

A Recommended Alphabet for Maiani, Miani, Mala and Maia -  
Four Languages of the Kaukambaran Language Family\*

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1. Introduction
2. Phonemes
3. Distribution
4. Stress
5. Orthography
- Appendix 1 - Contrasts
- Appendix 2 - Vowel Clusters
- Bibliography

1. Introduction

The Kaukambaran language family is part of the Pihom Stock of the Adelbert Range super-stock of the Trans-New Guinea Phylum. Z'graggen (1971, 1975) lists four languages of the Kaukambaran family (population figures from Z'graggen 1971):

Pay with 610 speakers  
Pila with 580 speakers  
Saki with 2070 speakers  
Tani with 2340 speakers.

In this paper:

Tani = Miani and Maiani  
Pay = Mala  
Saki = Maia (spoken in inland villages)

Not included in this paper:

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\* The authors of this paper live in a village of Maiani-speaking people and it was in this language that we worked on analysis of grammar and phonology first. From there we branched out to Miani, Mala and Maia. In writing we have tried to eliminate abbreviations and state things in a limited technical vocabulary.

Data for the Maiani examples comes from people as the authors took notes upon hearing things around the village. Robert Sambui and Nichlaus Babong spent a great deal of time writing lists of words and pronouncing them for the authors to hear.

For Miani Andrew Gai and Jacob Kulilain provided most of the examples.  
For Mala Peter Maror, Pius Barem and Lazarus Samola provided the examples.  
For Maia Morris Lolomir and Jacob Muain provided the examples.

Pila = Maia (spoken in coastal villages)

Z'graggen used the word for 'talk/word' to name the languages. However, speakers of the languages prefer to use the word for 'what' as the name of their language (1971:47) so these names will be used in this paper.

Maiani and Miani are dialects according to Z'graggen, but Green and Green (1978) find three languages within this one language listed by Z'graggen. However, Green and Green do list the things which would not make their conclusions final; that is, 100 words is a small number to base conclusions on; no attention was given to grammar or syntax, and no attention was given to mutual intelligibility (1978:95).

Phonologically the main difference between the two is that Maiani has only voiceless stops (with the exception of a few words which have a voiced bilabial stop) and Miani has both voiceless and voiced stops as phonemes.

In regard to mutual intelligibility, all Mala speakers live in villages on the coast. Maiani is also spoken in villages on the coast, as well as a few villages inland. Miani and Maia are spoken in more distant villages and up in the mountains. Amongst the national translators working with us the Maiani men can read and speak and hear Mala better than Miani. Socially Maiani-speaking people have more to do with Mala-speaking people.

A good map of the area and bibliography is found in Z'graggen.

## 2. Phonemes

### 2.1. Chart of Phonemes

	Bilabial	Alveolar	Alveo-Palatal	Velar
<hr/>				
MAIANI				
Stops - voiceless	p	t		k
	[p p <sup>h</sup> ]	[t t <sup>h</sup> ]		[k k <sup>h</sup> ]
voiced (rare)	b	d		g
Fricatives - grooved-unrounded-vl		s		
		[s s]		
flat - unrounded -vd	b		y	
	[b w]			
Vibrant - flap		r		
		[r r]		
Lateral		l		
Nasal	m	n		ŋ (rare)
<hr/>				

	Bilabial	Alveolar	Alveo-Palatal	Velar
<b>MIANI</b>				
Stops - voiceless	p	t		k
voiced	[p p <sup>h</sup> ] b	[t t <sup>h</sup> ] d		[k k <sup>h</sup> ] g
Fricatives-grooved-unrounded-vl		s		
-vd		[s s]		
-flat -unrounded-vd	b		ʒ	
	[b w]			
Vibrant - flap		r		
		[r r]		
Nasal	m	n		
<hr/>				
<b>MALA</b>				
Stops - voiceless	p	t		k
- voiced	[p p <sup>h</sup> ] b	[t t <sup>h</sup> ] d		[k k <sup>h</sup> ] g
- voiced-prenasalised	mb	nd		ng
Fricatives-grooved-unrounded-vl		s		
-flat -unrounded-vd	b	[s s]		
	[b w]			
Vibrant - flap		r		
		[r r]		
Lateral		l		
Nasal	m	n		ŋ
<hr/>				
<b>MAIA</b>				
Stops - voiceless	p	t		k
- voiced	[p p <sup>h</sup> ] b	[t t <sup>h</sup> ] d		[k k <sup>h</sup> ] g
Fricatives-grooved-unrounded		s		
-flat -unrounded	b	[s s]		y
	[b w]			

	Bilabial	Alveolar	Alveo-Palatal	Velar
Vibrant - flap		ɾ [ɾ ɾʰ]		
Lateral		l		
Nasal	m	n		

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For all four languages the vowels are as shown in the chart below.

	Front	Central	Back
High	i		u
Mid	e		o
Low		a	

## 2.2 Phonetic similarities and differences

In regard to stops, Maiani makes the least number of distinctions, in that it has only voiceless stops, Miani and Maia have a contrast between voiceless and voiced stops and Mala has a contrast between voiceless and voiced and prenasalized stops.<sup>1</sup> (Voiced stops in Maiani are rare in that they only occur in names and introduced items.)

Maiani, Maia and Mala have a contrast between vibrant and lateral whereas Miani has only a vibrant.

Maiani, Maia and Miani have bilabial and alveolar nasals, whereas Mala has bilabial, alveolar and velar nasals. The velar nasal in Maiani goes into the rare category in that its occurrence has been noted in only one word and its variations or names.

Miani has a voiced alveopalatal grooved fricative [ʒ] which in Maiani and Mala loses some of its strong friction and becomes a flat alveopalatal fricative [ɣ]. Mala has no sound corresponding to this alveopalatal fricative. However, one of the dialects of Miani spoken in a few villages near the coast also has no alveopalatal fricative. This dialect uses [d] or [l] in words which correspond. For example:

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<sup>1</sup> ED: There are no minimal pairs showing contrast between voiced and prenasalised stops. The vast majority of voiced and prenasalised stops in Mala appear to follow this rule: Voiced stops appear realised with prenasalisation unless another voiced stop appears in the immediate environment. May and Loeweke decided against this analysis on the basis that it does not seem to have a phonological basis.

[ʒo]	'I'	Miani, main dialect
[do]	'I'	Miani, small coastal dialect
['emaka]	'I'	Mala
[yo]	'I'	Maiani, Maia
[ʒag]	'water'	Miani, main dialect
[lag]	'water'	Miani, small coastal dialect
[ak <sup>h</sup> ]	'water'	Mala
[yak <sup>h</sup> ]	'water'	Maiani
[yag]	'water'	Maia

In all four languages the alveolar stops, grooved fricatives, and nasals are fronted.

### 2.3. Rare Phonemes in Maiani

Voiced stops /b/, /d/, /g/ occur in only a few words which are either names of people or places or are introduced items:

[buŋ]	'man's name'
[diɖoŋ]	'man's name'
[maŋeg]	'name of a wind'
[baɪ]	'axe'

We have noted [ŋ] in only one word and its variations:

[uŋoŋ]	'itself'
[yoŋoŋ]	'myself'
[ŋoŋoŋ]	'yourself'

or in names:

[leŋeleŋ]	'type of eel'
[meŋeŋa]	'man's name'

### 2.4 Variation - Allophones

2.4.1 In all four languages voiceless aspirated stops occur word finally and voiceless stops occur word initially and medially.

#### Maiani

[maʒip <sup>h</sup> ]	/maʒip/	'storage'
[pumaɪ <sup>h</sup> ]	/pumaɪ/	'he planted'

#### Miani

[teke <sup>h</sup> ]	/tekek/	'break'
[gigiʃip <sup>h</sup> ]	/gigiʃip/	'black cockroach'

#### Mala

[uɪ <sup>h</sup> ]	/uɪ/	'rope'
[muk <sup>h</sup> ]	/muk/	'pot'

## Maia

[kibik <sup>h</sup> ]	/kibik/	'few'
[muat <sup>h</sup> ]	/muat/	'snake'

2.4.2 The vibrant is a flap when occurring between vowels in unstressed syllables. The trill occurs elsewhere.

## Maiani

['suʔat <sup>h</sup> ]	/ʔsuʔat/	'he entered'
['uʔiŋ]	/ʔuʔiŋ/	'plenty'
[aʔʔob]	/aʔʔob/	'go!'

## Miani

['buiʔa]	/ʔbuiʔa/	'sick'
[ʔa]	/ʔa/	'over there'

## Mala

['mboʔem]	/ʔmboʔem/	'understand'
[aʔʔapeʔ]	/aʔʔapeʔ/	'vine'

## Maia

['buʔiʔi]	/ʔbuʔiʔi/	'axe'
['paʔaʔ]	/ʔpaʔaʔ/	'understand'

2.4.3 The voiced bilabial fricative is pronounced with lips flat (unrounded), i.e., [b], when occurring before unrounded vowels /i/ and /e/ within a word. It is pronounced with lips rounded and with voicing [w] when occurring before rounded vowels /o/ and /u/ word initially and medially. Preceding /a/ it is [w] if it follows /o/ or /u/ or silence and it is [b] if it follows /i/ or /e/. Word finally [b] occurs and not [w]. It is [b] when preceded and followed by /a/.

## Maiani

[wui <sup>b</sup> ]	/bui <sup>b</sup> /	'leaf'
[wok <sup>h</sup> ]	/bok/	'whistle'
[ubi]	/ubi/	'some'

## Miani

[bimob]	/bimob/	'count'
[wuimup]	/bui <sup>m</sup> up/	'his name'

## Mala

[wuime]	/buime/	'younger brother'
[ibipi]	/ibipi/	'throw away'
[umiʔab]	/umiʔab/	'boastful'

## Maia

['wugaʔ]	/ʔbugaʔ/	'blow a fire'
['ʔaba]	/ʔʔaba/	'fence'

2.4.4 Lip rounding influences the grooved voiceless fricative which is pronounced with rounded lips when preceding rounded vowels and unrounded lips preceding unrounded vowels.

## Maiani

[ʒoʔokʰ]	/ʒoʔok/	'startle'
[ʒuʔ]	/ʒuʔ/	'come in'
[ʒeʒekʰ]	/ʒeʒek/	'send'

## Miani

[pueʒe]	/pueʒe/	'old woman'
[ʒorob]	/ʒoʔob/	'pleasant place'

## Mala

[paʒuŋ]	/paʒuŋ/	'come down'
[ʒilal]	/ʒilal/	'hawk'

## Maia

[ʒoʒoir]	/ʒoʒoiʔ/	'messenger'
[iʒipegimi]	/iʒipegimi/	'we are reading'

2.4.5 In Mala /t/ and /ʒ/ contrast in word final position, but not word initially or medially. In word initial and medial positions /t/ occurs preceding low vowels /e/, /a/, /o/ and /ʒ/ occurs before high vowels /i/ and /u/.

## Word final contrasts (Mala):

[kaʒ]	/kaʒ/	'shoot'
[paʔʰ]	/paʔ/	'canoe'
[obiʒ]	/obiʒ/	'make good'
[uʒiʔʰ]	/uʒiʔ/	'his whiskers'
[mbuluwuʒ]	/mbulubʒ/	'turn'
[uʔʰ]	/uʔ/	'rope'

/ʒ/ occurs preceding high vowels word initially and medially:

[ʒimʌ]	/ʒimʌ/	'crayfish'
[miʔʰʒib]	/miʔʰʒib/	'ground'
[ʒuʔʰʒumb]	/ʒuʔʰʒumb/	'mud'

/t/ occurs preceding low vowels:

[aʔapeʔʰ]	/aʔapeʔʰ/	'vine'
[oʔom]	/oʔom/	'they give'

In Maiani morphophonemics explains the /t/ and /ʒ/ changes. When the last letter of a verb stem is /t/, it changes to /ʒ/ when the following suffix starts with a high vowel:

## Maiani

/yak	it-av/	
water	wash-purpose	'to bathe'

/yak	it-omo/	
water	wash-I.past.tense	'I bathed'

/yok iʃ-ikemo/  
water wash-I.present.tense 'I am bathing'

In Miani morphophonemics /ɨ/ occurs as last sound of stem preceding suffix starting with low vowel. /ʃ/ occurs as last sound of stem preceding high or mid vowels:

#### Miani

/ʒag iɨ-av/  
water wash-purpose 'to bathe'

/ʒag iɨ-amo/  
water wash-I.past.tense 'I bathed'

/ʒag iʃ-egemo/  
water wash-I.present.tense 'I am bathing'

### 3. Distribution

#### 3.1 Syllable patterns

In the following lists, C represents consonant and V represents vowel. The lists show the kinds of syllables found in the four languages. The language example is first written in orthographic script, and the English meaning follows:

V	a.rov	'go'	(Maiani)
	o	'his'	(Miani)
	a.la	'white'	(Mala)
	i.da	'ground'	(Maia)
VV	ai	'sugarcane'	(Maiani, Maia)
	au	'black'	(Mala)
	ao	'reply'	(Miani, Maia)
VC	at	'canoe'	(Maiani, Miani)
	ot	'very high'	(Miani)
	ak	'water'	(Mala)
	aw	'village'	(Maia)
CV	si	'string bag'	(Maiani, Mala)
	te.re.mu	'today'	(Miani)
	no	'you (sg.)'	(Maiani, Miani, Maia)
CVC	rap	'basket'	(Maiani)
	ga.rom	'bone'	(Miani)
	ner	'two'	(Mala)
	gin	'kitchen shelf'	(Maia)
CVV	tao	'moon'	(Miani, Mala)
	mau.rep	'sweet potato'	(Maiani)
	ewi.tae	'they like'	(Mala)
	mua.do	'man'	(Miani, Maia)



CVVC	muat	'snake'	(Maiani, Miani, Maia)
	kaun.ke.rat	'he shouted'	(Maiani)
	ke.pues	'you bend it'	(Miani)
	neiw	'your hair'	(Mala)
	si.baur	'lobster'	(Maia)
CVVV	puai	'breadfruit'	(Maiani)
	buae	'breadfruit'	(Miani)
	suai	'you get it'	(Mala)
CVVVC	puait	'he cut it'	(Maiani)
	mi.kiaek	'he finds'	(Mala)
	muain	'feast'	(Miani)

### 3.1.1 Interpretation

Because there are no consonant clusters within non-ambiguous syllables:

1. prenasalized stops in Mala are interpreted as units;
2. voiceless aspirated stops in all three languages are interpreted as units;
3. what could be called labialization and palatalization is interpreted as vowels and not consonants.

Because there are reverse sequences in vowel clusters and because there are clusters involving low vowel phonemes, vowel clusters have been interpreted as sequences of vowels and not as units.

### 3.1.2 Distribution of phonemes into syllables

In all three languages all consonant phonemes fill the consonant slots of VC, CV, and CVC syllable types.

CVV, CVVC, CVVV, and CVVVC syllable types are not as numerous and hence not all consonant phonemes have been noted in all the consonant slots of these syllables. However, with more data, it would be expected that all consonant phonemes fill all consonant slots of these syllables.

All vowel phonemes fill all vowel slots in V, VC, CV, and CVC syllable types.

### 3.1.3 Vowel clusters

The following clusters of two vowels occur in Maiani (1), Miani (2), Mala (3), and Maia (4). (Examples are given in Appendix 2.)

	a	i	e	u	o
a		1234	234	1234	1234
i	1234		234	3	1234
e	234	34		2	23
u	1234	1234	1234		234
o	234	1234	3		

In addition, /u/ may precede /ai/ in all four languages;

/puai/	'breadfruit'	(Maiani)
/muaiŋ/	'feast'	(Miani)
/uŋuair/	'old'	(Mala)
/muaiŋ/	'generous'	(Maia)

/u/ may precede /ia/ in Maia;

/buiarab/	'to cook'	(Maia)
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/e/ may precede /ia/ in Maia;

/muekeia/	'he came back'	(Maia)
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/i/ may precede /ai/ in Miani and Maia;

/abia/	'will you go'	(Miani)
/igia/	'are you here?'	(Maia)

/u/ may precede /ae/ in Miani and Maia;

/buae/	'breadfruit'	(Miani)
/ibuae/	'our father'	(Maia)

/a/ may precede /iu/ in Maia;

/lubaŋa/	'something lost'	(Maia)
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/i/ may precede /ao/ and /o/ may precede /ua/ in Mala;

/ingiauba/	'no good'	(Mala)
/engoroua/	'he washed them'	(Mala)

and /a/ may precede /ia/ in Maia and Maiani.

/baiaa/	'daybreak'	(Maia)
/baiaŋa/	'daybreak'	(Maiani)

### 3.2 Distribution of syllables into words

In Maiani and Miani syllables that end with a consonant, such as CVC and CVVC, occur as single syllable words or come as the last syllable of a word. When these closed syllables (which coincide with verb stems) occur prior to the last syllable(s), a transitional vowel is said in slow speech. Some people write this transitional vowel, and others do not. Examples of the transitional vowel in Maiani are as follows:

kaun.ke.rat	or	kau.ni.ke.rat	'he shouted'
ma mis.ke	or	ma mi.si.ke	'she is cooking'
im.ne	or	i.mi.ne	'let's eat'
tam.si	or	ta.mi.si	'hear and'

The above shows syllable boundaries. To show the mismatch between syllable and morpheme boundaries, the following shows the words above broken for morphemes:

/kauŋ-keʃ-aʃ/	
shout-habitual-3rd.past.tense	'he shouted'
/ma miʃ-ke/	
something cook-1st.pres.tense	'she is cooking'
/im-ne/	
eat-command.plural	'let's eat'
/tam-ʃi/	
hear-successive.action.medial.suf	'hear and'

Because there is this strong tendency away from consonant clusters even across syllable boundaries, and because perception hears consonants at the beginning of syllables rather than at the end, VC syllables do not occur within words. They occur as single syllable words.

### 4. Stress

In all four languages stress is contrastive and thus phonemic. Examples of contrastive stress are as follows:

#### Maiani

/'apa/	'father's sister'
/a'pa/	'season'
/'uʃum/	'wet'
/u'ʃum/	'hide'
/'uʃiʃi/	'he shot it and'
/u'ʃiʃi/	'he gave it to him and'
/'neʃike/	'he is giving it to you (pl)'
/ne'ʃike/	'he is giving it to you (sg)'

## Miani

/u'pu/	'ripe'
/u'pu/	'red'
/ga'gəɬəb/	'to take it down'
/'gəgəɬəb/	'to look at'
/'u'ʀəm/	'his stomach'
/u'ʀəm/	'basket'

## Mala

/'umia/	'be quiet'
/u'mia/	'you will die'
/'baba/	'older brother'
/ba'bam/	'possum'

## Maia

/i'supe/	'to me'
/'isupe/	'to us'
/ŋi'buə/	'your father'
/'ŋibuə/	'all you fathers'

An interesting feature of stress has been noted in comparing two syllable words that are similar in all four languages. Maia tends to stress the first syllable, whereas Maiani, Miani and Mala stress the second syllable.

/'əɾəp/	'three'	(Maia)
/ə'ʀəp/	'three'	(Maiani, Miani)
/ŋə'ʀəp/	'three'	(Mala)
/'ulum/	'dirty'	(Maia)
/u'lum/	'dirty'	(Maiani, Mala)
/u'ʀum/	'dirty'	(Miani)

## 5. Orthography

The orthography recommended for the four languages is as follows:

PhonemeOrthographic Symbol

	Maiani	Miani	Mala	Maia
/p/	p	p	p	p
/b/	b (rare)	b	b	b
/mb/			mb	
/t/	t	t	t	t
/d/	d (rare)	d	d	d
/nd/			nd	
/k/	k	k	k	k
/g/	g (rare)	g	g	g
/ŋg/			ng	

Phoneme	Orthographic Symbol			
	Maiani	Miani	Mala	Maia
/b/	w (/v)	w/v	w (/v)	w/v
/y/	y			y
/z/		y		
/s/	s	s	s	s
/ʃ/	r	r	r	r
/l/	l		l	l
/m/	m	m	m	m
/n/	n	n	n	n
/ŋ/	ng (rare)		ng	
/a/	a	a	a	a
/e/	e	e	e	e
/i/	i	i	i	i
/o/	o	o	o	o
/u/	u	u	u	u
Stress	- - - - -	not written	- - - - -	- - - - -
Transition vowels	- - - - -	write them	- - - - -	- - - - -

5.1 From the chart it will be noted that there is no orthographic distinction for the two phonemes /ŋ/ and /ŋg/ in Mala. We have met no one yet who writes these differently. The speakers of this language do not seem to hear a difference. So far there is no problem in distinguishing words even though the two phonemes are written alike.

5.2 In all three languages the men at first decided to write the allophones: w and v. The following spelling rules apply:

w precedes u and o

v precedes i, e, and a

w occurs word final (because this is the way it is usually written - even though in pronunciation it should be v.)

This is still a problem area because when the men are not concentrating on sounds, they use v and w interchangeably - even in the spelling of the same word. When they are concentrating on sounds, they hear the difference and will write it correctly. Because they hear it, (probably from contact with English) they want to write it. However, when they are concentrating on translating meaning, they mix up v and w and it is left to be straightened in editing.

If the problem persists, we would recommend that only w be written. However, the men will have to be convinced of it before they will change. There has been great inconsistency in spelling w and v and Maiani and Mala are tending toward w only.

5.3 None of the men write stress as it makes the words look too different from English or Tok Pisin. Context usually defines words and usually there has been no problem in not writing stress. However, there have been a couple of problems and we are still "talking" about what to do. They have made two suggestions.

1. Precede stressed syllable with h, which is not in alphabet.
2. Double the first consonant of a stressed syllable.

Neither solution has been agreed upon as they realize that inconsistency and confusion in spelling would be greater than the couple of words which are ambiguous because of stress.

5.4 It is suggested that transitional vowels be written as the men seem to prefer not to write the "shortened form" as they call it.

5.5 Punctuation. The men write periods or question marks at the end of sentences. They write commas between items that are listed. They put quote marks around direct quotes.

## APPENDIX 1

### Contrasts

#### Maiani

/t/, /s/, /r/, /l/

#### Word initial:

[tə'pɪʃ]	/tə'pɪʃ/	'dish'
[səpʰ]	/səp/	'food'
[rəpʰ]	/rəp/	'basket'
[ləpʰ]	/ləp/	'youth'
['tɪwəʃ]	/tɪbət/	'he went'
[sɪrəʃ]	/sɪrət/	'he entered'
[rɪwəʃ]	/rɪbət/	'he waited'
[lɪləʃ]	/lɪlət/	'with sand'

#### Word Medial:

[u'tɪ]	/u'tɪ/	'banana'
[u'sɪpʰ]	/u'sɪp/	'to him'
[u'ɪɪ]	/u'ɪɪ/	'plenty'
[u'liɪ]	/u'liɪ/	'play'
[a'tɪb]	/a'tɪb/	'go into'
[a'so]	/a'so/	'tree type (talis)'
[a'rɪb]	/a'rɪb/	'go'
[a'lob]	/a'lob/	'go through water/wade across'

#### Word Final:

[wɪʃ]	/buʃ/	'tree type'
[wɪʃ]	/buʃ/	'singsing name'
['muoʃ]	/muoʃ/	'snake'
['yemuoʃ]	/yemuoʃ/	'my friend'
[sɪ'pouʃ]	/sɪ'pouʃ/	'lobster'
[kəʊl]	/kəʊl/	'fish hook'

[ya'baʃ]	/ya'baʃ/	'name of wind'
[ya'bal]	/ya'bal/	'crazy'
/u/, /o/		
[mum]	/mum/	'owl'
[mom]	/mom/	'sisal'
[upʰ]	/up/	'deep'
[opʰ]	/op/	'dye'
/u/, /i/		
[ʔupisi]	/ʔupisi/	'take it out'
[ʔi'pi]	/ʔi'pi/	'how much'
/i/, /e/		
[u'pi]	/u'pi/	'heavy'
[u'pe]	/u'pe/	'hole'
[piʃ]	/piʃ/	'scraper'
[peʃ]	/peʃ/	'two'

## Miani

/p/ and /b/

## Word Initial:

[pa'da]	/pa'da/	'finish'
[ʔbaba]	/ʔbaba/	'brother'
[pua'ʔaŋeŋ]	/pua'ʔaŋeŋ/	'miles'
[bua'ʔaʃiŋ]	/bua'ʔaʃiŋ/	'feast'
[pue'se]	/pue'se/	'old woman'
[ʔbueŋe]	/ʔbueŋe/	'share out'

## Word Medial:

[ʔa'pa]	/ʔa'pa/	'mountain'
[a'ba]	/a'ba/	'area'
[ʂa'pumaʃ]	/ʂa'pumaʃ/	'basket'
[ʂu'bum]	/ʂu'bum/	'garamut'
[a'pueŋe]	/a'pueŋe/	'bend underneath'
[ʃi'bueŋe]	/ʃi'bueŋe/	'come first'

## Word Final:

[ʂipʰ]	/ʂip/	'bring'
[ʂib]	/ʂib/	'crayfish'
[a'ʔopʰ]	/a'ʔop/	'three'
[ʂob]	/ʂob/	'ditch'

[ʔapʰ]	/ʔap/	'young boy'
[ʔab]	/ʔab/	'woven basket'

/t/, /d/, /r/

Word Initial:

[ta]	/ta/	'talk'
[da]	/da/	'another'
[ʔa]	/ʔa/	'over there'

['tuʔan]	/['tuʔan]/	'he threw it away'
['duʔa]	/['duʔa]/	'tail'

Word Medial:

[a'ta]	/a'ta/	'coconut'
[na'da]	/na'da/	'child'

['uʔan]	/['uʔan]/	'he shot it'
['mu'da]	/['mu'da]/	'his eye'
[a'dan]	/a'dan/	'he withdrew'

[mu'tuʔum]	/mu'tuʔum/	'old'
[mu'duʔu]	/mu'duʔu/	'spinach (aibika)'
['uʔuwu'dua]	/['uʔuwu'dua]/	'everyone'

Word Final:

[otʰ]	/otʰ/	'very high'
[od]	/od/	'blood'
[me'soʔ]	/me'soʔ/	'true'

/t/ and /s/

Word Initial:

[ti'bab]	/ti'bab/	'garden'
[sib]	/sib/	'crayfish'
['tuʔob]	/['tuʔob]/	'throw away'
['suʔen]	/['suʔen]/	'he went into the water'

Word Medial:

[te'te]	/te'te/	'large beetle'
[a'se]	/a'se/	'wild galip'

[mu'tuʔum]	/mu'tuʔum/	'old'
[u'subob]	/u'subob/	'push it'

[a'to]	/a'to/	'wild'
[i'sob]	/i'sob/	'deep in the bush'

Word Final:

[atʰ]	/atʰ/	'canoe'
[was]	/bas/	'pig'



## /k/ and /g/

## Word Initial:

['kepeʃ]	/ˈkepeʃ/	'little knife'
['gemoɖ]	/ˈgemoɖ/	'they are'
['kumu]	/ˈkumu/	'plenty'
['gugun]	/ˈgugun/	'shadow'

## Word Medial:

[uˈkaʃ]	/uˈkaʃ/	'hot'
[uˈga]	/uˈga/	'his skin'
[keˈkebe]	/keˈkebe/	'new garden'
[meˈgeʃa]	/meˈgeʃa/	'tomorrow'
[uˈkuʃuwaŋ]	/uˈkuʃuwaŋ/	'he spoiled it'
[uˈgum]	/uˈgum/	'banana type'

## Word Final:

['ʒakʒakʰ]	/ˈʒakʒak/	'rattling noise'
[ʒag]	/ʒag/	'water'
[piˈʃikʰ]	/piˈʃik/	'translate'
[gig]	/gig/	'tie up'

## /ʃ/ and /ʒ/

## Word Initial:

[ʒo]	/ʒo/	'I'
[ʃoʃokʰ]	/ʃoˈʃok/	'startle'
['ʒino]	/ˈʒino/	'my'
['ʃina]	/ˈʃina/	'shame'

## Word Medial:

[iˈʒem]	/iˈʒem/	'new'
[iˈʃab]	/iˈʃab/	'sun'
[weˈʒeʃob]	/beˈʒeʃob/	'fight me'
[weˈʃeʃ]	/beˈʃeʃ/	'finish'

## Word Final:

[aʒ]	/aʒ/	'sugar cane'
[waʃ]	/baʃ/	'pig'

## /i/ and /u/

['gigob]	/ˈgigob/	'fasten'
[guˈgob]	/guˈgob/	'cut bamboo'

## /i/ and /e/

[uˈbi]	/uˈbi/	'heavy'
[uˈbe]	/uˈbe/	'hole'

[dɪ'gob]	/dɪ'gob/	'bush'
[de'gob]	/de'gob/	'pull down fruit'
/u/ and /o/		
[su'bum]	/su'bum/	'garamut'
[a'bom]	/a'bom/	'old'
['mado]	/mado/	'his skin'
[ma'duʃu]	/ma'duʃu/	'spinach (aibika)'

## Mala

/p/, /b/, /mb/

## Word Initial:

[peɪʰ]	/peɪ/	'rope'
['bebi]	/'bebi/	'rain'
['mbeʃibi]	/'mbeʃibi/	'run'
[poŋ]	/poŋ/	'turtle'
[boɔa]	/'boɔa/	'feces'
['mboʃem]	/'mboʃem/	'understand'
[pa'ʃaʃa]	/pa'ʃaʃa/	'dry'
[ba'ʃabaʃa]	/ba'ʃabaʃa/	'breadth'
[mba'kaŋ]	/mba'kaŋ/	'coconut shell'

## Word Medial:

[a'tapeʃ]	/a'tapeʃ/	'vine'
['tabe]	/'tabe/	'red fish'
['ombe]	/'ombe/	'hole'
[ma'paʃ]	/ma'paʃ/	'possum/animal'
[ba'baʃ]	/ba'baʃ/	'call'
[ta'mbaʃ]	/ta'mbaʃ/	'tree type'

## Word Final:

['mauʃepʰ]	/'mauʃep/	'sweet potato'
[deb]	/deb/	'garden'
[lemb]	/lemb/	'a sail'
[lapʰ]	/lap/	'boy'
[a'dab]	/a'dab/	'joint'
[ʃamb]	/ʃamb/	'basket'
[opʰ]	/op/	'red dye'
[u'bob]	/u'bob/	'triton conch shell'
[o'tomb]	/o'tomb/	'ditch'

/t/, /s/, /d/, /nd/

(Note: /t/ and /s/ do not contrast word initially and word medially.  
See section on Allophones.)

## Word Initial:

['tekeliʃ]	/ˈtekeliʃ/	'send'
['deb]	/ˈdeb/	'garden'
[t̪aˈpa]	/t̪aˈpa/	'mountain'
['daba]	/ˈdaba/	'fire died out'
['ŋda]	/ˈŋda/	'another'

## Word Medial:

[paˈsuŋ]	/paˈsuŋ/	'come down'
[duˈduʃ]	/duˈduʃ/	'hibiscus'
[iˈŋduwua]	/iˈŋduwua/	'you (pl) go'
[aˈtəpeʃ]	/aˈtəpeʃ/	'rope'
[aˈdab]	/aˈdab/	'joint'
[nuˈŋdai]	/nuˈŋdai/	'ask'

## Word Final:

[maˈkit̪ʰ]	/maˈkit̪/	'knife'
[biɖ]	/biɖ/	'fence'
[ŋat̪ʰ]	/ŋat̪/	'canoe'
[baɖ]	/baɖ/	'down below'
[baŋɖ]	/baŋɖ/	'pandanus'

## /ŋ/ and /ŋ/

## Word Initial:

[ŋeʃ]	/ŋeʃ/	'forbidden'
[ŋeʃ]	/ŋeʃ/	'two'
[ŋab]	/ŋab/	'betelnut'
[ŋaʃi]	/ŋaʃi/	'mosquito'

## Word Medial:

[muˈŋam]	/muˈŋam/	'stone'
[kaˈŋaʃ]	/kaˈŋaʃ/	'sand'

## Word Final:

[ŋaˈmuŋ]	/ŋaˈmuŋ/	'saucepan'
[kuˈʃuŋ]	/kuˈʃuŋ/	'drum'

## /k/, /g/, /ŋg/

## Word Initial:

['kalipʰ]	/ˈkalip/	'kunai grass'
['gəɖ]	/ˈgəɖ/	'orphan'
['ŋgəɖ]	/ˈŋgəɖ/	'rhino beetle'

## Word Medial:

['ekoŋdi]	/'ekoŋdi/	'neighbour'
['ogom]	/'ogom/	'many'
['ŋengom]	/'ŋengom/	'your chest'
['mbakən]	/'mbakən/	'coconut shell'
['iŋgaʉa]	/'iŋgaʉa/	'bad'

## Word Final:

[ak <sup>h</sup> ]	/ak/	'water'
[bag]	/bag/	'sorry'
[aŋg]	/aŋg/	'false'
[muk <sup>h</sup> ]	/muk/	'pot'
[bug]	/bug/	'wind'
[i'ŋok <sup>h</sup> ]	/i'ŋok/	'sleep'
[bi'ŋog]	/bi'ŋog/	'armband'

## /ʃ/ and /l/

## Word Initial:

[ʃi'ŋai]	/ʃi'ŋai/	'red fish'
['lima]	/'lima/	'shell fish'
[ʃuaɬ <sup>h</sup> ]	/ʃuaɬ/	'friend'
[lu]	/lu/	'runners for sliding a canoe along'
['ʃamb]	/'ʃamb/	'reed basket'
['lam]	/'lam/	'outrigger'

## Word Medial:

['iʃumb]	/'iʃumb/	'my wife'
[i'lu]	/i'lu/	'worm'
[ma'ʃoɬ <sup>h</sup> ]	/ma'ʃoɬ/	'squid'
[ŋa'lok <sup>h</sup> ]	/ŋa'lok/	'crow'

## Word Final:

[te'teʃ]	/te'teʃ/	'hole in ground'
['umbuɬel]	/'umbuɬel/	'navel'
[a'ŋaʃ]	/a'ŋaʃ/	'cloth'
[a'ŋal]	/a'ŋal/	'crazy'

## /i/, /e/

['mbiʃ]	/'mbiʃ/	'shield'
[mbeʃibi]	/'mbeʃibi/	'he runs'
[ŋiʃ]	/ŋiʃ/	'crab'
[ŋeʃ]	/ŋeʃ/	'two'

/i/, /u/		
[ba'dim]	/ba'dim/	'bed'
[u'mbuŋ]	/u'mbuŋ/	'fallen trees dividing garden plots'

/u/, /o/		
['mum]	/'mum/	'bird type'
['ŋimom]	/'ŋimom/	'you (pl) eat'
['ombu]	/'ombu/	'he too'
['simbo]	/'simbo/	'sneeze'

## Maia

/p/ and /b/

## Word Initial:

['piʃikaɬ <sup>h</sup> ]	/'piʃikaɬ/	'turn'
['biʃiŋa]	/'biʃiŋa/	'he ran'
[pue'tɛba]	/pue'tɛba/	'he runs'
[bueb]	/bueb/	'break'

## Word Medial:

['wuibi]	/'buibi/	'heavy to carry'
['wuipi]	/'buipi/	'their tongues'
['ipapa]	/'ipapa/	'he falls down'
[di'babuʃ]	/di'babuʃ/	'eel'
['ŋapaʃ]	/'ŋapaʃ/	'wallaby'
['ɣabab]	/'ɣabab/	'my brother'

## Word Final:

[i'sip]	/i'sip/	'read'
[wuib]	/buib/	'excreta'

/t/ and /d/

## Word Initial:

['taba]	/'taba/	'fence'
['dɔwua]	/'dɔbua/	'house'

## Word Medial:

['abiɬo]	/'abiɬo/	'they will go'
['abiɬo]	/'abiɬo/	'he will go'
['muɔɬa]	/'muɔɬa/	'habit'
['muɔdo]	/'muɔdo/	'man'
[u'taga]	/u'taga/	'he gave it to him'
[u'daŋo]	/u'daŋo/	'cheek'

## /k/ and /g/

## Word Initial:

['kebe]	/'kebe/	'sago leaves'
['geb]	/geb/	'cut'

## Word Medial:

['okok <sup>h</sup> ]	/'okok/	'place'
[i'gok <sup>h</sup> ]	/i'gok/	'you stay'
['duaka]	/'duaka/	'only one'
['duaga]	/'duaga/	'living together'

## Word Final:

[muak <sup>h</sup> ]	/muak/	'credit'
['samag]	/'samag/	'singsing'

## /ʃ/ and /l/

## Word Initial:

['lililɪa]	/'lililɪa/	'jump away from water'
['ʃiʃiʃ]	/ʃiʃiʃ/	'make room'

## Word Medial:

['kuʃum]	/'kuʃum/	'sick'
['ulum]	/'ulum/	'dirty'
['keʃek <sup>h</sup> ]	/'keʃek/	'getting dark'
['kelem]	/'kelem/	'true'

## Word Final:

[a'doboʃ]	/a'doboʃ/	'green'
['dodol]	/'dodol/	'group'
[wa'bil]	/ba'bil/	'grease'
[u'ɬabiʃ]	/u'ɬabiʃ/	'top of my foot'
['iguʃ]	/'iguʃ/	'five'
['ul]	/ul/	'cough'

## /s/ and /t/

## Word Medial:

['isab]	/'isab/	'hot'
['itab]	/'itab/	'get us'
[u'toʃok <sup>h</sup> ]	/u'toʃok/	'strong man'
['soʃok <sup>h</sup> ]	/'soʃok/	'wire'

## Word Final:

[was]	/bas/	'call out'
[muat <sup>h</sup> ]	/muat/	'snake'
[bes]	/bes/	'hold it'
[bet <sup>h</sup> ]	/bet/	'sit down'

/i/ and /u/		
[i'tabiʃ]	/i'taboʃ/	'top of my foot'
['tawuʃ]	/'tabuʃ/	'ashes'
/i/ and /e/		
[iʃ]	/iʃ/	'leave it for us'
[eʃ]	/eʃ/	'give me'
['kiʃikʰ]	/'kiʃik/	'turn a log'
['keʃekʰ]	/'keʃek/	'getting dark'
/u/ and /o/		
[ʒub]	/ʒub/	'extract'
[ʒob]	/ʒob/	'creek'
['uŋu]	/'uŋu/	'red'
['oŋo]	/'oŋo/	'that one'
/i/, /e/, /o/, /a/		
[i'gimi]	/i'gimi/	'I am here'
[i'geme]	/i'geme/	'you all are here'
[i'gomo]	/i'gomo/	'they are here'
[i'gama]	/i'gama/	'in front'
/i/, /e/, /u/, /o/, /a/		
[bikʰ]	/bik/	'whistle to get attention'
[bekʰ]	/bek/	'burn down'
[wikʰ]	/buk/	'blow out smoke'
[wokʰ]	/bok/	'whistle a tune'
[bakʰ]	/bak/	'sisal'

## APPENDIX 2

## Vowel Clusters

/ai/	/ai/	'sugar cane' (Maiani, Maia)
	/kai/	'over there' (Maiani)
	/bail/	'axe' (Maiani)
	/maid/	'garden' (Miani)
	/aino/	'they' (Mala)
	/gaɪda/	'tied' (Maia)
/ae/	/nabaese/	'he came back' (Miani)
	/baeʃ/	'laugh' (Miani)
	/kobaek/	'I go' (Mala)
	/eviʔae/	'I want' (Mala)
	/daebaʃab/	'we will dig' (Maia)
/au/	/kaul/	'hook' (Maiani)
	/mauʃep/	'sweet potato' (Maiani, Mala)
	/ʔaubob/	'close it' (Miani)

	/aumbeneŋ/	'ten' (Mala)
	/kekau/	'ashes' (Maia)
/ao/	/kaon/	'there' (Maiani)
	/tao/	'moon' (Maiani, Miani)
	/nabaob/	'you go back' (Miani)
	/naosifi/	'black' (Mala)
	/yao/	'who' (Maia)
/ia/	/aulia/	'bird type' (Maiani)
	/miani/	'what' (Miani)
	/abian/	'he went' (Miani)
	/aŋia/	'all right' (Mala)
	/ukiaob/	'old' (Maia)
/ie/	/indubie/	'are you going?' (Mala)
	/abiege/	'I'm going' (Miani)
	/iesido/	'he will give us' (Maia)
/iu/	/iuŋa/	'it satisfied me' (Mala)
/io/	/piob/	'you fly' (Maiani)
	/taŋio/	'you must talk' (Miani)
	/iŋio/	'you must come up' (Miani)
	/ionŋ/	'my blood' (Mala)
	/iobiŋi/	'make me become well' (Mala)
	/baŋupio/	'I will hit' (Maia)
/ea/	/segeab/	'small string bag' (Miani)
	/mueŋea/	'young boy' (Miani)
	/nepamea/	'only your hand' (Mala)
	/muekeamo/	'I went back' (Maia)
/ei/	/neib/	'your hair' (Mala)
	/mbaŋei/	'get out of way' (Mala)
	/inegemei/	'is he sleeping?' (Maia)
/eu/	/euŋ/	'their brother-in-law' (Miani)
/eo/	/abeob/	'hold it' (Miani)
	/eonŋ/	'our blood' (Mala)
/ua/	/muato/	'man' (Maiani)
	/upuaŋ/	'visitor' (Maiani)
	/mualbiŋi/	'tie up and' (Maiani)
	/amuab/	'to cry' (Miani)
	/muado/	'man' (Miani, Maia)
	/umuak/	'his head' (Mala)
	/lamua/	'bad' (Maia)
/ui/	/muiŋ/	'knife' (Maiani, Miani)
	/puila/	'sick' (Maiani)
	/buib/	'leaf' (Miani)
	/mui/	'spear' (Mala)



	/mũifa/	'young boy' (Maia)
/ue/	/mũeŋa/	'shell' (Maiani)
	/pueŋ/	'he breaks' (Maiani)
	/pueŋe/	'run' (Miani)
	/iŋdũbue/	'they'll go' (Mala)
	/iŋebuega/	'he is coming' (Maia)
/uo/	/gagaŋuob/	'make it come down' (Miani)
	/ubuok/	'he'll go ahead' (Mala)
	/iŋebuomoi/	'did they come?' (Maia)
/oa/	/oag/	'voice' (Miani)
	/oŋomoagag/	'he already passed them' (Miani)
	/oboaf/	'mouth' (Miani)
	/oakua/	'he pointed it out' (Mala)
/oe/	/oef/	'his father-in-law' (Mala)
/oi/	/ŋomoiy/	'stone' (Maiani)
	/oimb/	'their feces' (Mala)
	/pueŋebomoi/	'did they run?' (Maia)
	/iobemoi/	'did they get it?' (Miani)

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