

# **PHONOLOGICAL SKETCH OF BANGOLAN**

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**BASAL volunteer, BANGOLAN language**

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## Abbreviations

ADJ	Adjective
EX	Exclamation
F1	Future (certain)
F2	Future
HAB	Habitual
IMP	Imperative
N	Noun
NEG	Negation
NP	Noun Phrase
P	Past Tense
G	Glide
C	Consonant
V	Vowel
P1	Recent Past
P2	Far Past
PROG	Progressive
REL	Relative Clause
1S	First Person Singular
2S	Second Person Singular
3S	Third Person Singular
1P	First Person Plural
2P	Second Person Plural
3P	Third Person Plural

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## 1 Introduction

This work presents a sketch of the phonology of Bangolan, a Grassfields Bantu language spoken near the eastern border of the Ngoke-tunjia Division of the Northwest Province, Republic of Cameroon. The Bangolan language has no significant differences in pronunciation or vocabulary within what is known as Bangolan village (the main area where it is spoken) and therefore no difficulties in inter-comprehension. This language can therefore be described as being completely homogenous. As far as the author knows, no previous research has been done on the Bangolan language.

### 1.1 Location and Classification

Bangolan is a language spoken near the eastern border of Ngoke-tunjia Division of the Northwest province of Cameroon. Bangolan is classified as Shu Pamem (901) in ALCAM (Dieu and Renaud, 1983:121) along with Bamoum, Bapi, Bamali, Bafanji, and Bambalan. It is further classified in the Ethnologue (Grimes, 2000:31) as Niger-Congo, Atlantic–Congo, Volta-Congo, Benue-Congo, Bantoid, Southern, Wide Grassfields, Narrow Grassfields, Mbam-Nkam, Nun. According to SIL sources quoted in Margaret A Graffin (1994), the population of Bangolan was 6,300 at the time of the 1987 census. If you multiply the 1987 population times a typical 2.9% yearly increase, you might guess that the population in 2003 is likely to be around 10,000.

## 2 Consonants

### 2.1 Consonant Phones

It is worth mentioning that certain complex consonants found in Bangolan might appear to some researchers to be consonant clusters. If one sees these complex consonants as consonant clusters, he must realize that there are severe restrictions on which consonants can occur next to each other, namely: NC, CG and NCG (where N would stand for homorganic nasal consonants and G would stand for either of the two semivowel glides). The following chart shows all the complex consonants found in Bangolan (see section 5 below for a consonant cluster alternative analysis):

	Bilabial	Labio-dental	Alveolar	Post-alveolar	Palatal	Velar	Labial-velar	Glottal
Plain voiceless stops	p pw pj		t tw tj			k kw kj	kp	ʔ
Plain vd. stops							gb	
Vl. asp. stops			th					
Prenasalized voiceless stops			nt ntw ntj			ŋk ŋkw ŋkj	ŋmkp	
Prenasalized voiced stops	mb mbw mbj		nd ndw ndj			ŋg ŋgw ŋgj	ŋmgb	
Plain voiceless affricates			ts	tʃ tʃw				
Prenasalized vl. affricates			nts	ntʃ ntʃw				
Prenasalized vd. affricates			ndz	ndʒ ndʒw				
Plain voiceless fricatives		f fw fj	s	ʃ ʃw				h
Plain voiced fricatives		v vw	z	ʒ ʒw		ɣ		
Prenasalized vl. fricatives		ɱf ɱfw						
Prenasalized vd. fricatives		ɱv ɱvw						
Nasals	m mw mj		n		ɲ ɲw	ŋ ŋw		
Liquids			l lw lj					
Rhotics			r					
Semivowels	w				j			

Gaining inspiration from others works on Grassfield Languages, notably Haynes (1984) for Yemba, Anderson (1977) for Ngiemboon, and Satre (1997) for Ngomba, we have chosen to analyze certain consonant modifications (labialization, palatalization and prenasalization) as resulting from underlying prosodies, for reasons of economy and elegance. Without such an analysis, one might prefer an analysis that treated these consonant modifications as separate consonants in their own right (see section 4.3 below for such an alternated analysis).

## 2.2 Labialized Consonants (C<sup>w</sup>)

Labialized consonants found in the data: pw, mbw, mw, fw, vw, ɱfw, ɱvw, tw, ntw, ndw, lw, tʃw, ntʃw, ndʒw, ʃw, ʒw, ɲw, kw, ŋkw, ŋgw, ŋw

Chart of labialized consonants occurring before vowels:

C↓ / V →	i	e	ɛ	ə	ɪ	α	u	o	ɔ	←V / C↓	Totals
pw		8	4	1		3				pw	16
mbw		3	1	6		1				mbw	11
mw				1		2				mw	3
fw		2	3			3			3	fw	11
vw						2		13	7	vw	22
ɱfw									4	ɱfw	4
ɱvw						1				ɱvw	1
tw	14	6	3						1	tw	24
ntw	1		1							ntw	2
ndw	26	7	2	2						ndw	37
lw	1	4							1	lw	6
tʃw	7	1	5			1			2	tʃw	16
ntʃw	1		1							ntʃw	2
ndʒw			4							ndʒw	4
ʃw	16		6							ʃw	22
ʒw	7	3	9							ʒw	19
ɲw	9	1	3							ɲw	13
kw	4		2			6				kw	12
ŋkw		1				11				ŋkw	12
ŋgw						4			1	ŋgw	5
ŋw						4	3			ŋw	7
C↑ / V →	i	e	ɛ	ə	ɪ	α	u	o	ɔ	V← / C↑	
Totals	86	36	44	10	0	38	3	13	19		249

The preceding chart shows that most kinds of consonants can be labialized. Significant exceptions are the labio-velar double stops, the alveolar grooved affricates and the alveolar nasal. Some of these restrictions will become important further below. It is also important to note from the preceding chart that no labialized consonant occurs before [i], though they do occur before all the other vowels.

## 2.3 Palatalized Consonants (C<sup>J</sup>)

Palatalized consonants found in the data: pj, mbj, mj, fj, tj, ntj, ndj, lj, kj, ŋkj, ŋgj

Palatalized consonants occurring before vowels:

C↓ / V →	i	e	ɛ	ə	ɨ	ɑ	u	o	ɔ	V← / C↓	Totals
pj	3		6			1				pj	10
mbj	1									mbj	1
mj			2							mj	2
fj	3									fj	3
tj		1	1			3				tj	5
ntj						2				ntj	2
ndj			1			1				ndj	2
lj			1			2				lj	3
kj	3	2	25			3				kj	33
ŋkj	19		8			6				ŋkj	33
ŋgj	3	2	6			17				ŋgj	28
C↑ / V →	i	e	ɛ	ə	ɨ	ɑ	u	o	ɔ	V← / C↑	
Totals:	32	5	50	0	0	35	0	0	0		123

The above table shows that palatalized consonants have a much more restricted distribution than labialized consonants. First off, though labialized consonants have very few restrictions on which vowels can follow, palatalized consonants only occur before front vowels and [a], never before back vowels, rounded vowels or central vowels other than [a]. One of the possible implications of the restriction against occurring with central vowels will be discussed in section 3.2 below.

The above table also shows that the number of consonants that occur with palatalization is much less than with labialization. In addition to the labio-velar double stops, all of the coronal fricatives and affricates never occur with palatal offglides. The reason behind this coronal restriction is that the plain alveolar fricatives/affricates [s, z, ts, dz] become alveopalatal fricative/affricates [ʃ, ʒ, tʃ, dʒ] when palatalized and [ʃw, ʒw, tʃw, dʒw] when labialized (see section 2.5.4 below). As with labialization, we are treating palatalization as a root-level prosody that primarily affects root-initial consonants.

## 2.4 Prenasalised Consonants (<sup>N</sup>C)

Prenasalized consonants found in the data: ndz mbw nd ɲg ndw ɲdʒw ntʷ  
 nt ɲfw mb mbj ɲmgb ɲkj ɲdʒ ntj ɲmkp ɲgj ntʃ ɲk  
 ɲkw ɲf nts ɲgw ntʃw ɲv ɲvw

All prenasalized consonants in the data (regardless of labialization or palatalization):

C2↓ / C1 →	m	ɲ	n	ɲ	ɲ	ɲm	← C1 / C2↓	Totals
b	33						b	33
f		10					f	10
v		8					v	8
t			10				t	10
d			42				d	42
ts			4				ts	4
dz			8				dz	8
tʃ				3			tʃ	3
dʒ				5			dʒ	5
k					5		k	5
g					16		g	16
kp						6	kp	6
gb						14	gb	14
C2↑ / C1 →	m	ɲ	n	ɲ	ɲ	ɲm	← C1 / C2↑	
Totals:	33	18	64	8	21	20		164

In examining the above chart, it is interesting that while voiced plosives [b, d, g] can (indeed, must) be prenasalized, only [t, k] of the parallel voiceless plosives are found prenasalized. This is taken as an indication of the fact that [p, b] work together as members of the same phoneme in a way that [t, d] and [k, g] do not. This restricted distribution is tied to our conclusion that there is a hole in the phoneme chart at precisely the /p/ position.

The most general restriction in the preceding chart is that prenasalization always occurs at the same point of articulation as the following consonant. This modification, therefore, is meant to provide a completely homorganic prenasal onglide to the consonants so modified. Even the labio-velar double stops receive a completely homorganic double nasal onglide.

In addition, it should be noticed that the fricatives [s, z, ʃ, ʒ] become affricated to their respective counterparts [ts, dz, tʃ, dʒ] after the nasal onglide, as described in section 2.5.2 below.



## 2.5 Consonant Allophones

Once we subtract the effects of labialisation, palatalization and prenasalization from our initial consonant phone chart, we are still left with the following "simple" consonant phones:

### Simple Consonant Phone Chart

	<b>Bilabial</b>	<b>Labio-dental</b>	<b>Alveolar</b>	<b>Alveo-palatal</b>	<b>Palatal</b>	<b>Velars</b>	<b>Glottals</b>	<b>Labio-velars</b>
<b>Plosive</b>	p b		t d			k g	ʔ	kp gb
<b>Asp. Plosive</b>			th					
<b>Fricatives</b>		f v	s z	ʃ ʒ	ɣ		h	
<b>Affricates</b>			ts dz	tʃ dʒ				
<b>Nasals</b>	m		n			ŋ		
<b>Flap</b>			ɾ					
<b>Laterals</b>			l					
<b>Approximants</b>					j			w

Bangolan has five allophonic rules that change one allophone to another in specific phonological environments. These are described in detail below.

### 2.5.1 Aspirated Consonant Allophones

In Bangolan, the only consonant to become aspirated is /t/ which becomes [t<sup>h</sup>] only before a syllable-final [u] in an open syllable that has none of the three prosodies. This is a highly restrictive environment for a unique modification. See the chart in section 2.5.6 below for examples.

### 2.5.2 Prenasalised Consonant Allophones

In Bangolan, the simple consonant phones [p, l, ɣ, z, ʒ] occur only in non-prenasalized syllables while their respective counterparts [b, d, g, dz, dʒ] occur only in prenasalised syllables. See the chart in section 2.5.6 below for examples.

### 2.5.3 Lateral Flap Allophones

The consonant phone [l] varies freely with [ɾ] only following syllable-final consonants or between vowels inside a root. See the chart in section 2.5.6 below for examples.

## 2.5.4 Alveopalatal Allophones

The simple allophones [s, z, ts, dz] found in regular syllables alternate with their respective counterparts [ʃ, ʒ, tʃ, dʒ] in palatalised syllables and [ʃw, ʒw, tʃw, dʒw] in labialised syllables. See the chart in section 2.5.6 below for examples.

## 2.5.5 Glottal Stop as an allophone of /k/

The glottal stop phone [ʔ] occurs only in syllable-final position or between vowels inside a root, whereas [k] never does. See the chart in section 2.5.6 below for examples.

## 2.5.6 Consonant Allophone Summary Chart

Phoneme	Allophone	Initial position	Medial position	Final position
/b/	[p]	<b>[pà]</b> <i>bag</i>	<b>[pàpôŋ]</b> <i>beautiful</i>	—
	[b] <sup>1</sup>	—	<b>[mbé]</b> <i>nail</i>	—
/d/	[d] <sup>1</sup>	—	<b>[ndóŋ]</b> <i>horn</i>	—
	[l]	<b>[lòŋ]</b> <i>chair</i>	—	—
	[l] ~ [ɾ] <sup>2</sup>	—	<b>[túŋlò]~ [túŋrò]</b> <i>ear</i>	—
/g/	[g] <sup>1</sup>	—	<b>[ŋgùt]</b> <i>skin</i>	—
	[ɣ]	<b>[ɣàtò]</b> <i>divide</i>	<b>[kàɣàŋ]</b> <i>okra</i>	—
/gb/	[gb]	<b>[gbó]</b> <i>laugh</i>	<b>[màŋgbé]</b> <i>girl</i>	—
/kp/	[kp]	<b>[kpàt]</b> <i>leg</i>	<b>[tékpàt]</b> <i>shoe</i>	—
/t/	[t]	<b>[túŋ]</b> <i>dig (v)</i>	<b>[ntô]</b> <i>cricket</i>	<b>[sót]</b> <i>hoe</i>
	[tʰ] <sup>3</sup>	<b>[tʰú]</b> <i>send (v)</i>	<b>[ntʰúhú]</b> <i>six</i>	—
/k/	[k]	<b>[kú]</b> <i>die (v)</i>	<b>[ŋkji]</b> <i>water</i>	—
	[ʔ] <sup>4</sup>	—	<b>[tèʔé]</b> <i>find</i>	<b>[nàʔ]</b> <i>cow</i>
/v/	[v]	<b>[vù]</b> <i>ash</i>	<b>[ŋvwát]</b> <i>circumcision</i>	—

/z/	[z]	<b>[zí]</b> <i>face</i>	<b>[múzèŋ]</b> <i>rib</i>	—
	[dz] <sup>1</sup>	—	<b>[ndzà]</b> <i>dream</i>	—
	[ʒ] <sup>5</sup>	<b>[ʒí]</b> <i>know (v)</i>	<b>[wǎʒwí]</b> <i>lion</i>	—
	[dʒ] <sup>1, 5</sup>	—	<b>[ndʒìŋ]</b> <i>darkness</i>	—
/f/	[f]	<b>[fù]</b> <i>leaf</i>	<b>[méfé]</b> <i>squirrel</i>	—
/s/	[s]	<b>[sáŋ]</b> <i>corn</i>	<b>[sósât]</b> <i>sugarcane</i>	—
	[ʃ] <sup>5</sup>	<b>[ʃíʃí]</b> <i>vein</i>	<b>[móʃíŋ]</b> <i>bird</i>	—
/h/	[h]	<b>[hé]</b> <i>give (v)</i>	<b>[míhí]</b> <i>eyes</i>	—
/ts/	[ts]	<b>[tsòt]</b> <i>mouth</i>	<b>[ntsò]</b> <i>war</i>	—
	[tʃ] <sup>5</sup>	<b>[tʃí]</b> <i>blood</i>	<b>[móʃwó]</b> <i>eagle</i>	—
/m/	[m]	<b>[mónà]</b> <i>animal (v)</i>	<b>[lèmú]</b> <i>orange</i>	—
/n/	[n]	<b>[nó]</b> <i>snake</i>	<b>[nùnúŋ]</b> <i>bee</i>	—
/ŋ/	[ŋ]	<b>[ŋá]</b> <i>spider</i>	<b>[sòŋnó]</b> <i>speak (v)</i>	<b>[kàŋ]</b> <i>chest</i>
/w/	[w]	<b>[wú]</b> <i>fall (v)</i>	<b>[mówò]</b> <i>hawk</i>	—
/j/	[j]	<b>[jí]</b> <i>read</i>	<b>[mójèlè]</b> <i>leaf</i>	—

Notes:

<sup>1</sup> Consonant phones [b, d, g, dz, dʒ] occur only after nasal consonants while alternate consonant phones [p, l, ɣ, z, ʒ] occur in other positions.

<sup>2</sup> The consonant phone [l] varies freely with [r] only following syllable-final consonants or between vowels inside a root.

<sup>3</sup> The aspirated consonant phone [t<sup>h</sup>] occurs only before [u] in open syllables.

<sup>4</sup> The glottal stop phone [ʔ] occurs only in syllable-final position or between vowels inside a root.

<sup>5</sup> Consonant phones [ʃ, ʒ, tʃ, dʒ] occur only in syllables that are palatalized or labialised while alternate consonant phones [s, z, ts, dz] occur only in syllables without palatalization or labialization.

## 2.6 Consonant Phoneme Chart

Once the modifications of labialisation, palatalization, prenasalization and the above five rules for allophones have all been taken into account, one is left with the following 18 consonant phonemes:

### Consonants phonemes

	Labials	Coronal	Back	Labio-Velars
<b>Plosives</b>	b	t d	k g	kp gb
<b>Fricatives</b>	f v	s z	h	
<b>Affricates</b>		ts		
<b>Nasals</b>	m	n	ŋ	
<b>Approximants</b>		j		w

Note: The consonant phoneme set /b, d, g/, that follows an analysis similar to Hyman for Fe'efe'e and Anderson for Ngiemboon has been reanalyzed as being /p, l, ɣ/ by Bird for Yemba and Satre for Ngomba. We have opted for the natural class of underlying voiced plosives which would be left with just the labio-velar double stop if /b, d, g/ were subtracted. While one can argue for the other solution as having more reasonable assimilation rules, the presence of a labio-velar double stop in Bangolan and the desire for underlying natural classes has tilted us towards the solution shown in the table above.

## 3 Vowels

### 3.1 Oral Vowel Phones

Nine oral vowel phones were found in our data, as displayed in the following phonetic chart:

		Front		Central		Back	
high	+ATR	i		ɨ			u
	-ATR						
mid	+ATR	e		ə			o
	-ATR	ɛ					ɔ
low	+ATR						
	-ATR			a			

Bangolan does not have contrastive long vowels, contrastive nasal vowels or vowel-vowel sequences, so the vowel inventory is relatively straightforward.

### 3.2 Vowels and Semivowels: an Alternate Analysis

We have chosen to analyze Bangolan as having nine vowels instead of the normal seven-vowel systems common in Grassfields Bantu languages. There is an alternate analysis, however, when one considers the kinds of syllables in which each of these vowels can be found. The following table shows each of the vowels and whether or not it occurs with labialisation and palatalisation:

Phoneme	With no labialisation or palatalisation	With labialisation	With palatalisation
/i/	<b>[kí]</b> <i>salt</i>	<b>[kwí]</b> <i>forbid</i>	<b>[ɲkjì]</b> <i>water</i>
/e/	<b>[pé]</b> <i>corn fufu</i>	<b>[twé]</b> <i>spit</i>	<b>[tyé]</b> <i>market</i>
/ɛ/	<b>[két]</b> <i>arrow</i>	<b>[kwét]</b> <i>heap(dirt)</i>	<b>[kyét]</b> <i>take</i>
/ĩ/	<b>[kít]</b> <i>harvest(corn)</i>	—	—
/ə/	<b>[pó]</b> <i>NEG.</i>	<b>[mbwə]</b> <i>body</i>	—
/a/	<b>[kaŋ]</b> <i>chest</i>	<b>[kwàŋ]</b> <i>bury</i>	<b>[kjáŋ]</b> <i>fry</i>
/u/	<b>[kú]</b> <i>die</i>	<b>[kwú]</b> <i>touch</i>	—
/o/	<b>[fó]</b> <i>eight</i>	<b>[vwó]</b> <i>ten</i>	—
/ɔ/	<b>[pó]</b> <i>hands</i>	<b>[vwə]</b> <i>stomach</i>	—

As the reader will notice in the preceding chart, all the vowels occur in syllables that have neither labialisation nor palatalisation, all except [ĩ] occur with labialisation, but only [i, e, ɛ, a] occur with palatalisation. The prevalence of symmetrical seven-vowel systems in Grassfields Bantu languages, together with these restrictions on the two unusual central vowels leads one to consider various other hypotheses. The most straightforward alternate solution seems to be to posit seven underlying vowels and rules that change back vowels \u, o\ into centralized and unrounded vowel phones [ĩ, ə] when they are palatalized (or when they are palatalized *or labialized* for [ə]). Though this kind of seven-underlying-vowel solution is definitely possible with the Bangolan data and it even helps explain Bangolan's relationship to other Grassfields Bantu vowel systems, we have decided not to adopt it here in favor of a less abstract, more phonetic solution, one that is closer to the orthographic decisions that have been made for the language.

### 3.3 Vowel Nasalisation

Nasalized vowels are predictable in Bangolan, they only occur before syllable-final /ŋ/. This predictable nasalization is shown in the following chart (vowel nasalization is shown by a tilde under the vowel in order to reserve the space above the vowel for the tone diacritic).

Phoneme	With oral vowels	With nasal vowels
/i/	[tí] <i>run</i>	[tĩŋ] <i>strong</i>
/e/	[pé] <i>corn fufu</i>	—
/ɛ/	[mbè] <i>liver</i>	[mbèŋ] <i>nuts</i>
/ɪ/	[kít] <i>harvest(corn)</i>	—
/ə/	[pó] <i>NEG.</i>	[mbəŋ] <i>rain</i>
/a/	[kā] <i>crab</i>	[kəŋ] <i>chest</i>
/u/	[lú] <i>full</i>	[lũŋ] <i>smell</i>
/o/	[fó] <i>eight</i>	—
/ɔ/	[pó] <i>hands</i>	[pɔŋ] <i>find</i>

As seen in the above chart, all the vowels except /e, o, i/ occur in closed syllables before the nasal consonant /ŋ/ and the vowel is always nasalised in these contexts.

### 3.4 Vowel Phoneme Chart

Since vowel nasalization is predictable in Bangolan, we are left with the nine oral vowels as our underlying vowel phonemes, as in the following chart.

	Front	Central	Back
Close	ɪ	ɪ	u
Close-mid	e		o
Open-mid	ɛ	ə	ɔ
Open		a	

## 4 Segmental Syllable Structure

### 4.1 Basic Syllable Types

The following combinations of unmodified consonants and vowels are found in Bangolan syllables.

1)	V	[à]	<i>he/she</i>
2)	CV	[tá]	<i>come</i>
3)	CVC	[pèʔ]	<i>mushroom</i>

Of these three, only the last two are really "basic" as the first one has only one example, the one cited above.

### 4.2 Derived Syllable Types

If one builds upon these *basic* types by factoring in the consonant modifications caused by labialisation, palatalization and prenasalization, one can add the following *derived* syllable types (where superscripts <sup>W</sup>, <sup>Y</sup> and <sup>N</sup> stand for the three underlying prosodies).

4)	<sup>W</sup> CV	[pwé]	<i>breast</i>
5)	<sup>W</sup> CVC	[kwít]	<i>forbid</i>
6)	<sup>Y</sup> CV	[pjì]	<i>kolanut</i>
7)	<sup>Y</sup> CVC	[kjét]	<i>take</i>
8)	<sup>N</sup> CV	[ndù]	<i>husband</i>
9)	<sup>N</sup> CVC	[ndóŋ]	<i>cup</i>
10)	<sup>NW</sup> CV	[ndwí]	<i>cloth</i>
11)	<sup>NW</sup> CVC	[ndwèt]	<i>beard</i>
12)	<sup>NY</sup> CV	[ŋkjì]	<i>water</i>
13)	<sup>NY</sup> CVC	[ndjàŋ]	<i>granary</i>

### 4.3 Alternate Analysis with Consonant Clusters

Alternately, one could analyze the syllable types based on consonant clusters. If we went this way (which we are not), we would have the following types (where "N" stands for a homorganic *nasal* consonant and "G" for either of the two semivowel *glides*):

1)	V	[à]	<i>he/she</i>
2)	CV	[tá]	<i>come</i>
3)	CVC	[pèʔ]	<i>mushroom</i>
4)	CGV	[pwé]	<i>breast</i>
5)	CGVC	[kjét]	<i>take</i>
6)	NCV	[ndù]	<i>husband</i>
7)	NCVC	[ndóŋ]	<i>cup</i>
8)	NCGV	[ndwí]	<i>cloth</i>
9)	NCGVC	[ndjàŋ]	<i>granary</i>

It should be noted that, like English, Bangolan consonant clusters would have severe restrictions on which consonants can appear in which positions. These restrictions could be symbolized with the following formula:

$$\text{Syllable} \longrightarrow (\text{N}) (\text{C}_1) (\text{G}) \text{V} (\text{C}_2)$$

This formula says that syllables have an obligatory vowel in Bangolan, preceded by an optional nasal consonant, an optional consonant of any type and an optional semivowel glide and followed by an optional syllable-final consonant (also severely restricted to [ʔ, t, ŋ] consonants).

#### 4.4 Distribution of Syllable Types in Words

Like most Grassfields Bantu languages, the kinds of syllables are severely restricted according to their grammatical status. The restrictions in Bangolan are summarized below:

- 1) V syllables limited to one third person singular pronoun.
- 2) Affixes limited to CV syllables.
- 3) Functors (words other than nouns or verbs) limited to CV syllables.
- 4) CVC syllables limited to roots of nouns or verbs.
- 5) All derived syllable types (containing prenasalization, labialization and palatalization) limited to the first syllable of roots of nouns or verbs.

### 5 Tone

We have identified five basic phonetic pitches on single syllables in Bangolan: three level tones, high [ à ], mid [ ā ], and low [ ̀ ]; and three contour tones, low-high rising [ ǎ ], high-low falling [ â ] and low-falling [ ͂ ].

#### 5.1 Lexical Tone

It is fairly easy to find Bangolan words where the only difference between them is their pitch. For example:

[mbí]	<i>‘outside’</i>	[póʔ]	<i>‘small depression’</i>
[mbì]	<i>‘cockroach’</i>	[pòʔ]	<i>‘mushroom’</i>
[kpát]	<i>‘paint’</i>	[ndón]	<i>‘horse’</i>
[kpàt]	<i>‘foot/leg’</i>	[ndòn]	<i>‘bamboo’</i>
[mā]	<i>‘child’</i>		
[mà]	<i>‘me’</i>		



[ndé]	<i>‘rock’</i>	[kú]	<i>‘die’ (v)</i>
[ndě]	<i>‘no (NEG)’</i>	[kũ]	<i>‘touch’ (v)</i>
[mkpí]	<i>‘firewood’</i>	[ntó]	<i>‘trap fish’ (v)</i>
[mkpî]	<i>‘lake’</i>	[ntô]	<i>‘be defeated’ (v)</i>
[mbê]	<i>‘abscess’</i>	[ndzôŋ]	<i>‘clitoris’</i>
[mbè]	<i>‘liver’</i>	[ndzòŋ]	<i>‘thorn’</i>
[fwǎ]	<i>‘bump’ (v)</i>		
[fwò]	<i>‘be dim’ (v)</i>		
[ŋkǎŋ]	<i>‘plaintain’</i>	[kǎŋ]	<i>‘admire’ (v)</i>
[ŋkòŋ]	<i>‘pestle’</i>	[kòŋ]	<i>‘lance’</i>
[mó]	<i>‘belongings’</i>	[wú]	<i>‘death’</i>
[mǎ]	<i>‘feel active’ (v)</i>	[wũ]	<i>‘fail’ (v)</i>
[mò]	<i>‘one’</i>	[wù]	<i>‘you’ (sg.)</i>
[kpát]	<i>‘catch fish’ (v)</i>	[ká]	<i>‘squeeze’ (v)</i>
[kpát]	<i>‘paint’ (n)</i>	[ká]	<i>‘crab’ (n)</i>
[kpǎt]	<i>‘paint’ (v)</i>	[kǎ]	<i>‘lack’ (v)</i>
[kpàt]	<i>‘foot/leg’</i>	[kà]	<i>‘rust’ (n)</i>
[sé]	<i>‘elephant’</i>	[ndzá]	<i>‘fishing net’</i>
[sē]	<i>‘hatch’ (v)</i>	[ndzā]	<i>‘axe’</i>
[ndú]	<i>‘husband’</i>	[twé]	<i>‘metal’</i>
[ndù]	<i>‘on top of’</i>	[twê]	<i>‘carry on head’ (v)</i>
[ndù]	<i>‘honey’</i>	[twě]	<i>‘grow (plants)’ (v)</i>
[ŋgòʔ]	<i>‘stone’</i>	[nwí]	<i>‘cutlass’</i>
[ŋgóʔ]	<i>‘termite’</i>	[nwĩ]	<i>‘God’</i>
[ɛ̀kj̩ɛ̀]	<i>‘song’</i>	[póʔ]	<i>‘small depression’</i>
[ɛ̀kj̩ɛ̀]	<i>‘water’</i>	[pòʔ]	<i>‘mushroom’</i>

The chart below summarizes the various pitch contrasts in Bangolan.

	H	M	L	LH	HL	LF
H						
M	x					
L	x					
LH	x		x			
HL	x		x	x		
LF	x	x	x	x	x	

From the preceding chart, it is easy to see that five of the six pitches contrast with the other four. The mid tone is our one problematic tone. It is hard to get it to contrast with all the other tones because the mid tone is so rare. Even though it is rare, it does contrast with high and low-falling tones. Since no phonetic rule for combining mid tone with another tone has yet been found, we will consider mid tone to be contrastive with all the others until further evidence proves otherwise.

## 5.2 Grammatical Tone

Contrastive pitch also plays an important role in the grammar of the language. Compare the following examples:

Present perfective	[à wé]	<i>'he has gone'</i>
Present progressive	[à wē]	<i>'he is going'</i>

This shows that pitch can be used to mark grammatical meaning in Bangolan. At the time of this writing, the preceding example is the only place where grammatical tone contrast has been noted, but more grammatical tone may be discovered as further research is done.

## 6 Conclusion

We have used a straightforward structural approach in this work to identify the contrastive units of Bangolan (consonants, vowels and lexical tones). We factored out three "prosodies": palatalisation, labialisation and prenasalization, in order to simplify our presentation of the basic consonant system. We also noted that grammatical tone exists though, at present, it is hard to know how extensive it is in the language.

We feel that further research into Bangolan will not reveal much detail that contradicts what we have said above, though we do feel that more research into lexical and grammatical tone will likely show additional phenomena and hopefully explain the reasons for the rare mid tone. Being the first descriptive linguistic work ever done in this language, we do believe that it will serve as a solid foundation for future research.

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