ:iʔ]	"meat"
/nnsən/	[n:sən]	"bowl"

There are alternative articulation in each instance with /ə/, appearing before the long consonant.

/əmmay/	[ʔɤm:ay]	"rice"
/əssi/	[ʔɤʃ:iʔ]	"meat"
/ənnsən/	[ʔɤn:sən]	"bowl"

In Fig 2 the phoneme /ə/ appears and the length of the vowel is about 50 m.secs. The vast majority of the words that have a long consonant have it after the vowel /ə/. As a result the vowel /ə/ might be regarded as the condition for the appearance of the long consonant. In other words the phoneme /ə/ preceding a consonant causes the consonant long and the vowel sometimes disappears.

Most of the words with a long consonant possess the vowel /ə/. But there are some like these:

/missi/	[miʃ:iʔ]	"to be fat"
/sammay/	[sam:ay]	"to cook rice"
/unnəm/	[ʔun:ɤm]	"six (counting things)"
/issa/	[ʔis:aʔ]	"one (counting things)"

But these words are compounds and composed of an affix and a root word above.

/missi/	←/mi/ + /ssi/
/sammay/	←/sa/ + /mmay/
/unnəm/	←/u/ + /nnəm/

The affixes /mi/, /sa/ and /u/ are affixes for adjectivalization, verbalization and quantification respectively.<sup>17)</sup> This shows that the long consonant still remains after the loss or shortening of the vowel.<sup>18)</sup>

### V. Semi-Vowels

There are two semi-vowels in Kbalan: /w/ and /y/

(a) /w/

/wa:ki/	[wa:kiʔ]	“horn”
/wasu/	[wasoʔ]	“dog”
/uway/	[ʔuway]	“rattan”
/ka:way/	[k <sup>h</sup> a:way]	“backpack”
/bawa/	[bawaʔ]	“ship, boat”
/ba:baw/	[ba:baw]	“high”
/a:paw/	[ʔa:paw]	“cassava”

(b) /y/

/yaw/	[yaw]	“exist, there is”
/kəba:yu/	[kəba:yoʔ]	“horse”
/qa:yaʙ/	[qa:yaʎ]	“abalone”
/patay/	[patay]	“to die”
/lu:zay/	[lu:zay]	“foxtail millet”

### VI. Vowels

There are four vowels in Kbalan; /a/, /i/, /u/ and /ə/.

(a) Low Central Vowel /a/

/a:pun/	[ʔa:pun]	“beast, deer”
/awa/	[ʔawaʔ]	“glass, cup”
/ma:saŋ/	[ma:saŋ]	“before”
/pawsilz/	[pawʃilz]	“to paint”
/ta:nan/	[ta:nan]	“to go home”
/usiwa/	[ʔuʃiwaʔ]	“nine (counting things)”

(b) High Front Vowel /i/

The phoneme /i/ is realized as [i]~[e]~[iæ]~[ie]~[æi]~[ei] according to its environment and the length of the syllable.

☆Ultimate Syllable

(i) Short Syllable

The phoneme /i/ is realized as [e] in a short syllable after the uvular fricative.

## 17) In counting or describing the number Kbalan uses three kinds of numerals:

## (A) No objects, only counting:

/issa/, /lusa/, /tulu/, /spat/, /lima/, (1, 2, 3, 4, 5)

/nnəm/, /pitu/, /wəʒu/, /siwa/ (6, 7, 8, 9)

## (B) Counting human beings:

/paqna: num/, /kinalusa/, /kintulu/, /kinspat/, /kinlima/,

(1, 2, 3, 4, 5)

/kinanəm/, /kimpitu/, /kinwəʒu/, /kinsiwa/

(6, 7, 8, 9)

## (C) Counting objects:

/usiq/, /ulʒusa/, /utulu/, /uspat/, /ulima/

(1, 2, 3, 4, 5)

/unnəm/, /upitu/, /uwəʒu/, /usiwa/

(6, 7, 8, 9)

See Moriguchi (1977c).

## 18) But there are some exceptions that do not have the vowel /ə/ in front of the long consonants synchronically:

/issa/	[ʔis:aʔ]	“one”
/kannan/	[kan:an]	“to be eaten (Locative Focus)”
/matti/	[maʔ:iʔ]	“unripe”
/massim/	[mas:im]	“sour”
/mannət/	[man:ʒt°]	“bitter”

The words above are not compounds except /kannan/ and there is no vowel /ə/ in front of the consonants.

But if the vowel /ə/ is inserted in front of the long consonants, they are reconstructed as follows:

ʔiəs:aʔ  
kaən:  
maəf:i  
maən:ət°

From the historical point of view the reconstructed forms are very similar to the old forms of the words:

*əsa			“one”
*kaən			“to eat”
*hə(n)taq,	*q(ə)taq,	*anət <sub>1</sub> aq <sub>1</sub>	“raw, unripe; acrid”
*qalsem			“sour”
*hə(n)taq,	*q(ə)taq,	*anət <sub>1</sub> aq <sub>1</sub>	

As a result there was a vowel /ə/ in front of the consonants which made the consonants long and it disappeared.

Concerning \*hə(n)taq, \*q(ə)taq and \*anət<sub>1</sub>aq<sub>1</sub> /matti/ and /mannət/ are derived from the same proto form. But Lopez (1974) shows that in the Sambales language ‘anta’ means ‘racidity’ and ‘áta?’ does ‘raw’. In addition to Sambales there is also a difference between ‘mentah’ (‘uncooked, raw’) and ‘muda’ (‘unripe, young, pale (of color)’) in Malay.

As shown in Fig. 1 and 2 the period of the prolonged consonant is very long: 200 m. secs.. If the length of the vowel that supports the consonant is taken into consideration, the total length of the monosyllabic word that has the long consonant becomes 400 m. secs., which is almost equal to that of the two syllable word. This means the lengthening is a compensation for the loss of the vowel /ə/, in other words, a compensation for the fundamental syllabilification in Kbalan because of the syllable-timedness. And the vowel /ə/ in front of the long consonant becomes short—50 m. secs.. and is sometimes weakened and disappears.

/waʔi/	[waʔeʔ]	‘east’
/ʔiʔi/	[ʔeʔeʔ]	‘saw (tool)’
/biʔi/	[ʔiʔeʔ]	‘leaf’
/awʔi/	[ʔawʔeʔ]	‘to go over there’
/ba:qi/	[ba:qeʔ]	‘grand father’
/ʔiʔip/	[ʔeʔep°]	‘shrike’
/sənawaqit/	[sənawaqet°]	‘dried meat’ <sup>19)</sup>

The phoneme /i/ is realized as [e] in a short syllable before the uvular fricative or stop.

/saʔiq/	[saʔeq°]	‘bolo’
/pəziq/	[pəʔeq°]	‘head flat at the back’
/tu:liq/	[tu:leq°]	‘hornet’
/piyaqiq/	[piyaqeq°]	‘vagina’
/qaimuʔiʔ/	[qaimoʔeχ]	‘insane’

(ii) Long Syllable,

The phoneme /i/ is realized as [ie] or [iæ] before the uvular fricative or stop, though the lengthening is not phonemically distinctive.

/ʔibiʔ/	[ʔiβiæχ]	‘lips’
/niniʔ/	[niñiæχ]	‘sieve’
/bətiq/	[bəʔiæq°]	‘spring snare’
/mimisiʔ/	[mimfiæχ]	‘scatter’ <sup>20)</sup>

☆Penultimate Syllable

(i) Short Syllable

The phoneme /i/ is realized as [i].

/tiʔuʔ/	[tiʔoχ]	‘egg’
/iʔuʔ/	[ʔiʔoχ]	‘river’
/inaʔ/	[ʔinaχ]	‘to wake up’
/iʔaʔ/	[ʔiʔaχ]	‘fence made of bamboo’
/impis/	[ʔimpis]	‘thin (as to paper etc.)’

(ii) Long Syllable

The phoneme /i:/ is realized as [i:] before or after any phoneme other than the uvular fricative or stop.

/i:nat/	[ʔi:nat°]	‘comb’
/i:mis/	[ʔi:mis]	‘north’

19) This is discussed in VII in this paper. The ultimate syllable ending in [q°] or [ʔ] or [t°] or [p°] tends to become shorter.

20) The ultimate syllable that ends in a voiceless uvular fricative [χ] is sometimes pronounced rather long, though there are some exceptions like /qaimuʔiʔ/ (= [qaimoʔeχ]).

/i:bu/	[ʔi:βuʔ]	“ash”
/i:palz/	[ʔi:palz]	“bamboo raft”
/i:nəb/	[ʔi:nəb°]	“door”

The phoneme /i:/ is realized as [ei] or [æi] after the uvular fricative or stop.

/βi:nəŋ/	[βeinaŋ]	“blood”
	[βæinaŋ]	
/βi:kan/	[βeikan]	“sole of the foot”
	[βæikan]	

The phoneme /i/ is realized as [ie] or [iæ] before a uvular fricative or stop.

/ti:βpəs/	[tiæβpəs]	“spit”
/li:qulz/	[liæqod°]	“tail”
	[liæqolz]	
	[ʔiæqolz]	
	[ʔiæqod°]	

(c) High Back Vowel /u/

The phoneme /u/ is realized as [u]~[o]. Though the distribution of the phones is not sure, there is some tendency in its alternations; the phoneme /u/ tends to be realized as [o] before or after a uvular fricative or stop, or in the ultimate syllable.

/lunuq/	[lunoq°]	“nape”
	[ʔrunoq°]	
/luqu/	[loqoʔ]	“hat”
	[ʔoqoʔ]	
/βuaβu/	[βoaβoʔ]	“broth”
/bi:suβ/	[bi:sox]	“satisfied (eating)”
/βunanay/	[βonanay]	“male”
/βutuŋ/	[βotuŋ]	“monkey”
/su:nis/	[su:nis]	“child, baby”

(d) Central Vowel /ə/

The phoneme /ə/ is realized as [ə] or [ɜ], which are free variants. The phone [ɜ] is pronounced with lips tightly spread, but in some environment the feature—pronounced with lips spread—is lost, and the phoneme /ə/ is realized as a central vowel [ə].

/ətəβ/	[ʔɜtaβ]	“gum (tobacco’s)”
/səssəŋ/	[sɜs:ɜŋ]	“cool”
/kənnaw/	[kɜn:aw]	“onion”
/tu:səq/	[tu:sɜq°]	“marrow”
/səppəl/	[səp:ɜʔ]	“soft”

## (e) Two Successive Vowels

As shown before there is no glottal stop between two successive vowels, and the types of the combination of the two successive vowels are nine.

/aa/	/taalz/	[taálz]	“excrement”
/ai/	/tumaita/	[tumaitaʔ]	“to see”
/au/	/qaupiyaβ/	[qaupiyax]	“sweet potato”
/ii/	/ziin/	[ziín]	“sea”
/iu/	/siulatan/	[fiulatan]	“assembly hall”
/ia/	/siaqay/	[fiaqay]	“snake”
/ua/	/qausua/	[qausuaʔ]	“umbrella” <sup>21)</sup>
/ui/	/kuit/	[kuítʔ]	“ghost”
/uu/	/kuun/	[kuún]	“trousers”

Concerning the long vowels /a:/, /i:/ and /u:/ a hypothesis that the vowels are phonemicized as two successive vowels might be proposed. But as shown above and in Moriguchi (1982), the stress, which is not distinctive and automatically assigned to the ultimate syllable, falls on the latter part of the vowels in the succession, when there are two successive vowels in final syllable. As a result there must be a vowel succession in addition to the short vowel and the long vowel:

SHORT	LONG	TWO-SUCCESSIVE
/i/—[i]	/i:/—[i:] [ie]	/ii/—[ií]
/a/—[a]	/a:/—[a:]	/aa/—[aá]
/u/—[u] [o]	/u:/—[u:] [o:]	/uu/—[uú]

## VII. Accent

As shown in Moriguchi (1982), the accent in Kbalan is the length, which is indicated by the shortness of the penultimate syllable. Two of the other prominences, that is, pitch and stress are not distinctive phonemically. The stress/amplitude automatically falls on the ultimate syllable, and the pitch optionally characterizes the length. Only the length of the penultimate syllable is distinctive and the length of the ultimate syllable does not affect the meaning. The length of the ultimate syllable is determined by the consonant at the end of the syllable, that is, the stops /t/, /k/, glottal stop etc. make the syllable rather short, but the fricatives like /β/(=[χ]), /s/ etc. make it rather long.

The length of the penultimate syllable is indicated by the colon (:), if it is long.

## LONG

/bu:qas/	“hair”
/pu:qaw/	“blind”

21) This is discussed in Moriguchi (1982).

/lʒa:lʒas/	“betel nut”
/ʒu:si/	“tears”
/ti:muʒ/	“south wind”
/i:palʒ/	“bamboo raft”
/pu:taw/	“strong wind; ax”
/pi:lay/	“lame”
/ta:nəm/	“tomb”
/pa:nay/	“dry-land rice”
/i:nəb/	“door”
/ʒa:malʒ/	“fire”
/i:sam/	“reed”
/pu:nulʒ/	“anus”
/lu:luŋ/	“nape”
/si:ku/	“elbow”
/bu:səʒ/	“navel”
/i:zip/	“body”
/qu:dus/	“clothing”
/si:yəʒ/	“ware house”
/ka:was/	“basket”

## SHORT

/tiʒuʒ/	“egg”
/apuq/	“lime”
/uban/	“grey hair”
/qalʒəlʒ/	“to sit”
/bilʒan/	“to count”
/uzan/	“rain”
/bulan/	“moon”
/nuzu/	“coconut”
/siti/	“oil”
/naŋi/	“good”
/bila/	“piper betel”
/niŋu/	“shadow”
/silʒi/	“pepper”
/lubuŋ/	“skin”
/bali/	“wind”
/bəʒas/	“rice”
/bilu/	“charcoal”
/lasu/	“bullet, lead (metal)”
/lilʒam/	“tongue”
/sabaq/	“unhusked rice”
/tuqu/	“spiral shell in the sea, snail”
/bunina/	“banana”



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