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The phonology of Proto-Central Chadic : the reconstruction of the phonology and lexicon of Proto-Central Chadic, and the linguistic history of the Central Chadic languages

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Section I - BACKGROUND

1 Introduction

1.1 Goals

The goal of this study is to reconstruct the phonology of Proto-Central Chadic. Central Chadic is a language group spread across Chad, Cameroon and Nigeria and is a primary branch of the Chadic language family within the Afroasiatic phylum of languages. It is characterised by a high degree of phonological diversity, much higher than within the other branches of Chadic. Previous reconstructions of Chadic or its branches have focussed on the consonantal system. Here we will also tackle what may loosely be called the vowel system. The result is a reconstruction of the sound system of Proto-Central Chadic (though not including tone or stress), and of the daughter languages of Proto-Central Chadic, the ancestors of the present day groups of Central Chadic languages. The study includes a detailed sub-classification of the Central Chadic languages, and the reconstruction of more than two hundred lexical items.

In general, the Central Chadic languages are described as possessing very few underlying vowels, typically two, but in some cases just one (Barreteau 1988; Bow 1999). However the number of surface vowels is often considerably higher. There are two principal causes for this. Firstly, labialized and palatalized consonants play an important role in modifying the underlying vowels. Secondly, word-level vowel-harmony can cause the fronting or back-rounding of vowels throughout a word.

In the languages where vowel harmony is present, it is analysed as being caused by a phonemic entity known in Chadic linguistics simply as a 'prosody'. In this study we will show that there are languages where the palatalization of consonants is also due to the presence of a prosody.

From this basis we will categorise the Central Chadic languages typologically as following one of four phonological systems. The first is the Vowel Prosody system, where the predominant feature is the presence of vowel harmony. The second is the Consonant Prosody system, where the languages possess large sets of palatalized and labialized consonants. The third system is the Mixed Prosody system, where features of both Vowel Prosody and Consonant Prosody are present, and the fourth system is the Kotoko system, where there are no active prosodies.

In the Central Chadic languages, as well as in the history of Central Chadic languages, there is a strong interplay between the vocalic, consonantal and prosodic systems. Before any comparative analysis can be done, it is essential that the roles of these three components are understood in the individual languages.

Our task, then, is not only to reconstruct the underlying vowels and consonants of Proto-Central Chadic, but also to reconstruct the history of labialized and palatalized consonants, along with the palatalization and labialization prosodies.

There are several important results that come out of the study. The first is the reconstruction of a palatalization prosody for Proto-Central Chadic that has reflexes that cause front vowel harmony in Vowel Prosody languages and palatalize consonants in Consonant Prosody languages (see chapter 11).

The second is to show that back-rounding vowel harmony and the labialization of labial consonants are not due to the existence of a Proto-Central Chadic labialization prosody, but are of comparatively recent origin, and are the result of processes that have affected labialized velars.

A third result is the reconstruction of three underlying vowel phonemes for Proto-Central Chadic. This system was largely preserved in the Consonant Prosody Languages, but was reduced to a two vowel system in the Vowel Prosody languages.

This study is divided into three sections. The first section gives the background to the languages and peoples, the research carried out to date, the theoretical issues important to the study, and the areal and genetic groupings that are important in the history of Central Chadic languages.

The second section describes the phonologies of the different Central Chadic languages, grouped under four different phonological types. It also establishes the broad phonological characteristics of the ancestor languages of the different groups within Central Chadic, constituting an intermediate step between Proto-Central Chadic and the present day languages.

The third section presents the reconstruction of the phonological system of Proto-Central Chadic. This includes the reconstruction of the consonantal, vocalic and prosodic systems.

Full data for the reconstructions used in the analysis can be found at <http://centralchadic.webonary.org/>, and a summary of the Proto-Central Chadic lexicon can be found at <http://protocentralchadic.webonary.org/>.

1.2 Methodology

The methodology used here follows the well-established comparative method (Bynon 1977; Campbell 2004; Crowley and Bowerman 2009). The first stage is to inspect the data from the languages under study and to identify words with similar meaning and form, i.e. apparent cognates. When a good number of apparent cognates has been found, the data is again inspected to identify regular sound correspondences between groups of languages. For example, one group of languages may have /n/ in all the apparent cognates, whereas another group has /r/ in the same place in the word. These regular correspondences serve to establish four things. Firstly, they provide evidence that the apparent cognates are genuinely cognate and not just chance similarities. Secondly, they allow for the proposal of rules for regular historical sound changes. For example we may propose that the ancestor language had *n, but that there was a change *n→r in one group. Thirdly, they allow us to group languages that have a shared linguistic history on the basis of these shared innovations, i.e. the languages that have /r/ share a common ancestor, but we cannot say the same for the languages with /n/ as there is no shared innovation. Fourthly, the cognates together with the corresponding rules for sound changes allow for the reconstruction of the forms of the words in the ancestor language.

This is a very simplified summary of the method, and there are many pitfalls to be avoided. Loanwords may show correspondences that are not there in the indigenous vocabulary, language contact can spread phonological changes between languages that are not directly related, and identical sound changes can occur independently in different languages implying a relationship that doesn't exist. Where a sound change is used to justify a genetic grouping, it is also necessary to look at the degree of similarity of the lexicons of the languages involved and to consider the likely history of the people groups involved in order to establish that the genetic grouping is plausible. If several highly similar neighbouring languages share a sound change, it is likely to be evidence of genetic affiliation. If dissimilar languages hundreds of kilometres apart share a sound change, this is more likely to be due to chance. Ideally, genetic groupings should be supported by several sound changes, and these should be found in a good number of core lexical items.

Following this method gives four results: a lexicon of reconstructed forms for the proto-languages; a set of regular sound changes linking different historical stages of the language; a classification of the languages based on shared innovations; a reconstruction of the phonemic inventory of the proto-language. (It should be noted that the reconstructed inventory is phonemic rather than phonetic, though in most cases the phonetic realisations can be deduced.)

For this particular study there are two important methodological considerations. Firstly, the reconstructions are made based on at least two layers of history. Reconstructions are made for each group within Central Chadic, and then these are used to reconstruct the form for Proto-Central Chadic. In some cases it is possible also to reconstruct forms for the proto-languages of sub-groups within a group, or of the proto-language of a major group that was ancestral to a number of groups.

The second consideration is that the analysis must be made on the basis of a deep analysis of the underlying forms of the words in the individual languages. Examining the surface segments is inadequate for establishing regular correspondences and sound changes, particularly for Central Chadic vowels (Wolff 1983a). Only by working from the underlying segments and prosodies is it possible to understand the historical processes involved.

For example, the following table gives some sample phonetic data for the word 'nose'.

Language	Surface Form
Zulgo	hitir
Merey	həter
Ouldeme	hu ⁿ dar
Malgwa	əktare
Dghwede	xtire
Hdi	hətsiŋ
Vame	hətʃeŋ
Bana	kʃən
Jimi	ʃən-ən
Sukur	ʃin

Table 1- Sample cognates of the root 'nose'

We can see variations in the consonants, with the initial consonant having as reflexes [k], [x], [h] or zero, the middle consonant having the reflexes [t], [n^d],

[ts], [tʃ] or [ʃ], and the final consonant having the reflexes [r], [n] or [ŋ]. With the vowels, the surface forms vary between [e], [i], [a], [u], [ə] and zero, and it is not clear either where the vowels should be placed, or how many there should be in the proto-form.

A phonemic representation of Table 1 by contrast looks as in Table 2, from which the Proto-Central Chadic root for ‘nose’ can be reconstructed as *h^witsin^y. (The superscript ^y represents the palatalization prosody.)

Language	SF	UF
Zulgo	hitir	hitir ^y
Merey	həter	hitar ^y
Ouldeme	hu ⁿ dar	h ^w i ⁿ dar
Malgwa	əktare	iktari
Dghwede	xtire	xtiri
Hdi	hətsiŋ	hətsin
Vame	hətʃeŋ	hətsan ^y
Bana	kʃən	ks ⁱ ən
Jimi	ʃən-ən	sin ^y
Sukur	ʃin	sin ^y

Table 2 - Sample phonemic forms for ‘nose’

This palatalization prosody has different effects in different languages. In some it fronts some or all of the vowels of the word (Zulgo, Merey), in others it palatalizes certain consonants (Jimi, Sukur), and in some it does both (Vame). In some languages the palatalization prosody is no longer a word-level feature, but is frozen in a vowel (Dghwede, Hdi) or a consonant (Bana). In addition, many languages have a phrase-final vowel lowering rule (Merey, Malgwa, Dghwede, Vame).

Simple comparison of the surface segments will therefore not yield the correct reconstruction. Only a deep phonemic analysis is able to reveal the phonemic form of the root. Unfortunately, neither of these will be able to tell us for sure what the original surface form of *hitsin^y actually was! We can deduce the presence of the palatalization prosody, but only guess at its effect.

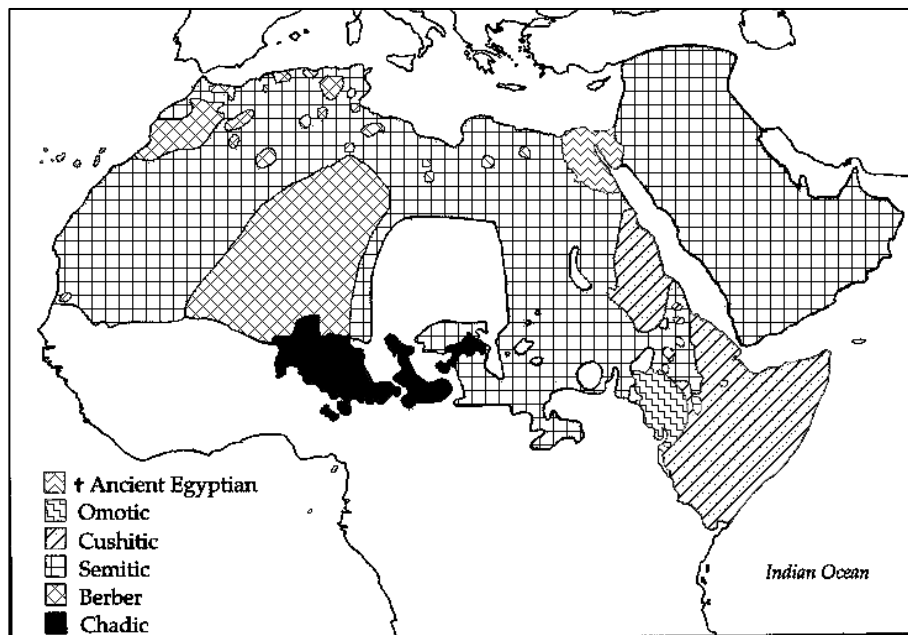
It should also be remembered that language contact plays a major role in how languages change. The Central Chadic region is densely populated with people and languages, and has been the site of many migrations (see section 3.5). Words, sounds and phonological processes have all been borrowed and spread

between languages. In this study we will also be taking into account the influence the languages have had on each other, as well as the influence from non-Chadic peoples.

1.3 The Languages and Peoples

Chadic is one of the six families within the Afroasiatic family, alongside Cushitic, Omotic, Semitic, Egyptian and Berber. More than half of the Afroasiatic languages spoken today are Chadic languages. The Ethnologue (Lewis 2009) lists 195 Chadic languages, of which 78 are Central Chadic (called Biu-Mandara in the Ethnologue and by certain authors).

The following map shows the present-day distribution of the branches of Afroasiatic.



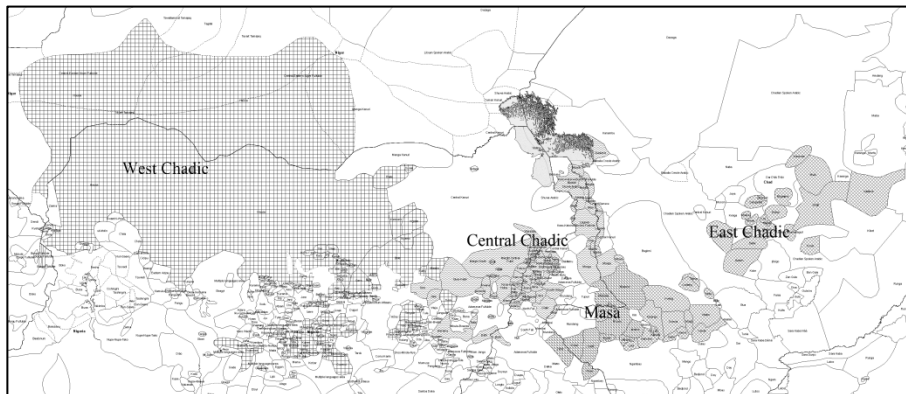
Map 1 - Chadic and Afroasiatic (Starostin 2008)

Central Chadic is one of the four branches of the Chadic language family, with the others being West Chadic, East Chadic and Masa. (Some scholars, beginning with Jungraithmayr and Shimizu (1981), prefer to treat the Central Chadic and

Masa branches as a single branch, though Shryock (1990) provides convincing arguments against this.)

The Central Chadic or Biu-Mandara languages are spoken in an area covering north-eastern Nigeria, the north of Cameroon and the western edge of Chad. This area is within the Sahel, the region of Africa just to the south of the Sahara desert.

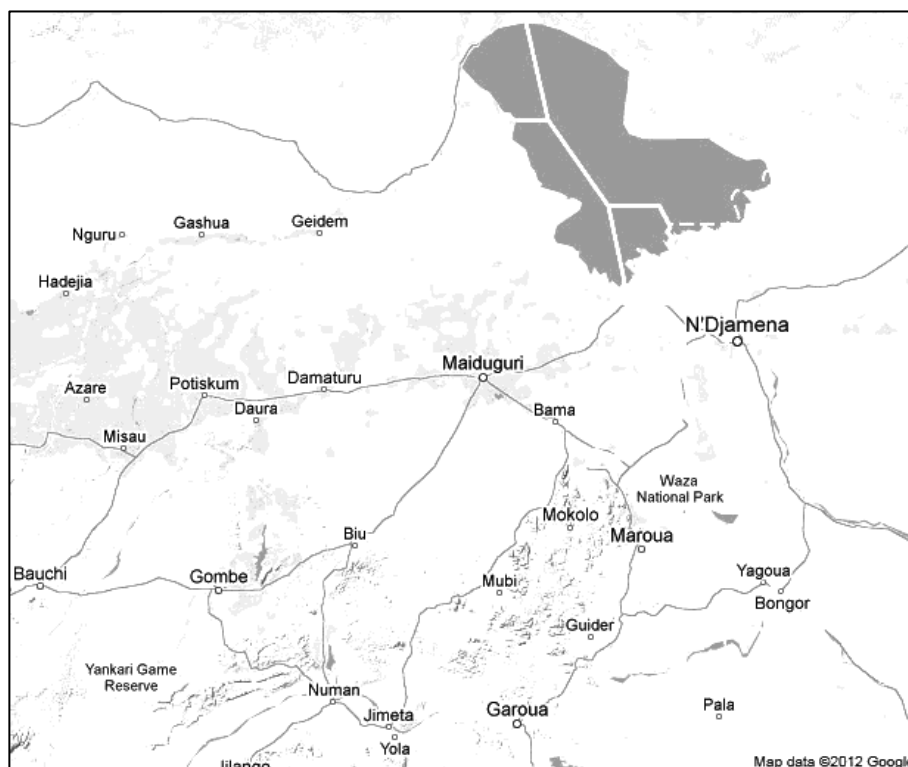
The following map shows the current locations of the languages of the four branches.



Map 2 - The branches of Chadic

The Central Chadic region can be divided between three different ecological environments which are significant for the linguistic history of the region. The first is the Mandara Mountains, a range of mountains up to 1,500m high in the western part of northern Cameroon, located to the north and south of a line between Maroua and Mokolo. This area has higher rainfall than the surrounding land and is more densely populated. The second environment is the grassland areas to the west and east of the Mandara Mountains. Thirdly there are the riverain areas around the south of Lake Chad and along the Logone and Chari rivers along the Cameroon-Chad border. (Lake Chad is one of the largest lakes in Africa. The lake expands considerably during rainy season, and then contracts during dry season. The Logone and Chari rivers flow in to Lake Chad, but there is no river flowing out of the lake; water loss is entirely due to evaporation.)

The following map shows the geography of the region within which the Central Chadic languages are spoken.



Map 3 - Modern map of the Central Chadic region

1.4 Sources and Conventions

The data used in this study comes in a wide variety of forms. At one end there are published reference grammars and dictionaries produced by linguists, either from the region itself or from overseas. At the less formal end we have word lists and dictionaries collected by local people with little or no linguistic training, or by priests, anthropologists and other interested expatriates who not have any linguistic training. In between we have a number of unpublished wordlists collected by linguists, and various phonologies or academic articles on the languages that contain useful data.

In this study, I have mostly disregarded ‘historic’ data from early European explorers, and the more casual wordlists such as the Chadic Wordlists (Kraft 1981), the ALCAM data (Dieu and Renaud 1983) and data from SIL surveys. These wordlists were often collected in a very short time, and were not backed up by testing or phonological research. When compared with the data from longer term studies, there are numerous transcription errors. However, these sources are occasionally used alongside more reliable data to support a reconstruction.

The data varies not only in quality but also in type. Some is raw phonetic data, some is phonemic and some is orthographic. A number of different phonetic or orthographic systems are used in the sources. Here we will present the data using IPA symbols for clarity. The type of data is denoted by the standard conventions of [...] for phonetic, /.../ for phonemic and ‘...’ for orthographic, or by the column headings in tables. Reconstructed forms and phonemes are preceded by an asterisk *. Any reconstructions or underlying forms given that are not credited are my own. Surface forms given use a broad phonetic transcription.

The lexical data sources used are given in the following table. Phonological studies will be referenced in the sections on the individual languages. The present study includes data from 60 of the 78 Central Chadic languages listed in Lewis (2009), together with data from six varieties treated as dialects in Lewis (2009), which amounts to 66 varieties used in this study. For ease of reference, the language names used are mostly those given in the Ethnologue 16th Edition (Lewis 2009). The exceptions are Bachama for Bacama, Margi for Margi Central, Mbazla for Baldemu, Ouldeme for Wuzlam, Bura for Bura-Pabir, Mabas for Vemgo-Mabas, Zina for Jina, Mazera for Majera, Maltam for Maslam and Kilba for Huba. Some varieties not listed in the Ethnologue as separate languages are included, namely Gemzek and Zulgo (in the Ethnologue as Zulgo-Gemzek); Higi, Kamwe-Futu, Kamwe-Nkafa (Kamwe); Malgwa (Mandara); and Musgum, Mulwi, Vulum, Munjuk (Musgu).

The following table lists all the Central Chadic languages listed in the Ethnologue (including the varieties just mentioned) and the data sources (where available).

Language [code]	Group	Source	Type
Afade [aal]	Kotoko North	(Allison n.d.)	Word list (unpublished)
Bachama [bcy]	Bata	(Seibert n.d.)	Word list (unpublished)
Bana [bcw]	Higi	(Lienhard and Giger 1989)	Lexicon (unpublished)
Bata [bta]	Bata	(Boyd 2005)	Lexicon (unpublished)
		(Pweddson and Skinner 2001)	Dictionary
Boga [bvaw]	Tera	none	
Buduma [bdm]	Kotoko Island	(McKone 2009)	Lexicon (unpublished)
Bura [bwr]	Margi	(Blench 2009a)	Dictionary (unpublished)
		(Schuh n.d.)	Word list (unpublished)
Buwal [bhs]	Daba	(Viljoen and Viljoen in progress)	Lexicon (unpublished)
Cibak [ckl]	Margi	(Hoffmann 1955)	Linguistic article
Cineni [cie]	Mandara	none	
Cuvok [cuv]	Mafa	(Ndokobaï in progress)	Lexicon (unpublished)
Daba [dbq]	Daba	(Lienhard and Giger 1982)	Dictionary
Dghwede [dgh]	Mandara	(Frick 1977)	Linguistic article
Dugwor [dme]	Mofu	(Gravina and Jubumna 2004)	Word list (unpublished)
Fali [fli]	Bata	none	
Ga'anda [gqa]	Tera	(Ma Newman 1978)	Word list (unpublished)
Gavar [gou]	Daba	(Viljoen and Viljoen in progress)	Word list (unpublished)
Gemzek [gnd]	Mofu	(Gravina, Sabathai, and Gwala-Madang n.d.)	Word list (unpublished)

Language [code]	Group	Source	Type
Gidar [gid]	Gidar	(Schuh 1982)	Word list
		(Hungerford n.d.)	Word list (unpublished)
		(Noukeu 2002)	Linguistic article
Giziga North [gis]	Maroua	(Gravina 2004)	Word list (unpublished)
Giziga South [giz]	Maroua	(Michielan and Jaouen n.d.)	Dictionary (unpublished)
Glavda [glw]	Mandara	(Rapp and Benzing 1968; Rapp and Muehle 1969)	Dictionary
		(Owens n.d.)	Word list (unpublished)
		(Nghagyiva n.d.)	Database
Gude [gde]	Bata	(Hoskison 1983)	PhD Thesis
		(Schuh n.d.)	Word list (unpublished)
Gudu [gdu]	Bata	none	
Guduf-Gava [gdf]	Mandara	none	
Gvoko [ngs]	Mandara	none	
Hdi [xed]	Lamang	(Bramlett 1996)	Lexicon
		(Eguchi 1971)	Lexicon
Higi [hig]	Higi	(Mohrlang 1972)	Phonology
Holma [hod]	Bata	none	
Hwana [hwo]	Tera	(Harley n.d.)	Word list (unpublished)
Hya [hya]	Higi	none	
Jara [jaf]	Tera	none	
Jilbe [jie]	Kotoko	none	
Jimi [jim]	Bata	(Djibi n.d.)	Dictionary (locally published)
Kamwe Futu [hig]	Higi	(Harley 2009a)	Word list (unpublished)
Kamwe Nkafa [hig]	Higi	(Harley 2009b)	Word list (unpublished)
Kilba [hbb]	Margi	(Schuh n.d.)	Word list (unpublished)
Kirya [hig]	Higi	(Blench and Ndamsai 2009a)	Dictionary (unpublished)

Language [code]	Group	Source	Type
Kofa [kso]	Margi	none	
Lagwan [kot]	Kotoko Centre	(Shryock n.d.)	Database
Lamang [hia]	Lamang	(Wolff n.d.)	Word list (unpublished)
Mabas [vem]	Lamang	none	
Mada [mxu]	Mofu	(Barreteau and Brunet 2000)	Dictionary
		(Nkoumou and Telemnke 2003)	Dictionary
Mafa [maf]	Mafa	(Barreteau and le Bléis 1990)	Dictionary
Malgbe [mxf]	Kotoko North	(Allison n.d.)	Word list (unpublished)
Malgwa [mfi]	Mandara	(Löhr 2005)	Lexicon (unpublished)
Maltam [msv]	Kotoko North	(Allison n.d.)	Word list (unpublished)
Mandara [mfi]	Mandara	(Fluckiger and Whaley n.d.)	Lexicon (unpublished)
Margi [mrt]	Margi	(Hoffmann 1963)	Grammar
Margi South [mfm]	Margi	(Harley n.d.)	Word list (unpublished)
Matal [mfh]	Mandara	(Branger in progress)	Word list (unpublished)
Mazagway [dkx]	Daba	(Noussi n.d.)	Word list (unpublished)
Mazera [xmj]	Kotoko South	(Allison n.d.)	Word list (unpublished)
Mbara [mpk]	Musgum	(Tourneux, Seignobos, and Lafarge 1986)	Word list
Mbazla [bdn]	Maroua	(Seignobos and Tourneux 1984; Tourneux 1987)	Word list
Mbudum [xmd]	Daba	(Ndokobaï in progress)	Lexicon (unpublished)
Mbuko [mqb]	Hurza	(Gravina in progress)	Dictionary (unpublished)
Mefeke [mfj]	Mafa	none	

Language [code]	Group	Source	Type
Merey [meq]	Mofu	(Gravina and Doumok in progress)	Lexicon (unpublished)
Mina [hna]	Daba	(Frajzyngier, Johnston, and Edwards 2005)	Grammar
Mofu North [mfk]	Mofu	(Barreteau and Hollingsworth 1990)	Lexicon (unpublished)
Mofu-Gudur [mif]	Mofu	(Barreteau 1988)	Dictionary
		(Hollingsworth and Hollingsworth 2009)	Dictionary
Moloko [mlw]	Mofu	(Friesen and Starr n.d.)	Lexicon (unpublished)
Mpade [mpi]	Kotoko North	(Allison n.d.)	Lexicon (unpublished)
Mser [kqx]	Kotoko North	(Allison n.d.)	Word list (unpublished)
Mulwi [mug]	Musgum	(Tourneux 1978a)	Linguistic article
Munjuk [mug]	Musgum	(Tourneux 1991)	Dictionary
Muskum [mje]	Musgum	(Tourneux 1977)	Linguistic article
Muyang [muy]	Mofu	(T. Smith forthcoming)	Dictionary
Nggwahyi [ngx]	Margi	none	
Ngwaba [ngw]	Bata	none	
Nzanyi [nja]	Bata	none	
Ouldeme [udl]	Mofu	(W. Kinnaird in progress)	Lexicon (unpublished)
Podoko [pbi]	Mandara	(Zagba, Jarvis, and Siddi 1986)	Lexicon
Psikye [kvj]	Higi	(Mazzucci 2006)	Locally published description
Putai [mfl]	Margi	none	
Sharwa [swq]	Bata	(Gravina n.d.)	Lexicon (unpublished)
Sukur [syk]	Sukur	(David 1996)	Word lists
		(Thomas in progress)	Lexicon (unpublished)
Tera [ttr]	Tera	(Newman 1964)	Word list
Tsuvan [tsh]	Bata	(Johnston n.d.)	Word list (unpublished)

Language [code]	Group	Source	Type
Vame [mlr]	Hurza	(W. Kinnaird in progress)	Lexicon (unpublished)
Zina [jia]	Kotoko South	(Schmidt, Odden, and Holmberg 2002)	Word list
Zizilivakan [ziz]	Bata	none	
Zulgo [gnd]	Mofu	(Haller 1986)	Lexicon

Table 3 - Lexical data sources