

## 1 DESCRIPTION OF PHONEMES

## 1.1 Phoneme Chart

## 1.1.1 Consonants

	Bilabial	Alveolar	Velar	Glottal
Stops	p	t	k	ʔ
Fricatives	ɸ	s	g	
Nasals	m	n	ŋ	
Lateral		l		
Trill		r		
Semi-vowels	w	y		

## 1.1.2 Vowels

	Front	Central	Back
High	i	ɨ	u
Mid	ɛ	ʌ	(ɔ)*
Low		a	

\* See section 7.6 Unresolved Issues.

u typed as u in phonetic data, and · represents length. ~ means fluctuation.

## 1.2 Description

## 1.2.1 Consonants

There are fourteen consonant phonemes in the Ningil language. They contrast in point of articulation as to labial, alveolar, velar and glottal, and in manner of articulation as to stops, fricatives, nasals, lateral, trill and semi-vowels. In point of articulation the

stops contrast as to labial, alveolar, velar and glottal. The fricatives and nasals contrast as to bilabial, alveolar and velar. The semi-vowels contrast as to bilabial and alveolar.

In manner of articulation, the labials contrast as to stop, fricative, nasal and semi-vowel. The alveolars contrast as to stop, fricative, nasal, lateral, trill and semi-consonant. The velars contrast as to stop, fricative and nasal.

### 1.2.2 Vowels

There appear to be six vowel phonemes in the Ningil language. (\*See Unresolved Issues, section 7 for evidence of a seventh vowel.) They contrast in tongue position as to front, central and back, and high, mid and low. The front vowels contrast as to high and mid, and the central vowels as to high, mid and low.

The high vowels contrast as to front, central and back, and the mid vowels as to front and central (and possibly back).

## 2 PHONEME CONTRASTS

### 2.1 Consonants.

/p/, /p̥/

The labial fricative /p̥/ contrast word initially, medially and finally.

/pal̩gi/	['pal̩e'gi]	['p <sup>h</sup> al̩e'gi]	'give me'
/p̥al̩gi/	['p̥al̩e'gi]	['b̥al̩e'gi]	'close'
/gap̥ri/	['gap̥ri]	[gap̥ <sup>h</sup> ri]	'breadfruit'
/gap̥ri/	['gap̥ri]	['gab̥ri]	'brid'
/wʌp̥/	['wʌp̥]		'night'
/yʌp̥/	['yʌ <sup>p̥</sup> ]		'good (masc. plural)'
/yi yʌp̥/	['yi 'yʌp̥]		'myself'

/t/, /s/

The alveolar stop /t/ and the alveolar grooved fricative /s/ contrast word initially, medially and finally.

/sag/	['sag]		'banana'
/tag/	['tag]		'ground, underneath'

/řaŋkɪtʌnɪk/	['řaŋkə'tʌnə <sup>k</sup> ]	['řaŋgə'tʌnə <sup>k</sup> ]	'feathers'
/wʌřigɪsʌnɪk/	['wʌřigə'sʌnə <sup>k</sup> ]		'type of grass cooked with taro'
/mati?/	['mati <sup>ə</sup> ?]	['mat <sup>h</sup> i <sup>ə</sup> ?]	'betelnut'
/mɪsin/	['mɪsi <sup>ə</sup> n]		'man'
/mɪt/	[mɪ <sup>t̚</sup> ]		'belonging to'
/mɪs/	['mɪs]		'cry (1st person plural, 3rd person plural masc.)'

/k/, /g/ /?/

The voiceless velar stop /k/ and the (voiced) velar fricative /g/ contrast word initially, medially and finally. Both /k/ and /g/ contrast with the glottal stop /?/ word finally. /?/ also occurs word medially.

/kʌn/	['kʌn]	['gʌn]	'boy'
/gʌn/	['gʌn]		'brother'
/kɪg/	['ki <sup>ə</sup> g]	['k <sup>h</sup> i <sup>ə</sup> g]	'girl'
/gɪg/	['gi <sup>ə</sup> g]		'ancestor'
/pʌŋkʌlu/	['pʌŋkʌ'lu]	[p <sup>h</sup> ʌŋgʌ'lu]	'fingers (plural)'
/nɪgɪlu/	['nɪgə'lu]		'fish (plural)'
/nʌluki/	['nʌlu'ki]		'epika'
/pʌlɪgi/	['pʌlə'gi]	[p <sup>h</sup> ʌlə'gi]	'... give me'
/sɪg/	['sɪg]		'leaf'
/sɪk/	['sɪ <sup>k</sup> ]		'spear'
/wɪsi?/	['wɪsi <sup>ə</sup> ?]		'sago beetle (plural)'
/gʌřɪg/	[gʌ'řɪg]		'head (singular)'
/gʌrɪk/	[gʌ'rɪ <sup>k</sup> ]		'head (plural)'
/pɪlɪg/	[bə'lɪg]	[pə'lɪg]	'cheek (singular)'
/pɪlɪk/	[bə'lɪ <sup>k</sup> ]	[pə'lɪ <sup>k</sup> ]	'cheek (plural)'
/yɪg/	['yɪg]		'type of bamboo (singular)'
/yɪk/	['yɪ <sup>k</sup> ]		'type of bamboo (plural)'

/lapiʔ/	['lapi <sup>ə</sup> ʔ]	'rib, side'	
/pik/	['pi <sup>k</sup> ]	'yesterday'	
/maʔ/	['maʔ]	'milk'	
/mɛk/	['mɛ <sup>k</sup> ] [mɛ <sup>ik</sup> ]	'sap of breadfruit tree'	
/yaʔɛy/	/yaʔay/	['yaʔay] ['yaʔɛy]	'father'
/naʔɛy/	/naʔay/	['naʔay] ['naʔɛy]	'mother'

The following three words need careful checking:

/lʌg/	[lʌg]	'half'
/lʌk/	['lʌ <sup>k</sup> ]	'pangal'
/lʌʔ/	[lʌʔ]	'plenty', 'mark from a score'
		'scar'

/m/

The voiced labial nasal occurs word initially, medially and finally.

/maʔ/	['maʔ]	'milk'
/wim/	['wɪ <sub>(m)</sub> ] ['wi <sup>ə</sup> m]	'two'
/nʌmik/	['nʌmɛ <sup>k</sup> ]	'eye'

/n/, /ŋ/

The voiced alveolar nasal /n/ and the voiced velar nasal /ŋ/ contrast word finally /n/ also occurs word initially and medially. /n/ and /ŋ/ sometimes fluctuate word medially contiguous to velar stops.

/nɪn/	['-nɪn]	'(subject person) weave'
/nɪŋ/	['nɪŋ]	'meat'
/gilʌn/	['gilʌn]	'carry (one thing)'
/gilʌŋ/	['gilʌŋ]	'carry (more than one thing)'
/gʌnpɪ/	['gʌnpɪ] ['gʌnp <sup>h</sup> i]	'coconut'
/nini/	['ni <sup>ə</sup> ni]	'woman ancestor'
/pʌnkaɹ̃/	['pʌnkaɹ̃] ['p <sup>h</sup> ʌŋgaɹ̃]	'finger'

/w/, /p/

The voiced labial semi-vowel /w/ and the voiceless labial fricative /p/ contrast word initially and medially. They both occur word finally.

/waĩ/	['waĩ]		'house', 'tongue'
/paĩ/	['paĩ]	['p <sup>h</sup> aĩ]	'coconut shoot'
/wʌp/	['wʌp]		'night'
/suwʌku/	['suwʌ'ku]	['suwʌ'kɔw]	'smoke' (tobacco)
/yaw/	['yaw]		'leg'
/wʌlukaw/	['wʌlu'kaw]		'animal (plural)'

/r̃/, /l/, /n/.

The voiced alveolar lateral /l/ contrasts with the voiced alveolar trill /r̃/ word initially, medially and finally. /l/ also contrasts with the voiced alveolar nasal /n/ word initially, medially and finally.

/luwi/	['luwi]	['luwe]	'frog'
/nuwɛy/	['nuwɛy]		'on top of'
/lʌʔ/ *	['lʌʔ]		'plenty', 'scar from a sore'
/naʔ/	['naʔ]		'teeth'
/rʌʔ/	['rʌʔ]		'stand up'
/nɪp̃ĩ/	['nɪp̃ĩ]		'star'
/nɪplay/	[nɪp̃lay]		'sky, cloud'
/gʌn/	['gʌn]		'brother'
/gʌl/	['gʌl]		'no'
/gʌĩ/	['gʌĩ]		'I stand up'
/misiwʌnɪŋ/	['misi'wʌnɪŋ]		'woman'
/gilʌŋ/	['gilʌŋ]		'carry (more than one thing)'

N.B. /l/ and /n/ sometimes fluctuate depending on the speaker.

\* .uncertain.

/y/

The voiced alveolars semi-vowel occurs word initially, medially and finally.

/yi/	['yi]	'I'
/yʌmɪn/	['yʌmən]	'good (singular masculine)'
/biyu/	['biyu]	'you (plural)'
/neyu/	['ne <sup>i</sup> yu]	'two leaf'
/bay/ /bey/,	['bay] ['bey]	'you (singular)'
/yaʔay/ /ya y/	['yaʔay] [yaʔey]	'father'

## 2.2 Vowels

/i/, /i̥/, /u/

The voiced high close central unrounded vocoid /i̥/ contrasts with both the voiced high close front unrounded vocoid /i/ and the voiced high open back rounded vocoid /u/ word medially. /i/ and /u/ also occur word finally. They may be lengthened slightly, when they occur in the word final position.

/sik/	z	['si <sup>ə</sup> k]	'hand'
/sɪk/		['sɪ <sup>k</sup> ]	'spear'
/yɪk/		['yɪ <sup>k</sup> ]	'type of bamboo'
/yuk/		['yu <sup>k</sup> ]	'tail of animal plural)'
/sɪg/		['sɪg]	'leaf'
/wig/		['wi <sup>ə</sup> g]	'type of bird'
/wɪg/		['wɪg]	'bush'
/mɪkiĩ/		['mɛ'kiĩ] [mɛ'k <sup>h</sup> ĩĩ]	'ear'
/luĩ puĩ/		['luĩ baĩ] [luĩ puĩ]	'sago leaf'
/yuĩ/		['yuĩ]	'tail of animal (singular)'
/lumbɪlu/		['lumbə'lu] ['lumpə'lu]	'go (3rd person plural feminine)'
/malu/		['malu] [malu]	'carrier for baby'
/yi/		['yɪ]	'i'
/ni/		['ni] ['ne]	'rain', 'water'

/i/, /ʌ/.

The voiced high close central unrounded vocoid /i/ and the voiced mid open central unrounded vocoid /ʌ/ contrast word medially.

/sik/	['sɪ <sup>k</sup> ]	'spear'
/sʌʔ/	['sʌʔ]	'pig'
/gɪn/	['gɪn]	'I am coming'
/gʌn/	['gʌn]	'brother'
/lɪn/	['lɪn]	'they come (feminine)'
/l n/	['l n]*	'half'

/i/, /ɛ/.

The voiced high close front unrounded vocoid /i/ and the voiced mid open front unrounded vocoid /ɛ/ contrast word medially.

/sik/	['si <sup>ɔk</sup> ]	'hand'
/sek/	['sɛ <sup>ik</sup> ]    ['sɛ <sup>k</sup> ]	'banana (plural)'
/mɛk/	['mɛ <sup>ik</sup> ]    ['mɛ <sup>k</sup> ]	'sap of breadfruit tree'
/pik/	['pi <sup>ɔk</sup> ]    ['p <sup>h</sup> i <sup>ɔk</sup> ]	'yesterday'
/wig/	['wi <sup>ɔg</sup> ]	'type of bird'
/lɛr̄/	['lɛ <sup>a</sup> r̄]    ['lɛr̄]	'ton (tree)'
/lig/	['li <sup>ɔg</sup> ]	'type of breadfruit (kapiak)'

/ɛ/, /ʌ/, /a/.

The voiced mid open front unrounded vocoid /ɛ/ and the voiced mid open central unrounded vocoid /ʌ/ contrast word medially. /ʌ/ also contrasts word medially with the voiced low open central unrounded vocoid /a/.

/mɛk/	['mɛ <sup>k</sup> ]    ['mɛ <sup>ik</sup> ]	'sap of breadfruit tree'
/maʔ/	['maʔ]	'milk'
/waṛ/	['waṛ]	'house', 'tongue'
/wʌṛ/	['wʌṛ]	'3rd person singular (feminine) stand up'

\* uncertain

/weř̄/	['weř̄]		'kapur'
/leř̄/	['leř̄]	['le <sup>a</sup> ř̄]	'ton (tree)'
/lař̄/	['lař̄]		'knife'
/lʌř̄/	['lʌř̄]		'3rd person plural (feminine) stand up'
/sʌʔ/	['sʌʔ]		'pig'
/sag/	['sag]		'banana (singular)'
/sɛk/	['sɛ <sup>ik</sup> ]	['sɛ <sup>k</sup> ]	'banana (plural)'
/pʌʔ/	['pʌʔ]		'faeces'
/sʌʔ/	['sʌʔ]		'pig'
/sapʌʔ/	['sapʌʔ]		'type of bird'
/sʌʔpʌʔ/	['sʌʔpʌʔ]		'pig's dung'

### 3 PHONEME VARIANTS

Not all the fluctuations have been included in examples throughout the paper. This is because they seem to occur at some times with certain words, and not with others. We have recorded only those that we actually heard.

#### 3.1 Consonants

The voiceless bilabial fricative /p/ has two allophones.

/p/ [p] [p̥]      The voiceless bilabial aspirated stop [p̥] and the voiceless bilabial fricative [p̥] fluctuate freely word initially and medially.

/p/ fluctuates with /p/ finally when preceded by another /p/.

/pʌkɪm/ ['pʌkɪm] ['p<sup>h</sup>ʌkɪm] ['pʌk<sup>h</sup>ɪm] ['p<sup>h</sup>ʌk<sup>h</sup>ɪm] 'full'  
 /gʌnpʌp/ /gʌnpʌp/ ['gʌnpʌp] ['gʌnp<sup>h</sup>ʌp] 'one' (masculine)

/p/ [p]  
 /t/ [t]  
 /k/ [k]

Each of the voiceless stops /p/, /t/, /k/, has an unreleased allophone [p̚] [t̚] and [k̚] which occurs word finally.



/p/	[p]	[b]	The voiceless stops may be slightly voiced
/t/	[t]	[d]	initially and medially, especially fol-
	[t]	[t <sup>h</sup> ]	lowing nasals.
/k/	[k]	[g]	The alveolar and velar stops /t/ and /k/
	[k]	[k <sup>h</sup> ]	may be aspirated initially and medially.
/yʌp/		[ˈyʌ <sup>p</sup> ]	'good (masculine plural)'
/pɪp/		[ˈbɪ <sup>p</sup> ] [ˈpɪ <sup>p</sup> ]	'white ant'
/pʌɾkʌn/		[ˈpʌɾkʌn] [ˈbʌɾgʌn]	'she'
/tapapi/		[ˈtapaˈpi] [ˈdabaˈbi]	'small, few'
/mɪt/		[ˈmɪ <sup>t</sup> ]	plural possessive
/pɪt/		[ˈpɪ <sup>t</sup> ] [p <sup>h</sup> ɪ <sup>t</sup> ]	Singular possessive
/matiʔ/		[ˈmatɪ <sup>ʔ</sup> ] [ˈmat <sup>h</sup> ɪ <sup>ʔ</sup> ]	'betelnut'
/sɪk/		[ˈsɪ <sup>k</sup> ]	'spear'
/mʌku/		[ˈmʌku]	'cold'
/mʌŋku/		[ˈmʌŋgu]	'1st person plural eat, '3rd person plural (masculine) eat
/pʌnkaɾ/		[ˈpʌnkaɾ] [pʌnəkəɾ] [p <sup>h</sup> ʌnəkəɾ]	
		[ˈpʌŋgaɾ] [p <sup>h</sup> ʌŋgaɾ]	'finger'
/kʌn/		[ˈkʌn] [gʌn]	'boy'
/kɪg/		[ˈkɪ <sup>g</sup> ] [ˈk <sup>h</sup> ɪ <sup>g</sup> ]	'girl'

### 3.2 Vowels

The voiced high close front unrounded vocoid /i/ has four allophones.

/i/	[i]	[ɪ]	The voiced high close front unrounded vocoid with an offglide of the voiced close central vocoid [i <sup>ə</sup> ] may fluctuate with the voiced high open front unrounded vocoid [ɪ] when followed by a consonant.
	[i]	[e]	The voiced high close front unrounded vocoid [i] sometimes fluctuates with the

voiced mid close front unrounded vocoid  
[e] word finally or preceding a /ʔ/.

/puwi/	[pɔ <sup>u</sup> wi] [pɔ <sup>u</sup> we]	'where'
/ni/	['ni] ['ne]	'water'
/yi/	['yi]	'I'
/mɛliʔmɛliʔ/	['mɛli <sup>ə</sup> ʔ] ['mɛliʔmɛli]	
	['mɛleʔmɛleʔ]	'slowly'
/sik/	['si <sup>ək</sup> ]	'hand'
/pik/	['pi <sup>ək</sup> ] ['p <sup>h</sup> i <sup>ək</sup> ]	'yesterday'
/wim/	['wi <sup>m</sup> ] ['wim]	'two masculine'
/taɾpin/	['taɾpi <sup>n</sup> ] ['t <sup>h</sup> aɾp <sup>h</sup> i <sup>n</sup> ]	'soft'
/lapɪʔ/	['lapɪ <sup>ə</sup> ʔ]	'rib, side'
/nini/	['nini] ['ni <sup>n</sup> i]	'old woman'

The voiced high close central unrounded vocoid /ɨ/ has two allophones.

/ɨ/ [ə] [i]      The voiced mid close central unrounded  
vocaloid [ə] occurs in unstressed syllables.  
[i] occurs elsewhere.

/sik/	['si <sup>k</sup> ]	'spear'
/pip/	['pi <sup>p</sup> ] ['bi <sup>p</sup> ]	'white ant'
/wig/	['wiɡ]	'bush'
/nʌmɪk/	['nʌmɪ <sup>k</sup> ]	'eye'
/misiwʌni /	['misi'wʌnəŋ]	'woman'
/yamɪʔʌm/	['yamə'ʔʌm]	'young man'

N.B. This analysis is extremely tentative. See also Unresolved Issues (Section 7.5).

The voiced mid open front unrounded vocaloid /ɛ/ has three allophones. It has an offglide of voiced high close front unrounded vocaloid [ɛ<sup>i</sup>] or the voiced low open central unrounded vocaloid [ɛ<sup>q</sup>] and tends to fluctuate with these when followed by a consonant.

/sɛk/	['sɛ <sup>k</sup> ]	['sɛ <sup>ik</sup> ]	'banana (plural)'
/mɛk/	['mɛ <sup>k</sup> ]		'sap of breadfruit tree'
/lɛĩ/	['lɛĩ]	['lɛ <sup>a</sup> ĩ]	'ton tree'
/wɛĩ/	['wɛĩ]		'type of spider'

N.B. /ɛ/ tends to fluctuate with /a/ when followed by a /y/.

/pɛy/	/pay/	['pɛy]	['pay]	['bey]	
		['bay]			'you (singular)'
/niplay/	/niplɛy/	[nɔp <sup>h</sup> 'lay]	[nɔp <sup>h</sup> 'lay]		
		[nɔp <sup>h</sup> 'lɛy]	[nɔp <sup>h</sup> 'lɛy]		'cloud, sky', 'type of beetle'
/yaʔay/	/yaʔɛy/	['yaʔay]	['yaʔɛy]		'father'
/naʔay/	/naʔɛy/	['naʔay]	['naʔɛy]		'mother'
/naʔaybabi/	/naʔɛybabi/	['naʔaybabi]			
		['naɛy'babi]			'plenty'
/bayis/	/beyis/	['bayɿs]	['beyɿs]		'big'

For variation of the phoneme /u/ see Section 7.6 Unresolved Issues.

#### 4 DISTRIBUTION OF PHONEMES

##### 4.1 Consonants

##### 4.1.1 Within the Syllable.

All consonants except /ŋ/ occur in the onset slot of CVC and CV syllables. All consonants occur in the coda slot of CVC syllables.

/pay/	/pɛy/	['pay]	['pɛy]	
		['bay]	['bey]	'you (singular)'
/yi yɔp/		['yi 'yɔp]		'myself'
/nuwɛy/		['nuwɛy]		'on top of'
/tapapi/		['tapa'pi]	['daba'bi]	'small, few'
/mɛliʔmɛliʔ/		['mɛliʔmɛliʔ]	['mɛli <sup>o</sup> ʔmɛli <sup>o</sup> ʔ]	
		['mɛleʔmɛliʔ]		'slowly'
/misiwɔnɔŋ/		['misi'wɔnɔŋ/		'woman'
/sik/		['sɿ <sup>k</sup> ]		'spear'

/luř puř/	['luř 'buř]	['luř 'puř]	'sago leaf'	
/kig/	['ki <sup>ə</sup> g]	[k <sup>h</sup> i <sup>ə</sup> g]	'girl'	
/mitig/	['mø'tig]	[mø't <sup>h</sup> ig]	'wife'	
/yaʔay/	/yaʔey/	['yaʔay]	['yaʔey]	'father'
/yap/	['yA <sup>p</sup> ]		'good (masculine) plural'	
/mit/	['mi <sup>t</sup> ]		'possessive (plural)'	
/paligi/	['palø'gi]	['p <sup>h</sup> alø'gi]	'subject person give me'	
/gʌl/	['gʌl]		'no'	
/mʌku/	['mʌku]		'cold'	
/pař/	['pař]	['p <sup>h</sup> ař]	'coconut shoot'	
/nam/	['nam]		'raw'	
/mis/	['mis]		'1st person plural, 3rd person plural (masculine) cry'	
/minik/	['mi <sup>ə</sup> nø <sup>k</sup> ]		'true'	
/kʌn/	['kʌn]	['gʌn]	'boy'	
/yi řʌʔ/	['yi 'řʌʔ]		'I stand up'	
/gʌpři/	['gʌpři]	['gʌbři]	'mouth'	
/yaw/	['yaw]		'leg'	
/piʔagiginti/	[bøʔage'ginti]		'I will build'	

#### 4.1.2 Across Syllable Boundaries

There are no geminate consonant clusters.

/p/ occurs first in cluster with /r/ and /l/.

/gʌpři/	['gʌpři]	['gʌbři]	'mouth'
/sikʌm 'kʌnʌʔ kuplʌn/			
	['sikʌm 'kʌnʌʔ 'køplʌn]		
	['sikʌm 'gʌnʌʔ 'gøplʌn]		'six'

/t/ occurs first in cluster with /w/.

/patwa /	['patwaŋ]	['p <sup>h</sup> at <sup>h</sup> waŋ]	'blow'
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/k/ occurs first in cluster with /r/, /l/ and /w/.

/nikři/	['nikři]	'sap'
/wıklag/	['wıklag]	'bamboo'
/gimikwag/	['gimək'wag]	'I am falling'

/ʔ/ occurs first in cluster with /t/ and /k/.

/tuʔtuʔ/	['tuʔtuʔ]	['t <sup>h</sup> uʔt <sup>h</sup> uʔ]	'talk', 'custom'
/sikam kʌnʌʔkʌplʌn/	['sikʌm 'kʌnʌʔkʌplʌn]	['sik <sup>h</sup> ʌm 'gʌnʌʔgʌblʌn]	'six'

/p/ occurs first in cluster with /n/, /l/ and /r/.

/wʌpnimɪn/	['wʌpnə'mɪn]	'morning'
/nɪplʌy/	['nəp'lay]	'sky, cloud'
/wʌplɪg/	['wʌpli <sup>θ</sup> g]	'sun'
/nɪpři/	['nəp'ři]	'star'
/gʌpři/	['gʌpři]	'yam'

/g/ occurs first in cluster with /l/ and /y/.

/tiglɪg/	['tiglɪg]	'hill'
/gɪgyam/	['gɪgyam]	'I know', 'I perceive'

/m/ occurs first in cluster with /p/, /t/ and /n/.

/tʌmpay yʌp/	/tʌmpɛy yʌp/	['tʌmpay 'yʌp]	
		['tʌmbay yʌp]	['t <sup>h</sup> ʌmpɛy 'yʌp]
		['t <sup>h</sup> ʌmbeɪ 'yʌp]	'yourself'
/nɪmpʌɾ/	['nɪmpʌɾ]	['nɪmbʌɾ]	'pitpit'
/namtak/	['namtʌ <sup>k</sup> ]		'swallow'
/gʌmti/	['gʌmti]		'I cry'
/gʌmni/	['gʌmni]		'sago roofing'

/n/ occurs first in cluster with /t/, /k/ and /p/.

/kintuʔʌl/	['kɪntuʔʌl]		'stream'
/pʌnkalu/	['pʌnka'lu]	['pʌŋka'lu]	
	['p <sup>h</sup> ʌnka'lu]	['p <sup>h</sup> ʌŋga'lu]	'fingers (plural)'
/gʌnpʌp/	['gʌnpʌp]	['gʌnp <sup>h</sup> ʌp]	'one'

/gʌŋpi/	['gʌŋpi]	['gʌŋp <sup>h</sup> i]	'coconut'
* /mʌŋpaɸ̄/	['mʌŋbaɸ̄]	['mʌŋpaɸ̄]	'lizard'

/n/ occurs first in cluster with /k/.

/wiŋkinik/	['wiŋk <sub>1</sub> nə <sup>k</sup> ]	['wiŋk <sub>1</sub> nə <sup>k</sup> ]	'elbow (plural)'
/puŋkʌnik/	['pʊŋkʌnə <sup>k</sup> ]	['bʊŋkʌnə <sup>k</sup> ]	'wrist'

/l/ occurs first in cluster with /p/, /t/. /k/, /p/, /g/, /m/ and /w/.

/gʌlpku/	['gʌlpa'ku]	['gʌlba'ku]	'mumut'
/walpin/	['walpi <sup>ə</sup> n]	['walbi <sup>ə</sup> n]	'drip'
/liŋiltɛki/	['liŋəl'tɛ'ki]		'jaw, chin'
* /matilk(w)uk/	['mat <sub>1</sub> l'k(w)ɔ <sup>k</sup> ]	['mat <sup>h</sup> <sub>1</sub> l'k(w)ɔ <sup>k</sup> ]	'edible leaf (type)'
/walkikal/	['walk <sub>1</sub> 'kal]		'chicken (plura;)'
/wʌʔʌlpi/	['wʌʔlpi]		'drum', 'kundu'
/lupalgu/	['lupal'go]		'stump of a tree (plural)'
/sʌlmaniɸ̄/	['sʌlma'nɪŋ]		'sand, beach'
/nalwuwaw/	['nalwu'waw]		'3rd person singular (masculine) move'

/ɸ̄/ occurs first in cluster with /k/. /p/, /s/ and /w/.

/pʌɸ̄kʌn/	['pʌɸ̄kʌn]	['bʌɸ̄gʌn]	'she'
/taɸ̄pin/	['taɸ̄pi <sup>ə</sup> n]	['t <sup>h</sup> arp <sup>h</sup> i <sup>ə</sup> n]	'soft'
/naɸ̄suɸ̄suɸ̄/	['naɸ̄siɸ̄'suɸ̄]		'move, flow (water)'
/wuɸ̄watuwan/	['wuɸ̄'watu'wan]		'3rd person singular (feminine) chase'

/y/ occurs first in cluster with /p/, /r/, /g/

/naʔaypʌpi/	/naʔɛypʌpi/	[na'ʔaybʌ'bi]	
		[na'ɛypʌ'pi]	['naybʌ'bi] ['nɛypʌ'pi] 'many plenty'
/yaʔayɸ̄am/	/yaʔɛyɸ̄am/	['yaʔayɸ̄am]	
		['yaʔɛyɸ̄am]	'father (plural)'

\* Uncertain

/w/ occurs first in cluster with /k/

/sawkɛy/    ['sawkɛy]    ['saw<sup>h</sup>ɛy]    'smoke (tobacco)'

## 4.2 Vowels

### 4.2.1 Within the syllable

All vowels occur in peak slots of CV and CVC syllables.

/sik/	['sɪ <sup>k</sup> ]	'spear'	
/wɪg/	['wɪg]	'bush'	
/sik/	['sɪ <sup>ə</sup> k]	'hand'	
/pik/	['pɪ <sup>ə</sup> k]	'yesterday'	
/luɾ puɾ/	['luɾ 'puɾ]    ['luɾ buɾ]	'sago palm leaf'	
/luk/	['lu <sup>ə</sup> k]    ['lɔ <sup>ə</sup> k]	'sago (plural)'	
/sek/	['sɛ <sup>ɪ</sup> k]    ['sɛ <sup>k</sup> ]	'bananas (plural)'	
/mek/	['mɛ <sup>ɪ</sup> k]    ['mɛ <sup>k</sup> ]	'sap of breadfruit tree'	
/sʌʔ/	['sʌʔ]	'pig'	
/wʌɾ/	['wʌɾ]	'3rd person singular (feminine) stand up'	
/sag/	['sag]	'banana (singular)'	
/maʔ/	['maʔ]	'milk'	
/mitig/	[mɛ <sup>ə</sup> 'tɪg]    ['mɛ <sup>ə</sup> t <sup>h</sup> ɪg]	'wife'	
/paligi/	['pʌlɛ <sup>ə</sup> 'gi]    ['p <sup>h</sup> ʌlɛ <sup>ə</sup> 'gi]	'(subject person) ... give me'	
/yi/	['yi]	'I',	
/yaʔɛy/	/yaʔay/	['yaʔɛy]    ['yaʔay]	'father'
/mʌku/	['mʌku]    ['mʌk <sup>h</sup> u]	'cold'	
/nuwey/	['nuwey]	'on top of'	
/meliʔmeliʔ/	['mɛli <sup>ə</sup> ʔmɛli <sup>ə</sup> ʔ]		
	['mɛleʔ'mɛleʔ]    ['mɛliʔ'mɛliʔ]	'slowly'	
/beyis/	/bayis/	['beyis]    ['bayis]	'big'
/nʌmɪk/	['nʌ <sup>k</sup> ɪ]	'eye'	
/pʌkim/	['pʌkɛ <sup>h</sup> ɪm]    ['p <sup>h</sup> ʌk <sup>h</sup> ɪ m]	'full'	

## 4.2.2 Across syllable boundaries

There are no vowel clusters. (See Alternative Analysis, Section 8.2.)

## 5 SUPRASEGMENTAL ITEMS

## 5.1 Stress

Stress tends to occur on the first and every alternate syllable.

/sig/	['sig]		'leaf'
/sag/	['sag]		'banana'
/nʌmik/	['nʌmɪk]		'eye'
/gʌŋpi/	['gʌŋpi]	['gʌŋp <sup>h</sup> i]	'coconut'
/paliɡi/	['pələ'gi]	['p <sup>h</sup> ələ'gi]	'(subject person) give me'
/tapapi/	['daba'bi]	['taba'bi]	'small, few'
/misiwʌniŋ]	['misi'wʌnəŋ]		'woman'
/liɡiltɛki/	['liɡəl'tɛ <sup>i</sup> ki]		'jaw, chin'

There are a few two syllable words where the stress seems to be on the second syllable.

/gʌřig/	[gʌ'řig]		'head'
/pilig/	[pə'lig]	[bə'lig]	'cheek'
/niṗři/	[nəp'ři]		'star'
/niṗlay/	[nəp'lay]		'sky, cloud'

When there is a prefix added, stress may be on the second syllable.

/pəwɛgʌř/	[pə'wɛgʌř]	[p <sup>h</sup> ə'wɛ <sup>i</sup> gʌř]	'tame'
		(possessive prefix 'pə')	

## 6 MORPHOPHONEMIC RULES

Nasals tend to assimilate to the same point of articulation as the following stop. However, there appears to be some fluctuation and some exceptions.



/lumpɪlu/	['lumpə'lu]	['lumbə'lu]	'3rd person plural (feminine) go'
/yi gampin/	['yi 'gamb <sub>ɪ</sub> n]	['yi 'gamp <sub>ɪ</sub> n]	'1st person singular come.
/gʌŋku/	['gʌŋku]	['gʌŋgu]	'1st person singular eat'
/namɪŋkʌɾ/	['naməŋ'kʌɾ]	['naməŋ'gʌɾ]	'ant'
/yi gɪm <sub>ɪ</sub> ŋkɪtə 'ti/	['yi'gə'm <sub>ɪ</sub> ŋkɪtə'ti]		'1st person singular
/g <sub>ɪ</sub> ŋkiɾi/	['g <sub>ɪ</sub> ŋgə'ɾi]		'centipede'
/ɾaŋkɪtanɪk/	['ɾaŋgə'tanə <sup>k</sup> ]		
	['ɾaŋkə't <sup>h</sup> anə <sup>k</sup> ]		'feather (plural)'
/wiŋkinɪk/	['wɪŋg <sub>ɪ</sub> nə <sup>k</sup> ]		'elbow (plural)'
/wupʌm lʌŋkʌm/	['wupʌm 'lʌŋkʌm]		'very dark'
/pʌŋkʌɾ/	['pʌŋkʌɾ]	['pʌŋəkʌɾ]	
	['p <sup>h</sup> ʌŋkʌɾ]	['p <sup>h</sup> ʌŋgʌɾ]	'finger'
/mʌŋpaɾ/	['mʌŋbaɾ]	['mʌŋpaɾ]	'lizard'

## 7 UNRESOLVED ISSUES

7.1 The following words need checking to see whether or not they are exactly the same.

/naʔay/	/naʔey/	['naʔay]	['naʔey]	'mother'
/naʔay/ etc.				'sit'
/naʔay/ etc. is a shortened form of:				
/namʌʔay/	/namʌʔey/	['namʌʔay]		'sit'
		['namʌʔey]		'to be'

7.2 The following words need further checking for possible contrasts.

/wʌlɪk/	['wʌlɪ <sup>k</sup> ]		'fire'
/wʌlɪk/	['wʌlɪ <sup>k</sup> ]		'nail of finger'
/gʌl/	['gʌl]		'no'
/gʌl/	['gʌl]	['gʌ <sup>˘</sup> l]	'type of bamboo'
/yi nagʌl/	['yi 'nagʌl]		'I'm afraid'

Is the following one or two syllables?

['liaĩ] or ['liyaĩ] or ['li<sup>a</sup>ĩ]                      'ginger'  
 /waysan/      ['waysan] 'taro' may be influenced by pidgin.

7.3 We could not find any real contrasts between /p/ and /ʔ/, or between /t/ and /ʔ/.

7.4 There are no unambiguous CC patterns. Yet there are certain words which do not fit into the CV or CVC patterns.

['saŋgrʌŋ]	'type of banana (singular)'
['saŋgrʌŋ <sup>k</sup> ]	'type of banana (plural)'
['nalʌŋlʌl]	'dry'
['plʌkĩi]	'type of bird'
['siyu'wʌnəŋg]	'girl'
['wipə'lʌŋ <sup>k</sup> ]	'(small) banana (plural)'
['bays] ['beys]	'big'
[sawkaŋ <sup>k</sup> ]	'smoke (tobacco)'
['lɪklə'yɪŋ <sup>k</sup> ]	'type of bird (plural)'
[bɪ'biŋ <sup>k</sup> ]	'white ant (plural)'
['su <sup>ə</sup> lʌŋ <sup>k</sup> ]	'poisonous snake (plural)'
['yatʌ'nəŋ <sup>k</sup> ]	'fly (plural)'
['mat{l'kwɔ <sup>k</sup> ]	'edible leaf'
[wumiŋg]	'type of bird'

7.5 We are still uncertain as to whether [ə] really occurs in some words or whether it is merely a transition across syllable boundaries. e.g. /pʌŋkaĩ/    ['pʌnəkai]    [pʌŋgaĩ]

It could be that other phonemes tend to become [ə] in fast speech. We are still doubtful as to whether /i/ does become [ə] in all unstressed syllables or whether it fluctuates. Further checking is necessary.

[bɪ'biŋ <sup>k</sup> ]	'white ant'
['yatʌ'əŋ]	'fly'
[pʌkəm] [pʌkim]	'full'

[bə'liŋ]		'cheek'
[gʌ'rɪŋ]		'head'
['niŋiĩ]		'fish'
['giĩin]	['giĩən]	'I look (1st person singular)'
['kəpił]		'rubbish hole'
['wugiĩ]		'rat (singular)'
['wusi'kal]		'rat (plural)'
['namiŋgiĩ]		'spider'
[yuliłk]		'pupil (of eye)'
[wumiŋŋ]		'type of bird'
['yi ɡapiŋɔł]		'(1st person singular) laugh'
[yuliŋgiĩ]		'fruit'
['nəmiin]	['niimɪn]	'inside, middle'

7.6 There is probably another phoneme o or ɔ. However, the only contrast we have is ['lo<sup>ək</sup>] ['lu<sup>ək</sup>] 'sago (plural)' and ['lo<sup>k</sup>] 'mangas'. These words need to be carefully checked. /u/ fluctuates with (o) sometimes, but does not appear to in some environments. We have not been able to isolate these environments.

It seems that there is some fluctuation from /u/ to [v] in all the back rounded vocoids. Like /ɛ/, the vocoid [ɔ] or [o], if it exists as a separate phoneme, is not as common as the high and central columns, i.e. /i/, /i/, /u/. and /i/, /ɔ/, /a/.

['suwɔkɔ <sup>u</sup> ]		'smoke (tobacco)'
['bɔ <sup>u</sup> ]	['bo]	'long way', 'that'
['wiĩ <sup>u</sup> ]	['wiĩo <sup>u</sup> ]	'hole (plural)'
['tuʔu]	['tuʔo <sup>u</sup> ]	'garden', 'lime'
['gabĩo]	['gabĩo]	'bird (plural)'
['bl kro]	['bl kr w]	'type of bird'
['naʔɔ'lo <sup>u</sup> ]		'grasshopper (plural)'
['lo <sup>ək</sup> ]	['lu <sup>ək</sup> ]	'sago (plural)'
[ta'toʔup]	[to <sup>u</sup> p]	'today, now', 'today, only'
['laʔa'lu]	['laʔa'lo]	'mushroom', 'beard'

['io <sup>u</sup> ]	['lu]	'tree'
['pa <sup>o</sup> ]	['pa <sup>o</sup> w]	'dog (plural)'
['lip <sup>o</sup> w]		'lips (plural)'
['luw <sup>o</sup> w]		'frog (plural)'
['suw <sup>o</sup> u]		'thigh'

## 8 ALTERNATIVE ANALYSIS

8.1 The /a/ and /ʌ/ distinction could alternatively be interpreted as length. However, we have little evidence of length elsewhere.

/lumpɪlu/	['lumpə'lu]	['lumbə'lu]	'3rd person plural (feminine) go'
/malu/	['malu]	['malu]	'carrier for baby'

These are about the only two examples we have. We have not found contrastive length elsewhere.

The second reason why we chose the lower/higher distinction is because it occurs in related languages, whereas length has not been found.

8.2 /y/ and /w/ may alternatively be interpreted as /i/ and /u/ respectively.

/patwaŋ/	/patuaŋ/	['patwaŋ]	[p <sup>h</sup> at <sup>h</sup> waŋ]		
		['patuaŋ]	[p <sup>h</sup> at <sup>h</sup> uaŋ]	'blow'	
/yaw/	/yau/	['yaw]	['yɔw]	['yau]	'leg'
* (check)	[lia <sup>ɾ</sup> ]	['li <sup>a</sup> ɾ]	['liya <sup>ɾ</sup> ]		'ginger'
/pay/	/pey/	/pai/	/pei/	['pay]	['pey]
	['pai]	['pey]	['bay]	['beɪ]	
	['bai]	['bei]			'you (singular)'

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