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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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13 Summary

We have shown that the phonology of Proto-Central Chadic included three vowel phonemes, the palatalization prosody, and a set of consonant phonemes including labialized velar consonants. The reconstructions of a three-vowel system, and of the palatalization prosody, are both new to Chadic studies.

In addition we have seen that Proto-Central Chadic did not have a labialization prosody, or any other labialized consonants apart from the set of labialized velars. Any non-velar labialized consonants and any labialization prosodies came into present day languages through the transfer of labialization from a lost labialized velar.

We can summarise the segmental phonemic inventory of Proto-Central Chadic as follows:

Consonants

	Labial	Alveolar	Laminal	Velar	Labialized Velar
Plosive	p	t	ts	k	k ^w
	(b)	d	dz	g	g ^w
Implosive	ɓ	ɗ			
Fricative		ʃ	s	x	x ^w
	v	ʒ	z	ɣ	ɣ ^w
Nasal	m	n			
Pre-nasalized	^m b	ⁿ d	ⁿ dz	(^ŋ g)	(^ŋ g ^w)
Liquid		r			
Approximant			j		w

Vowels

	Front	Central
High	i	ɨ
Low		a

Prosody

PAL (Palatalization) – realised as the palatalization of the laminal consonants in a word, or if no laminal consonants are present, the fronting of the vowels in the word.

13.1 Summary of sound changes

The following is a summary of the sound changes that have been identified. The full description is in chapter 3. Where no sound changes have been identified for the proto-language of a group (e.g. Proto-Mafa), the proto-language is still listed so that the genetic affiliation of daughter languages is clear.

- *ɬ→ɓ (Proto-Central Chadic South)
 - *ts→t (Proto-Bata)
 - *ɓ→l (Proto-Bata Proper)
 - *r→l (Tsvan)
 - *r→l (Proto-Daba)
 - *n→ŋ word-final (Mbudum)
 - (Proto-Mafa)
 - *r→l, *n→ŋ word-final (Cuvok)
 - *d→∅ word-final (Proto-Tera)
 - Devoicing of obstruents (Proto-East Tera)
 - Voicing of fricatives word-initial (Proto-West Tera)
 - *ts→s (Sukur)
- (Proto-Hurza)
- *r→l, *d→r word medial (Proto-Central Chadic North)
 - *n→r word-final (Proto-Margi-Mandara-Mofu)
 - *d→t word-initial, *z→s, *ɬ→h^j (Proto-Margi)
 - *d→r (Bura)
 - *n→r word-medial, *m→w word-final (Proto-Mandara)
 - *m→w word-initial before a vowel (Proto-Wandala-Dghwede)
 - palatalized alveolar → palatalized velar (Proto-Wandala)
 - *ɣ→h, *ɣ^w→w (Mandara, Malgwa)
 - *ɣ, *ɣ^w→g (Dghwede)

- *r→l (Matal)
- (Proto-Mofu)
 - *v→b, *ɬ→ɓ in palatalized words, *ɣ→g, *ɣ^w→g^w (Proto-Meri)
 - *ɣ→∅, *ɣ^w→w (Proto-Mofu subgroup)
 - (Proto-Tokombere)
 - *ɣ→h, *ɣ^w→h^w (Muyang, Moloko)
 - *l→r word-finally (Moloko)
 - *r→l word-finally (Mada)
- (Proto-Maroua)
 - *n→ŋ word-final (Mbazla, and sporadically in Giziga)
- *ts→t, n→ŋ word-final (Proto-Lamang)
- *d→t word-initial, possible *k^w→g^w (Proto-Higi)
 - *d→r word-final, *l→r (Kamwe, Kirya, Bana)
- *v→f, *z→s (and possible *ɣ→h) (Proto-North Kotoko-Musgum)
 - *s→h, *ɬ→h (Proto-Kotoko Island)
 - (Proto-Kotoko North)
 - *s→j, *ts→s, *g^w/*k^w→g^h (Malgbe)
 - *ts→s (Maltam)
 - *ts→s, *ɬ→f (Mpade)
 - *dz→d, *ts→t (Proto-Musgum)
- *dz→z, *ts→s (Proto-Kotoko Centre)
 - *ɬ→s, widespread *n→r (Mser)
- *ɬ→s (Proto-Kotoko South)
 - *k→h (Zina)
- *v→b word-initial, *dz→z, *ɓ→ɬ, *ts→t (Gidar)

13.2 Lexical Isoglosses

In this section we will examine the cases where more than one root has been reconstructed for a concept. We will look at the distribution of the isoglosses, and discuss what this tells us about the history of the roots and the history of the Central Chadic languages and peoples.

There are a number of concepts where two or more roots are widely attested amongst the Central Chadic languages. These situations show potential relationships between the languages that share the same root. There are a number of possible scenarios for the development of multiple roots.

The first is with core vocabulary items, where there may well have been a Proto-Chadic or Proto-Central Chadic root, but certain languages replaced this with a different root. In these circumstances we can deduce either an areal or a genetic relationship between the languages that took on the new root, but we cannot deduce any specific relationship between those languages that retained the Proto-Central Chadic root.

The second scenario is with the introduction of words for new concepts. For instance, the numerals between five and ten are unlikely to have existed in Proto-Chadic or Proto-Central Chadic, but were introduced at a time after Proto-Central Chadic has split into different daughter languages when words became required for these concepts. In these cases, we can deduce a relationship between the languages that share each root, but again the link could be areal or genetic.

A third scenario is where a new 'technology' is introduced. This could cover anything from growing millet or keeping sheep to the use of hoes or terracing. In these cases, the words are often borrowed in from the language of the people that introduced the technology. The languages that share the same roots for these technologies are ones that are culturally linked to the point where ideas can be shared.

In all cases, the relative time depth of the adoption of new words can be partly assessed by the completeness of the adoption within groups of languages (in cases where there are competing roots), and by whether the sound changes relevant to each group have taken place in the new words. The proto-forms given for roots that have been introduced into Central Chadic are intended to reflect the likely form at the time of introduction.

We will look at three semantic categories of words where multiple roots exist – body parts, numerals and animals – as well as a miscellaneous category covering other roots. In each case, we will list the groups where the root is attested. Where it is not clear that the root can be attributed to the group as a whole (e.g. where the root is attested in just one language in the group), the group will be listed in parentheses. We will also attempt to identify the proto-language or area in which the root was introduced, though this is often difficult to establish.

Full data for all the roots cited here can be found at <http://centralchadic.webonary.org/>.

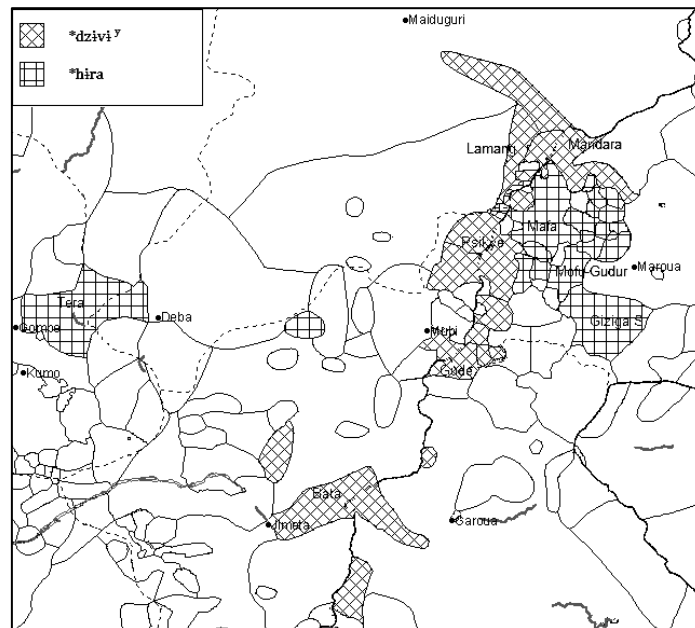
In the maps in this section, languages where no evidence for the root is available are left unshaded, even when the form for the proto-language of the group can be confidently established. Sample language names are indicated on the maps.

13.2.1 Body parts

The following basic body parts could reasonably be expected to have formed part of the vocabulary of Proto-Central Chadic. In the words given here there are multiple roots.

‘Arm’

Newman (1977a) does not reconstruct a Proto-Chadic root for ‘arm’. There are two well-attested roots in Central Chadic:



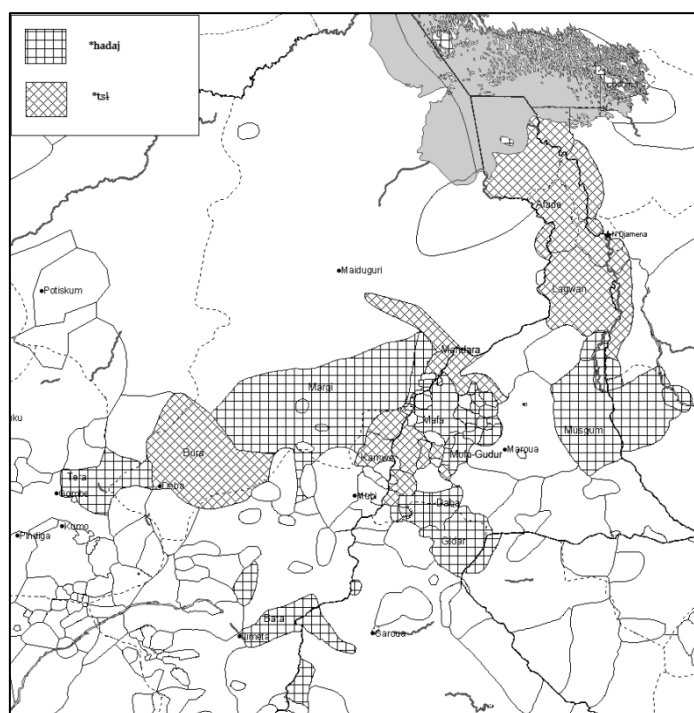
Map 34 - Isoglosses for ‘arm’

*hira – Mofu, Daba, Maroua, Hurza, Tera, Sukur groups (and Podoko from the Mandara group). With the exception of the Tera group, all these groups are found on or around the Mandara Mountains. The fact that the root also exists in Tera argues for this to be the Proto-Central Chadic root, if indeed there was only one Proto-Central Chadic root.

*dzivi^y – Bata, Higi, Lamang, Mandara groups. This root is a feature of the Nigerian Plains area.

The Kotoko groups (Lake Chad area) have different roots which distinguish between arm and hand. The Musgum and Gidar languages (Eastern Plains) do not use either of these two roots.

'Eye'



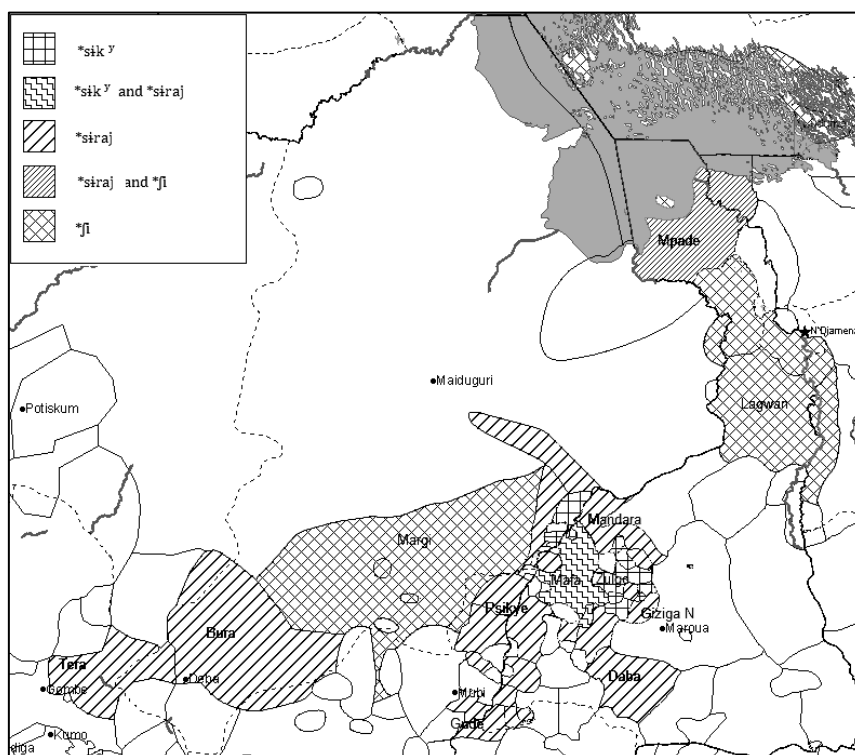
Map 35 - Isoglosses for 'eye'

*hadaj – Margi, Mofu, Bata, Daba, Hurza, Kotoko South, Lamang, Mafa, Mandara, Maroua, Musgum, Tera, Gidar, Kotoko Island groups. This root is reconstructed

*ɣin – Mandara, Margi, Mofu, Bata, Higi, Lamang, Mafa groups. This root may be related to the Proto-Chadic root **ka*. The final **n→r* change in the Mandara, Margi and Mofu groups indicates that the root has significant age. The root probably originated in the Northern Mandara Mountains and was adopted at an early time by the languages of the Nigerian Plains.

'Leg'

Newman reconstructs **asə* for Proto-Chadic, and notes the existence of **s-r-* in Central Chadic.



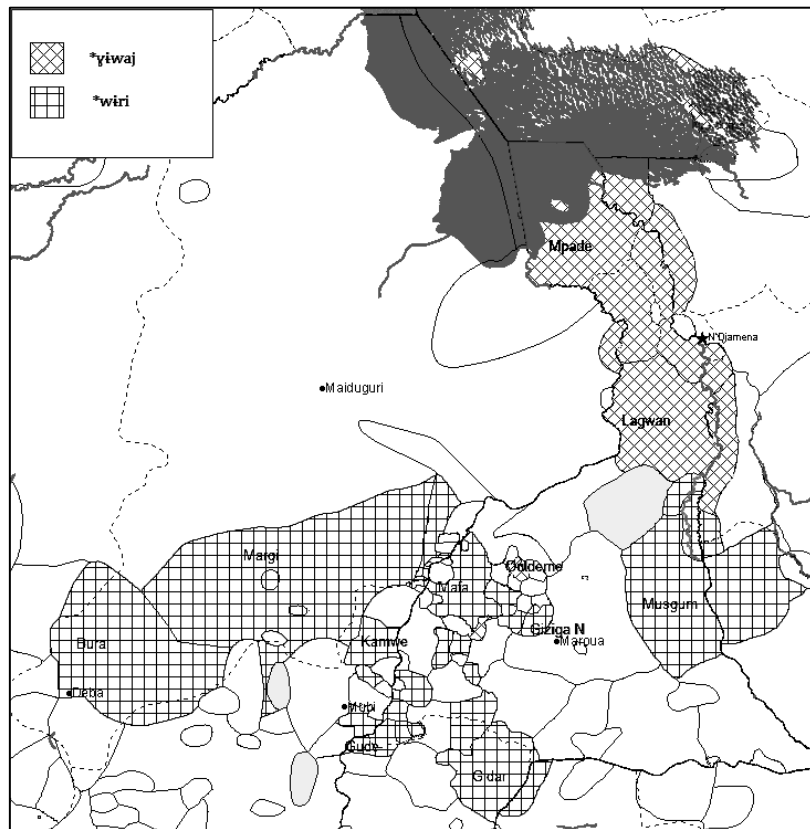
Map 37 - Isoglosses for 'leg'

*siraj - Higi, Lamang, Maroua, Hurza, (Kotoko North), (Daba), Mafa, Bata, Tera groups. This root should be considered the most likely root for Proto-Central Chadic.

*sik^ɣ – Mandara, Mofu, (Mafa) groups. This root appears to be an innovation in the Mandara-Mofu-Margi major group.

*fi – Margi, Kotoko North, Centre and Island groups. This is a borrowing from Kanuri *fi*.

'Neck'



Map 38 - Isoglosses for 'neck'

*wɪraj – Margi, Higi, Sukur, Mafa, Mofu, Maroua, Musgum, Kotoko South, Daba, Bata, Lamang, Gidar groups. This root is reconstructed by Newman for Proto-Chadic as **wara*.

*ɣiwaj – Kotoko Centre, North, Island, (Mafa), (Mofu) groups. This is probably a Lake Chad area innovation. The instance in individual languages of the Mafa and Mofu groups may be due to chance similarity, since there are no known paths of transmission between these languages, or may reflect an older root that has been replaced in other languages.

13.2.2 Numerals

The numerals ‘three’ and ‘four’ have well attested roots that have been reconstructed to Proto-Chadic. The only exceptions are the various Kotoko groups and the Musgum and Gidar groups which have different roots for ‘three’. The Kotoko Centre, North and Island groups also have different roots for ‘four’.

‘Two’

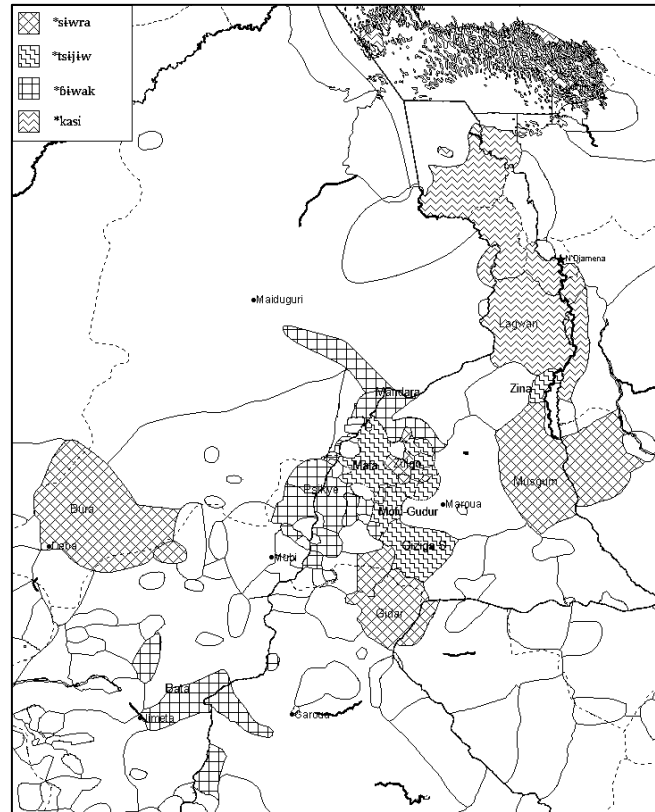
There are four widely-attested roots for ‘two’.

*siwra – Various languages in the Mofu, Mandara, Margi, Tera, Daba, Musgum and Gidar groups. This root is reconstructed by Newman for Proto-Chadic.

*tsijiw – Mofu, Maroua, Hurza, Mafa, Kotoko South groups. This root probably originated in the Mafa group, or in the area at the eastern edge of the Northern Mandara Mountains.

*biwak – Higi, Daba, Sukur, Bata, Mandara groups. This root is attested in a reasonably diverse set of languages, and so may be reasonably old, though it would not have been the Proto-Central Chadic root.

*kasi – Kotoko North, Centre and Island groups. This is an innovation in the Lake Chad area.



Map 39 - Isoglosses for 'two'

'Five'

Newman reconstructs **badə* for Proto-Chadic, but this root is not attested in Central Chadic. There are five roots that are well-attested.

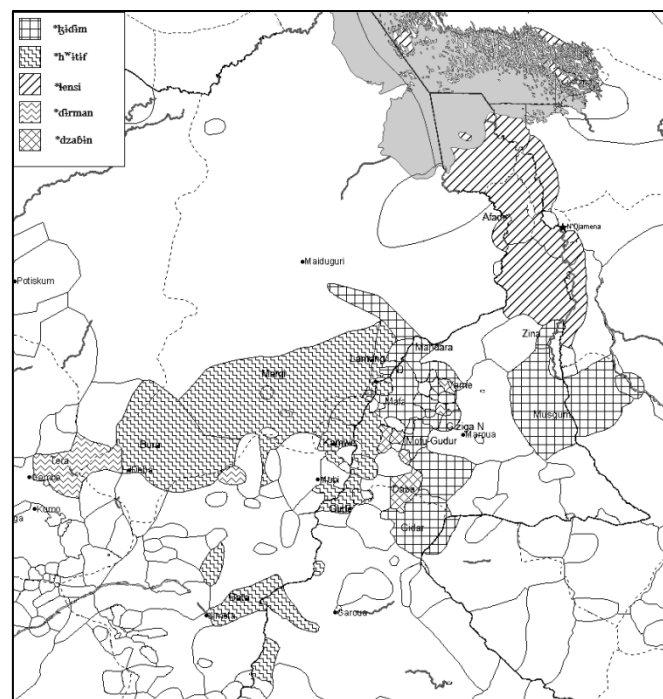
**ɓɪɗim* – Mafa, Mandara, Maroua, Mofu, Musgum, Sukur, Gidar groups. This root is the most widely attested root, and is the most likely root for Proto-Central Chadic.

**h^witɪf* – Higi, Lamang, Bata, Margi groups. This root is an innovation in the Nigerian Plains area.

**ɬensi* – Kotoko Centre, North and Island groups. This root, which is not reconstructed with confidence, is an innovation in the Lake Chad area.

*d̥ɪrman – Tera, Hurza and Kotoko South groups. These languages are geographically extremely distant, and the similar words may not all be cognate. Here, and in similar cases, the map treats the occurrences as reflexes of the same root, though we cannot claim with confidence that this is the case.

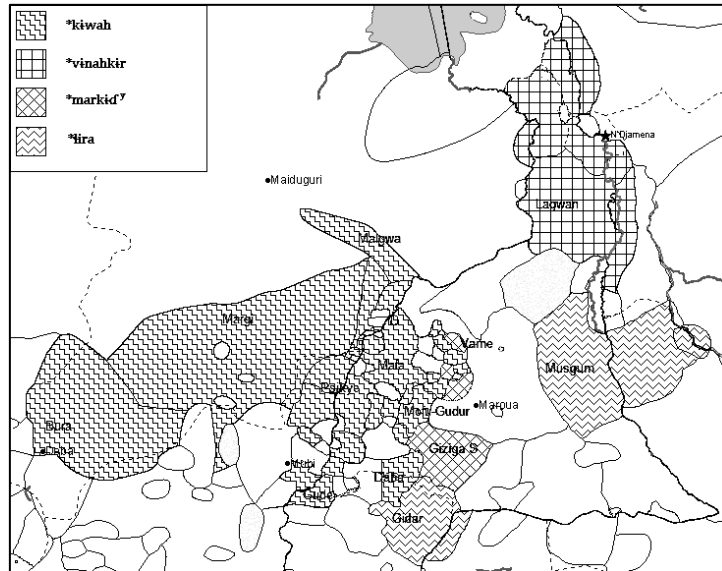
*dzaɓɪn – Daba group.



Map 40 - Isoglosses for 'five'

'Six'

Newman does not reconstruct a Proto-Chadic root for 'six'. There are four widely-attested roots.



Map 41 - Isoglosses for 'six'

*kiwah – Mandara, Margi, Mofu, Higi, Bata, Sukur, Daba, Lamang, Mafa groups. This is the most probable root for Proto-Central Chadic, given its wide geographical distribution and its presence in ten different groups and both the North and South sub-branches.

*vinahkir – Kotoko Centre and North groups. This is an innovation in the Lake Chad area. Kotoko Island has borrowed a Kanuri word for 'six'.

*markidʷ - Hurza, Maroua groups.

*hira – Musgum, Gidar groups.

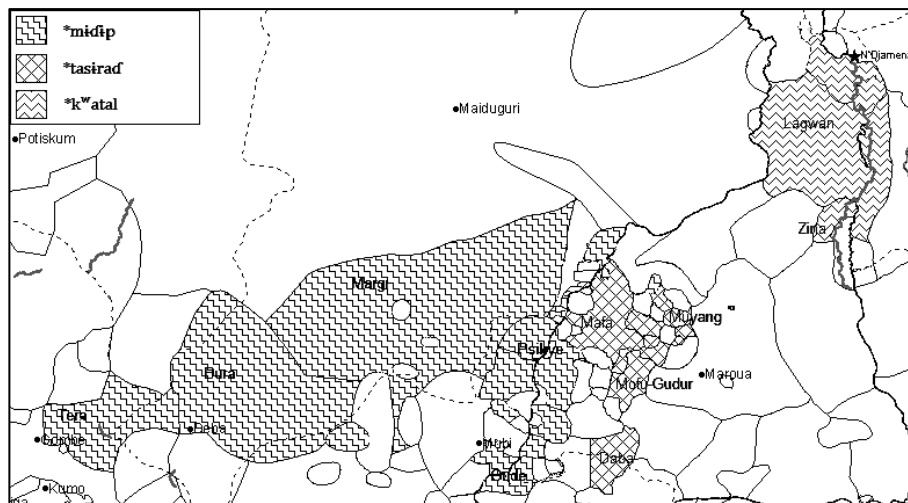
'Seven'

*midip – Mandara, Margi, Bata, Higi, Tera, Sukur groups. This root is a feature of the Nigerian plains.

*tasirad - Mafa, Daba, Mofu groups. This root may have originated in the Mandara Mountains.

*k^watal – Kotoko South and Centre. The other Kotoko groups have borrowed from Kanuri.

The Maroua and Hurza groups each have separate roots for ‘seven’.



Map 42 - Isoglosses for 'seven'

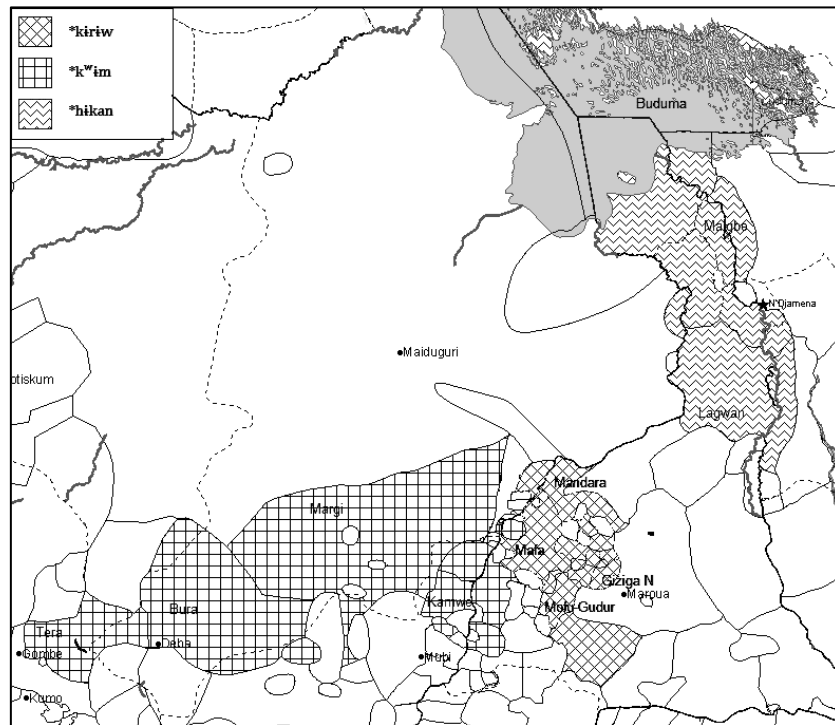
‘Ten’

*k^wim – Higi, Lamang, Margi, Tera, Sukur groups. This root may be a reflex of Newman’s Proto-Chadic *g^wam- ‘ten’. It is a feature of the Nigerian plains area.

*kɪriw – Mandara, Mofu, Hurza, Mafa, Maroua groups. This root is found around the Mandara Mountains.

*hikan – Kotoko Centre, North and Island groups. This root is a feature of the Lake Chad area.

The root **yaru* is found in several diverse languages, namely Ga'anda (Tera group), Bura and Margi South (Margi group), Kamwe-Nkafa (Higi), Mbara (Musgum), Buduma (Kotoko Island) and Malgbe (Kotoko North).

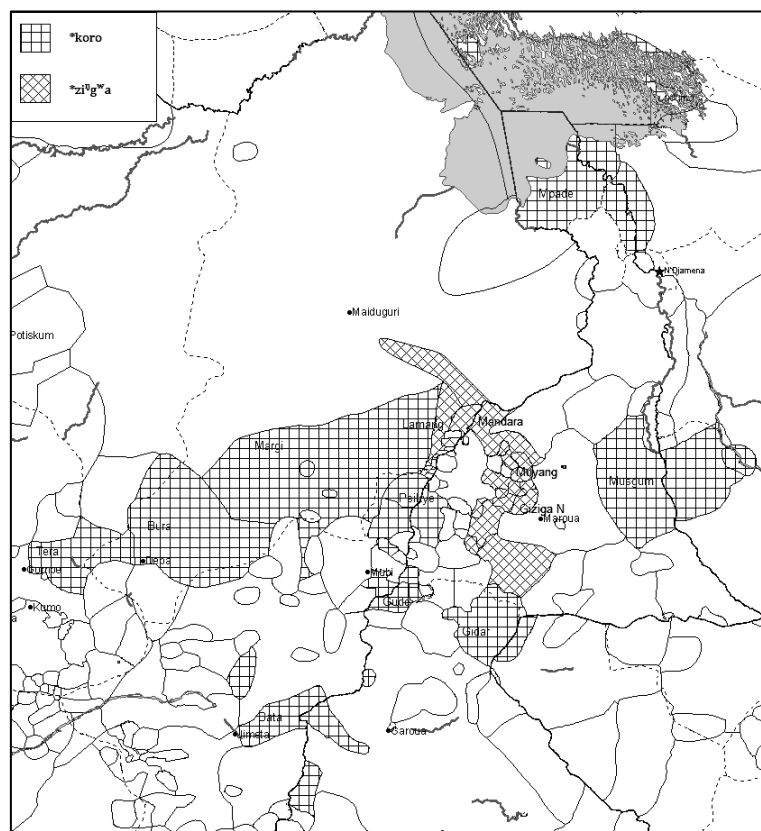


Map 43 - Isoglosses for 'ten'

13.2.3 Animals

Some of the words here were borrowed into Central Chadic from non-Chadic languages such as Kanuri, Kanembu, Dazaga or their Nilo-Saharan ancestors.

'Donkey'



Map 44 - Isoglosses for 'donkey'

*koro – Margi, Gidar, Musgum, Maroua, Higi, Bata, Tera, Kotoko North and Island groups. This is a widely-attested African *wanderwort* (Blench 2000). The reconstruction given includes *o, which did not exist in Proto-Central Chadic. In present-day languages, the root has been adapted to their phonologies, being interpreted as carrying a vowel labialization prosody in Gidar, or as /k^wara/ in many other languages.

*zi^hg^wa – Daba, Mafa, Maroua, Mandara, Mofu, Hurza, Lamang, Sukur groups. This root appears to have its origins in the Mandara mountains area. The /^hg^w/, unattested in the most reliable Central Chadic roots, may be an indication that this word was borrowed into Central Chadic, though its origins are unknown.

‘Crocodile’

The Kotoko groups have the root *rigi, whilst the root *kidim is used elsewhere.

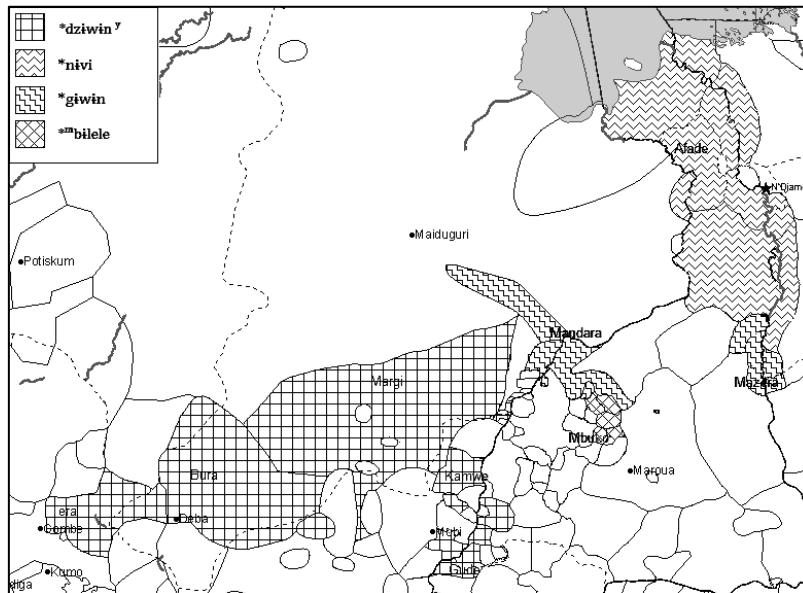
‘Elephant’

*dziwin^y - Margi, Higi, Bata, Tera, Sukur groups. This root is a feature of the Nigerian plains area. Newman (1977a) treats this as a reflex of Proto-Chadic *g^jawan.

*giwin – Mandara, Kotoko South groups. This root is probably also a reflex of Newman’s Proto-Chadic *g^jawan.

*nivi – Kotoko Centre and North. This root is a feature of the Lake Chad area.

*mbilele – Mofu, Hurza, (Bata) groups.



Map 45 - Isoglosses for 'elephant'

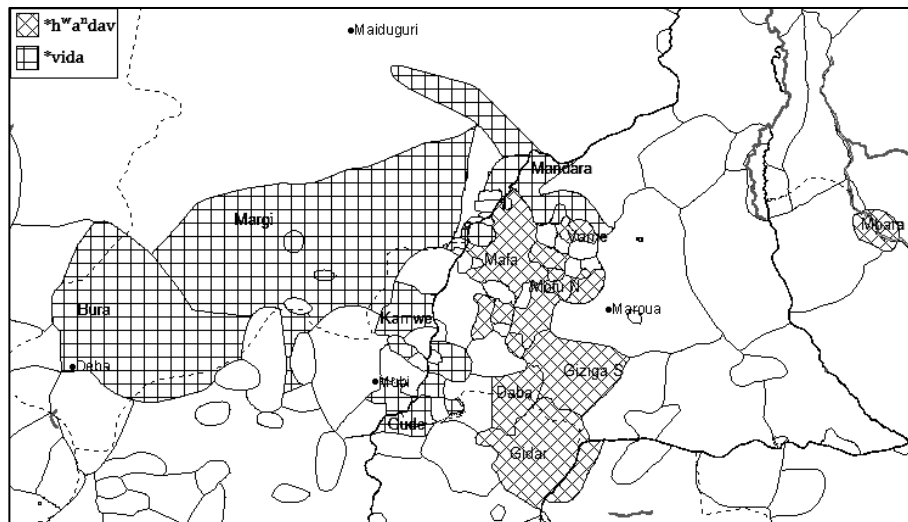
'Hare'

*h^waⁿdav – Mofu, Daba, Hurza, Mafa, Maroua, Musgum, Gidar groups. This root is a feature of the Mandara Mountains and Eastern Plains areas.

*vida - Bata, Higi, Lamang, Mandara, Margi, Sukur groups. This root is a feature of the Nigerian Plains area.

It is possible that these two roots are cognate.

There are a number of roots found amongst the Kotoko languages.



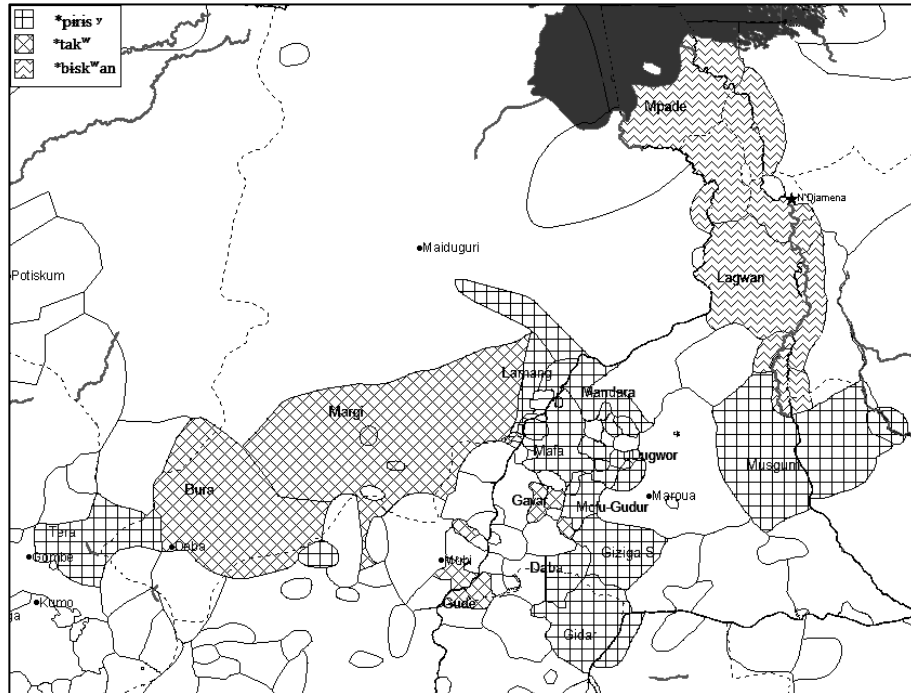
Map 46 - Isoglosses for 'hare'

'Horse'

*p̄iris^y - Mandara, Mofu, Tera, Mafa, Daba, Lamang, Hurza, Musgum, Maroua, Gidar groups. This is the most widespread Central Chadic root, and comes from the Arabic root *furs*.

*tak^w - Margi, Daba, Bata, Higi, Sukur groups. This root is a feature of the Nigerian Plains area.

*bisk^wan – Kotoko South, Centre and North groups. This root is a feature of the Lake Chad area.



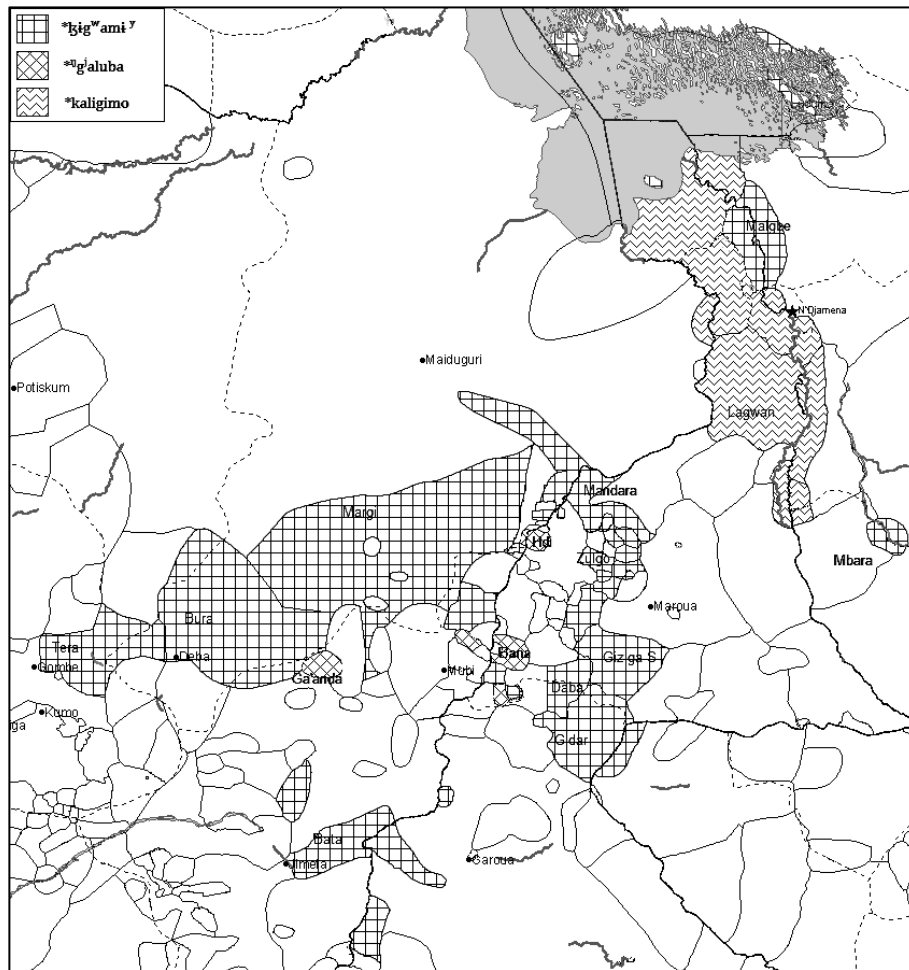
Map 47 - Isoglosses for 'horse'

'Camel'

The main Central Chadic root is *ʕig^wamɪ^v, which comes through Berber, e.g. Kabyle *aly^wəm* (Dallet 1982), but note that in Tuareg the reflex is less close to the Central Chadic root, e.g. Tamasheq *aylam* 'young adult camel' (Heath 2006).

*ʔg^laluba – This root is found in a few languages in the Nigerian plains area, namely Ga'anda (Tera group), Bana and Kirya (Higi group), Hdi (Lamang group) and Sharwa (Bata group). It is a recent borrowing from the Fulfulde *geelooba*.

*kaligimo – Kotoko South, Centre and North groups. This root is borrowed from Kanuri into the Lake Chad area. The Kanuri word *kàligimò* is an historic form, which has developed into the present-day form *kalímo* (Allison n.d.).



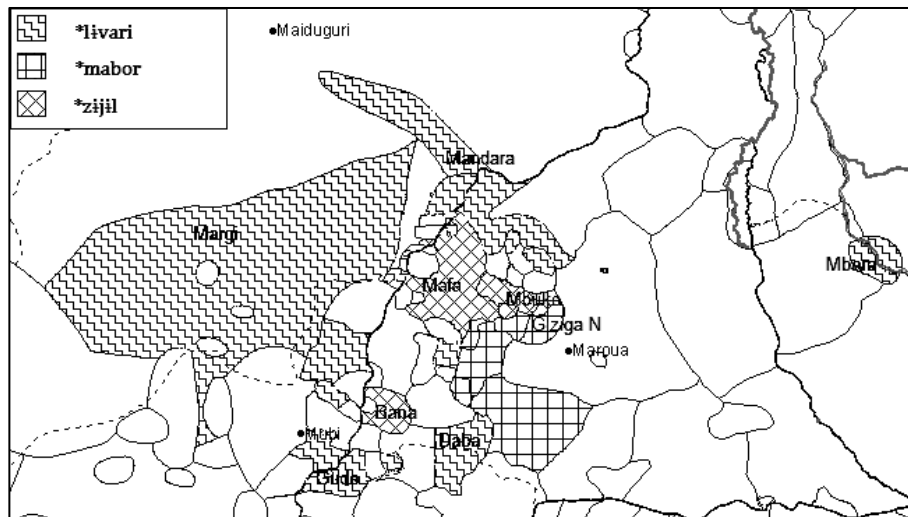
Map 48 - Isoglosses for 'camel'

'Lion'

*livari – Bata, Daba, Higi, Hurza, Mandara, Margi, Musgum, Sukur groups. This is a widely-attested root. The Musgum root *divarŋ* may well not be cognate. All the other languages are found broadly in the Nigerian Plains area.

*mabor – Hurza, Mofu, Daba, Maroua, Mafa groups. All of these groups are found on or near the Eastern Plains.

*zijil – Mofu, Hurza, Higi, Mafa groups. This root is mostly found in the languages around Méri (principally Mofu group languages). The presence of this root in Mafa and in Bana in the Higi group may be indicative of a wider use of the root, in the Mandara Mountains area.



Map 49 - Isoglosses for 'lion'

'Mouse'

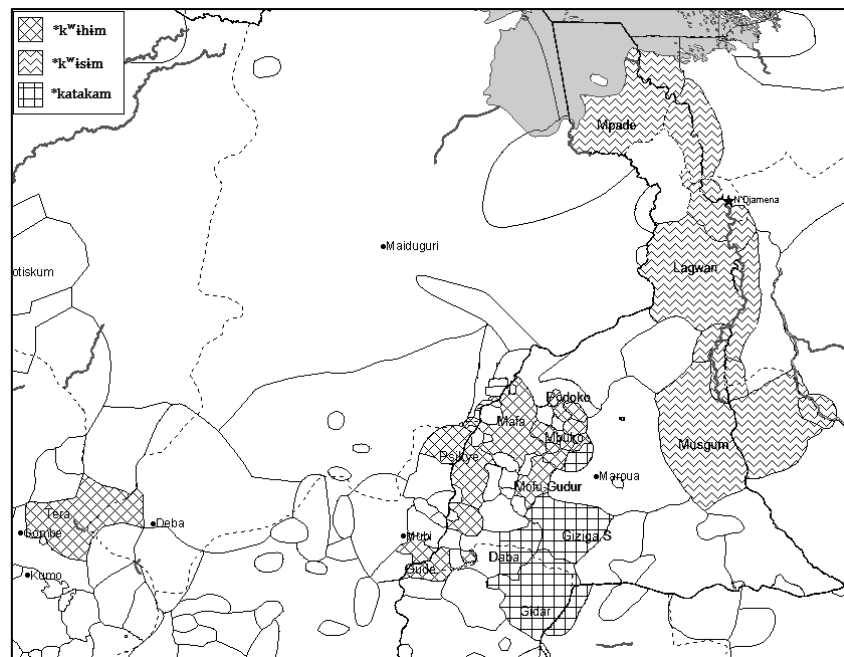
*k^wihim – Mandara, Mofu, Bata, Higi, Hurza, Mafa, Tera, Sukur groups. This root is the most widely attested, and may be the Proto-Central Chadic root.

*k^wisim – Kotoko Centre, South and North, Musgum groups. This root is undoubtedly cognate with the previous root. Newman has this as the Proto-Chadic form.

In these roots, the medial *s is found in West Chadic, but medial *h is found in East Chadic. *s is almost unattested in word-medial position in the Proto-Central Chadic reconstructions, and this may be due to a sound change *s→h change that affected Proto-Central Chadic at an early point in its history. If this is the case, then the instances of *k^wisim would have to be due to contact with

West Chadic languages, and given the geography, this too is problematic. There is similar patterning with the root **hĩmĩdʷ*/**sĩmĩdʷ* 'wind'.

**katakam* – Maroua, Gidar, Daba groups. This root is a feature of the Eastern Plains area.

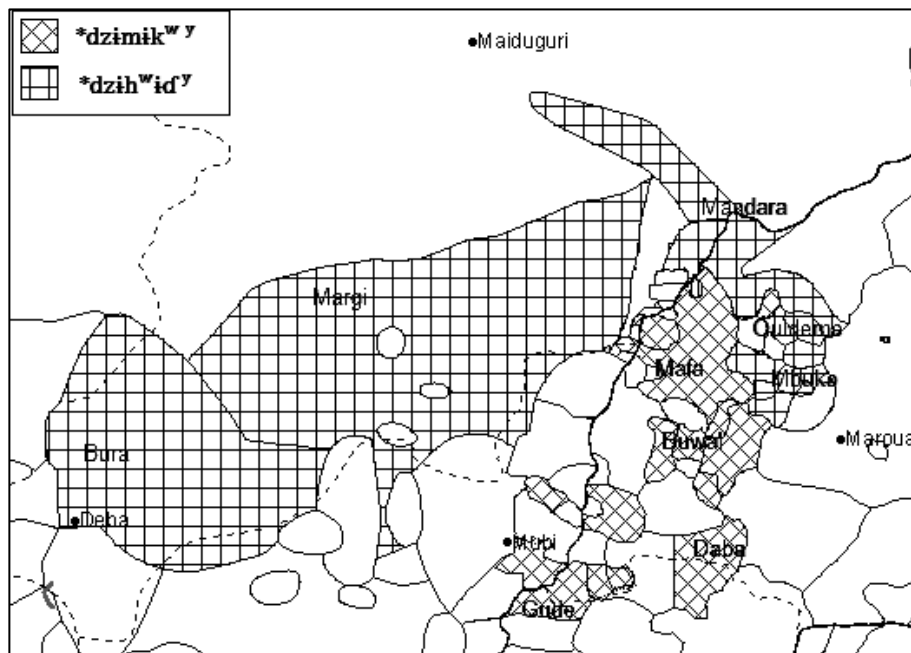


Map 50 - Isoglosses for 'mouse'

'Porcupine'

**dzimikʷ* - Higi, Lamang, Daba, Mafa, Bata, Sukur, (Mofu, Mandara) groups. This may be the Proto-Central Chadic root, or may be an innovation in the South sub-branch.

*tsh^wid^y - Mandara, Margi, Mofu, Hurza groups. This root is an innovation in the Margi-Mandara-Mofu major group, and has spread from there into the Hurza group.



Map 51 - Isoglosses for 'porcupine'

'Horn'

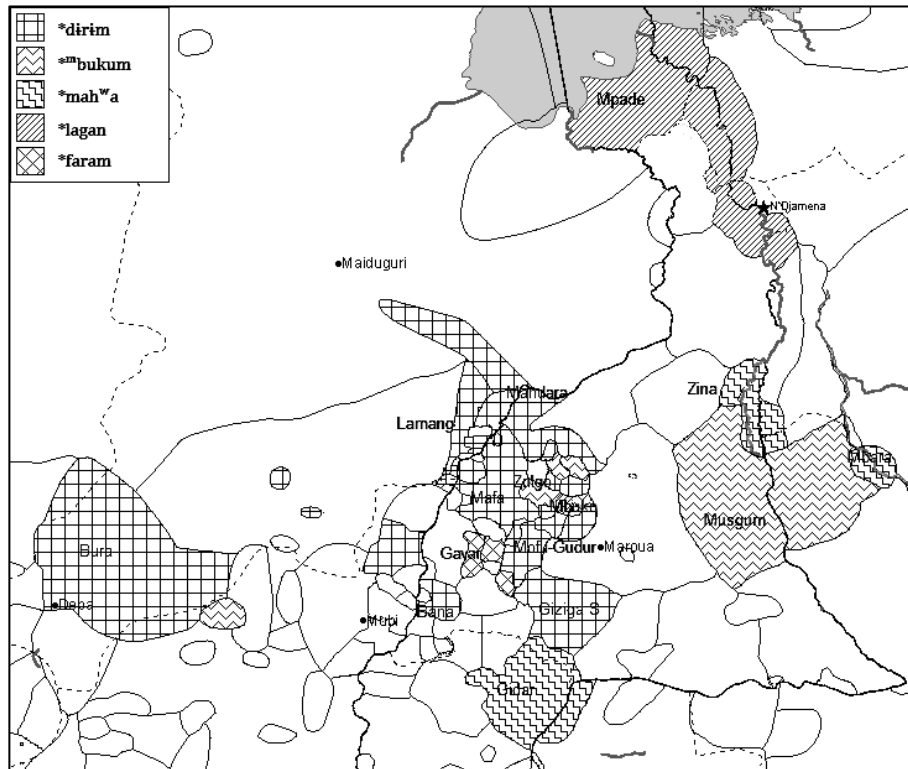
*dirim – Mandara, Margi, Mofu, Higi, Lamang, Mafa, Maroua, Sukur groups. This is the most widely-attested root and may be the Proto-Central Chadic form, though there are a surprising number of other roots attested.

*^mbik^wim – Mofu, Musgum, Tera, Hurza. The various reflexes of this root are fairly divergent and may not in fact be reflexes of a single root.

*mah^wa – Kotoko South, Musgum, Gidar. This root is a feature of the Eastern Plains area.

*lagan – Kotoko North and Centre, Hurza groups.

*faram – Daba group.



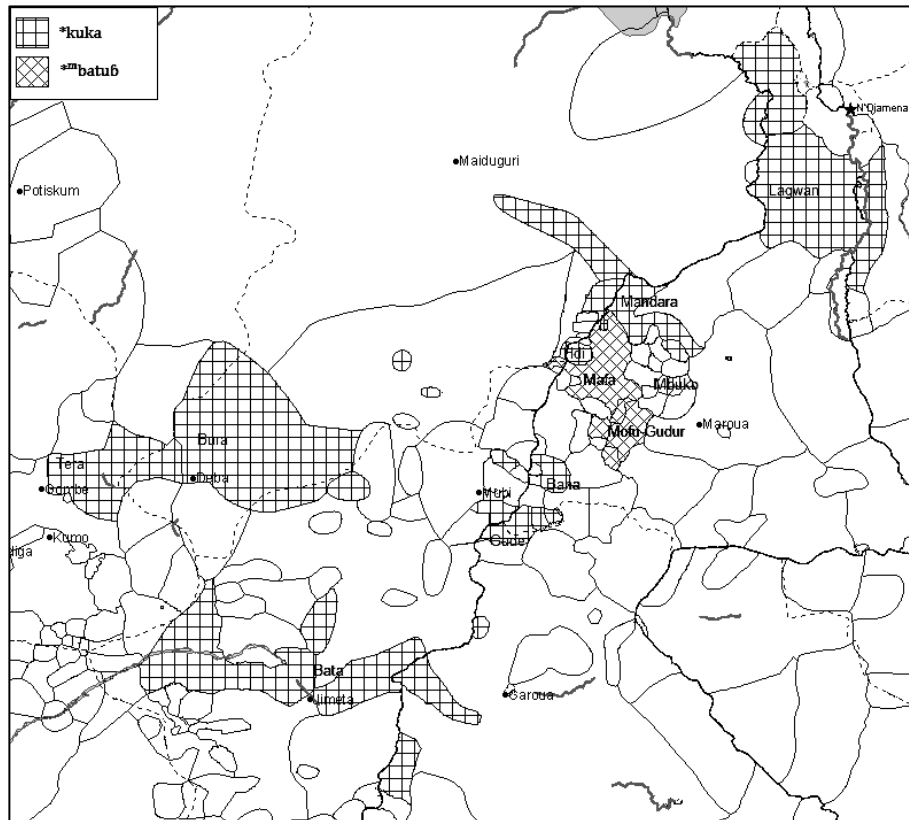
Map 52 - Isoglosses for 'horn'

13.2.4 Other

'Baobab'

*k^wikad – Mandara, Margi, Mofu, Bata, Higi, Hurza, Kotoko Centre and North, Lamang, Tera groups. This root was reconstructed by Newman for Proto-Chadic as **kuka*. He considered this to be a native Chadic word that was borrowed into Kanuri, though the opposite direction of borrowing also has support (Blench 2007). The patterns of the reflexes, and the limited evidence for a glottal component, are more consistent with this being a native Chadic word.

*^mbatuḅ - Daba, Mafa, Sukur, (Mofu) groups. This root appears to be an innovation in the Mandara mountains area.



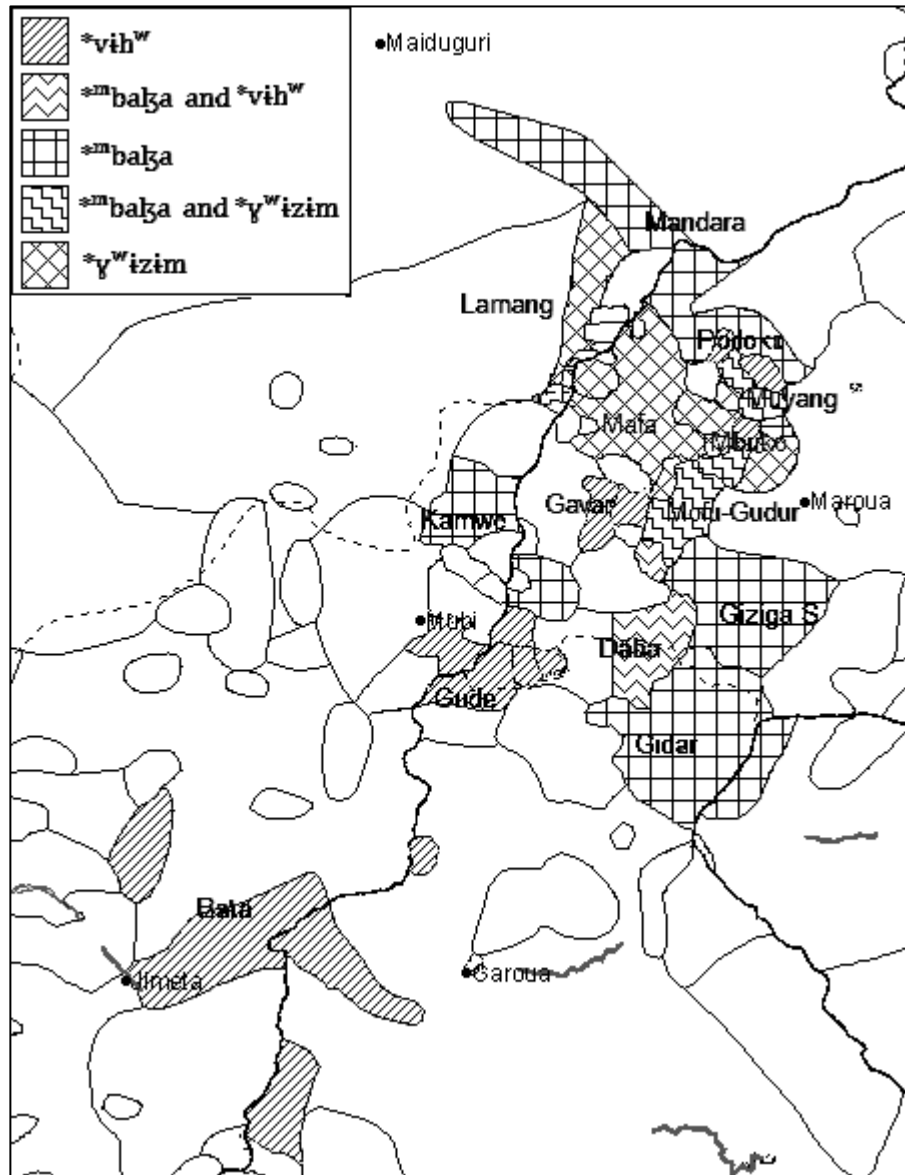
Map 53 - Isoglosses for 'baobab'

'Beer'

*^mbaḷa - Mandara, Mofu, Daba, Higi, Maroua, Sukur groups. This could be an early borrowing into Central Chadic of the Kanuri *mal* (Cyffer and Hutchinson 1990). (Proto-Central Chadic had no *l. As with the root for 'camel' *l was incorporated into Central Chadic as *ḷ.)

*vi^h - Bata, Daba, (Hurza), (Mandara) groups.

* γ^w izim – Mofu, Mafa, Lamang, Maroua groups. This root is a feature of the Mandara Mountains area.

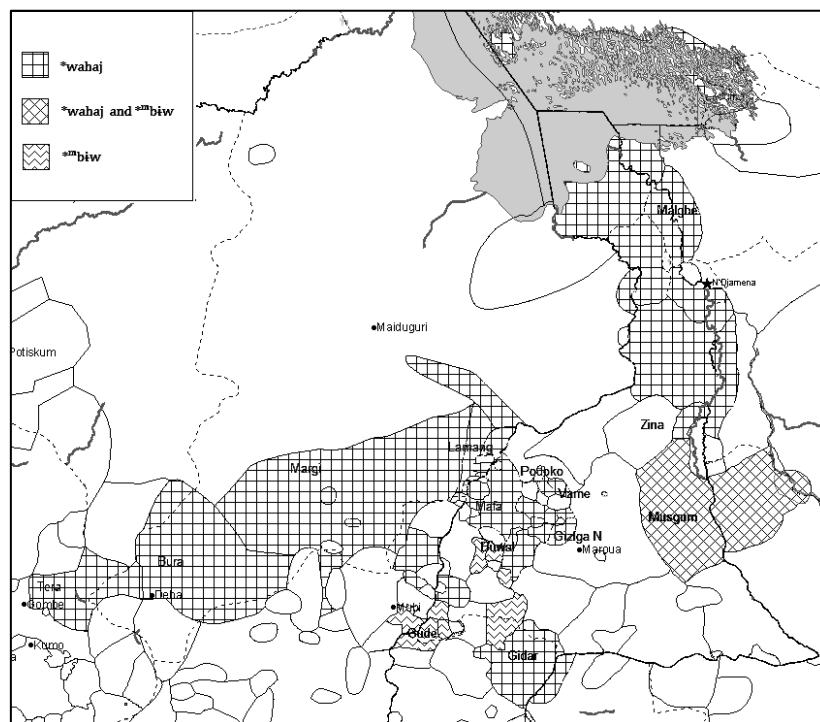


Map 54 - Isoglosses for 'beer'

'To give birth'

*wahaj - This may be the Proto-Central Chadic form.

*^mbiw – Daba, Bata, Musgum groups. This root may have originated in the Daba group and spread from there.



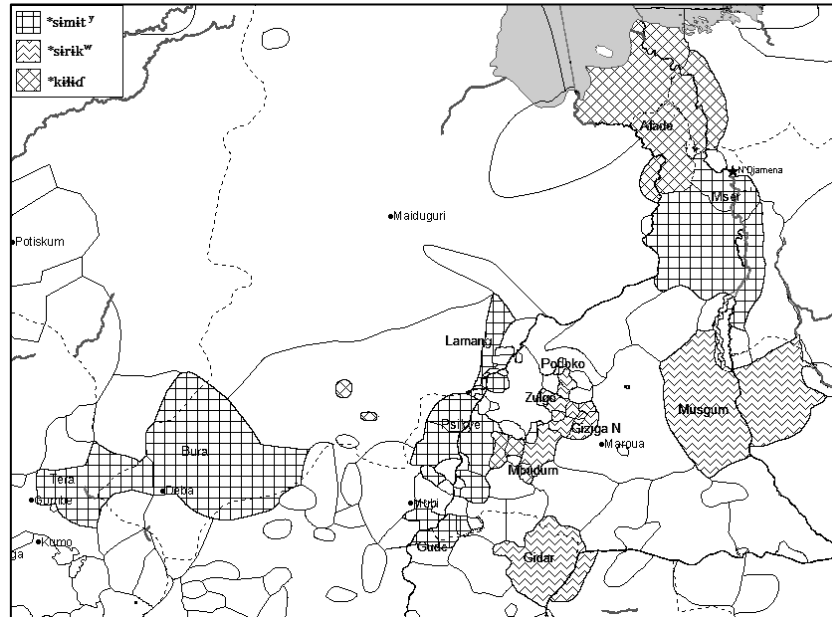
Map 55 - Isoglosses for 'to give birth'

'Broom'

*simit^y - Higi, Bata, Kotoko Centre, Lamang, Sukur, (Mandara, Margi, Mafa, Tera) groups. This root is primarily a feature of the Nigerian Plains area.

*sirik^w - Mofu, Musgum, Gidar, (Hurza, Maroua) groups. This root is a feature of the Eastern Plains area.

*kiɦɪɖ - Daba, Kotoko North, (Musgum, Margi) groups.



Map 56 - Isoglosses of 'broom'

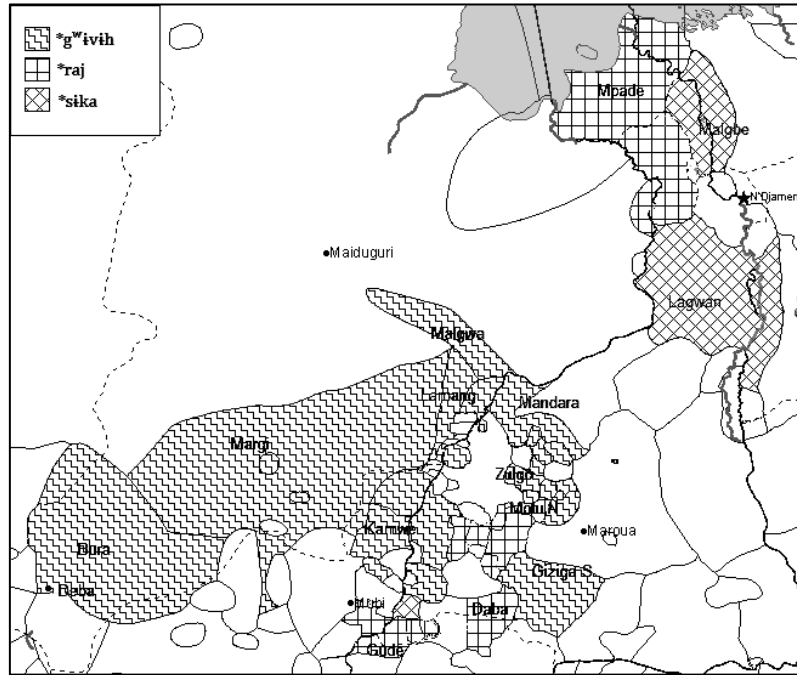
'Field'

The roots for 'field' are hard to identify with particular areas or genetic groupings. There may be confusion between roots for 'field' and for 'uninhabited land (the bush)', with semantic shift between the two taking place. The lack of a consistent widespread root indicates that agriculture was not practiced by the early Proto-Central Chadic-speaking peoples.

*g^wivɪɦ - Margi, Mandara, Mofu, Higi, Hurza, Lamang, Maroua, (Bata) groups.

*raj - Kotoko North, Bata, Daba, Mafa, Mofu.

*sika – Kotoko North and Centre, Bata groups.

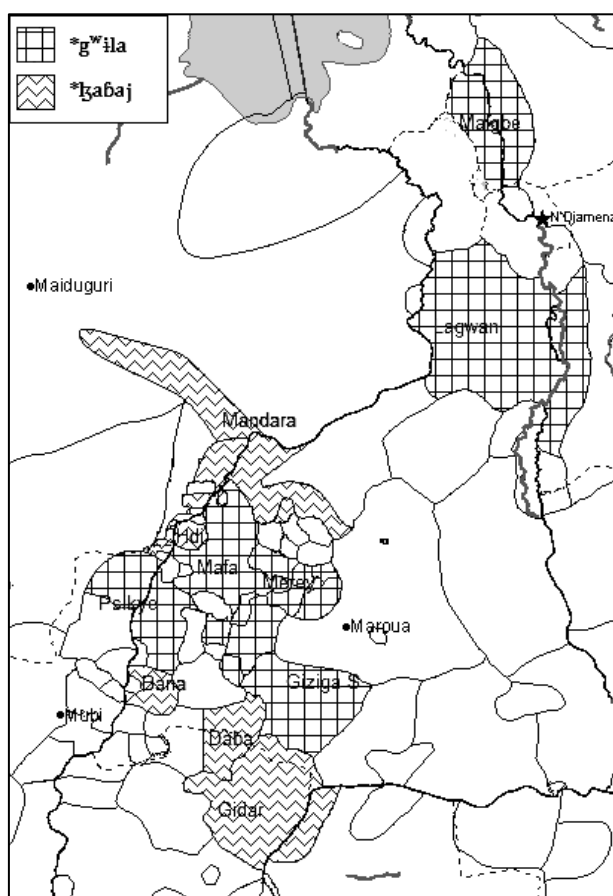


Map 57 - Isoglosses for 'field'

'Left'

*ɓabaj – Mandara, Sukur, Gidar, (Daba, Higi, Lamang) groups. This root is attested in a diverse collection of groups, which may indicate that this was the Proto-Central Chadic root and that *g^wila was adopted at a later stage.

*g^wila – Mofu, Daba, Mafa, Maroua, (Higi, Hurza, Kotoko Centre and North) groups. This is the most widespread root within Central Chad, but the presence of /l/, which did not exist in Proto-Central Chadic, indicates that this may not be the Proto-Central Chadic root. If the root was in fact *g^wira, we would expect to find the *r retained in the Daba and Mafa groups, which is not the case.

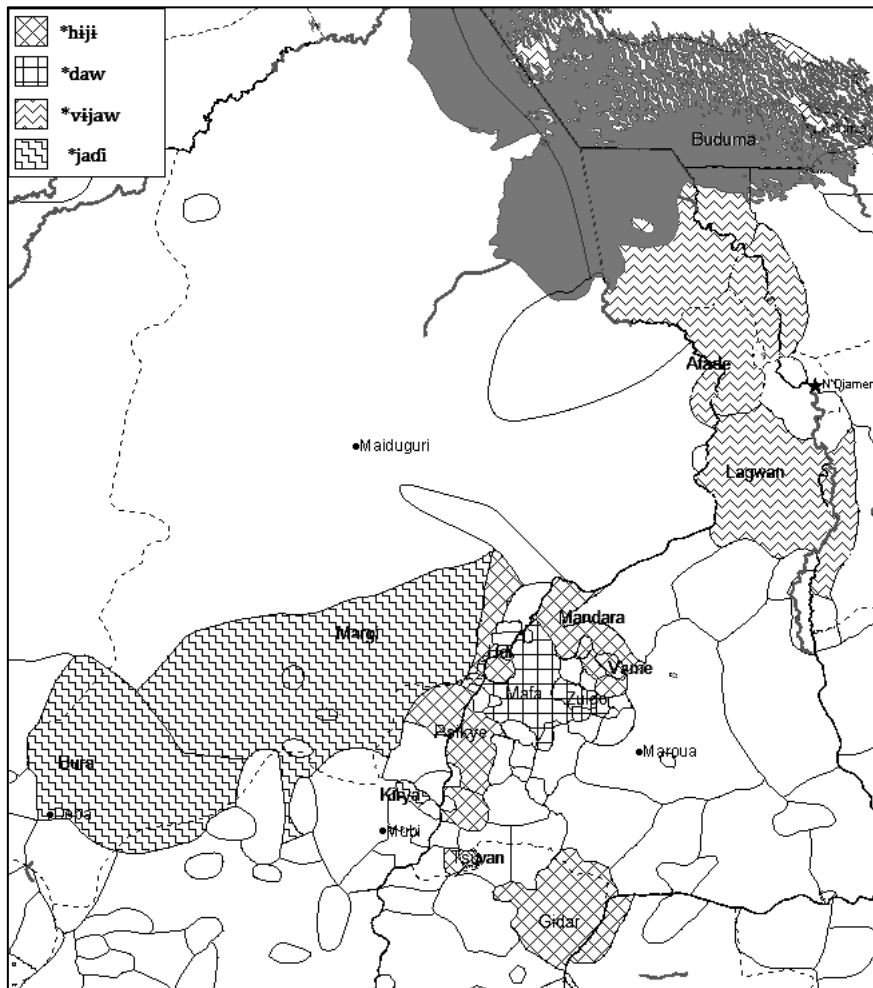


Map 58 - Isoglosses for 'left'

'Millet'

*hijj - Mandara, Mofu, Bata, Higi, Hurza, Lamang, Gidar, Sukur groups. This widely attested root may be the Proto-Central Chadic root, though the lack of a

single root for a concept that is so fundamental to current life-styles may indicate that the root is not as old as Proto-Central Chadic, and that millet was less fundamental to the Proto-Central Chadic speaking people than it is to their descendants.



Map 59 - Isoglosses for 'millet'

*daw – Mafa, Mofu, Hurza, (Maroua) groups. This root is probably a feature of the Mandara Mountains.

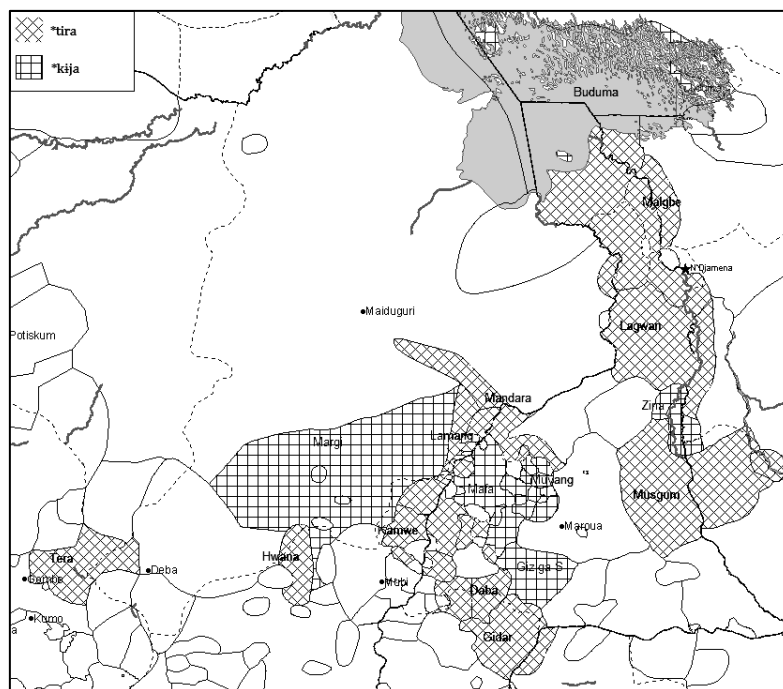
*vijaw – Kotoko Island, North and Centre, Hurza groups. This root is a feature of the Lake Chad area.

*jadī – Margi, (Higi) groups.

'Moon'

*tira – Mandara, Higi, Lamang, Musgum, Kotoko Centre and North, Daba, Tera, Sukur, Gidar groups. This is a well attested root across Chadic, reconstructed by Newman for Proto-Chadic as *təra.

*kija – Margi, Mofu, Hurza, Mafa, Maroua, Kotoko South and Island groups. This root may be an innovation in the Mofu-Mandara-Margi major group, or else a feature of the Northern Mandara Mountains.



Map 60 - Isoglosses for 'moon'

13.2.5 Summary

The number of multiple roots for one and the same concept within Central Chadic shows the complexity of the linguistic situation in the region. Although we cannot identify the origin of each root in these lists, we can see patterns of shared history between groups of languages. In the cases where the shared histories are not due to genetic relationships, they are indicative of contact between the groups. The patterns of sharing support the broad picture of contact-induced change in the four regions described earlier, namely the Nigerian Plains, the Mandara Mountains, the Eastern Plains and the Lake Chad area.

The following table shows the roots which can be associated with particular areas. The Proto-Central Chadic roots are not included.

Root	Nigeria Plains	Mandara Mountains	Eastern Plains	Lake Chad
arm	*dzivi ^y			
leg				*ʃi
neck				*ɣiwaj
two		*tsijaw		*kasi
five	*h ^w itif			*ɛnsi
six			*hira	*vɪnahkɪr
seven	*mɪdɪp	*tasɪrad		*k ^w atal
ten	*k ^w im	*kɪrɪw		*hɪkan
crocodile				*rigɪ
donkey		*zi ⁿ g ^w a		
elephant	*dziwɪn ^y			*nɪvi
hare	*vida	*h ^w a ⁿ dav	*h ^w a ⁿ dav	
horse	*tak ^w			*bɪsk ^w an
camel				*kaligimo
lion	*livari	*zɪjɪl	*mabor	
mouse			*katakam	*k ^w ɪsɪm
horn			*mah ^w a	*lagan
baobab		*mbatub		
beer		*ɣ ^w ɪzɪm		
broom	*simit ^y		*sirik ^w	
millet	*jadɪ	*daw		*vijaw

Table 178 - Roots associated with areal diffusion

13.3 Developments

In this section we will follow through the linguistic developments in the history of Central Chadic, and speculate on how these developments could relate to the history of the Central Chadic peoples.

Proto-Central Chadic would have been spoken somewhere around Lake Chad and the Mandara Mountains. The language split into Proto-Central Chadic North, Proto-Central Chadic South and Proto-Hurza. Proto-Central Chadic North may have been spoken around Lake Chad and the rivers that fed into it. Proto-Central Chadic South may have been spoken in the mountains further south, and it was the separation of the peoples of these two environments that resulted in the separation of the two languages.

At some point, some of the Central Chadic North peoples may have moved south and settled on the western edge of the Mandara Mountains, and their language developed into Proto-Higi in the south and Proto-Lamang in the North. These two groups may have been separated by the presence of the Sukur civilisation. Another group, comprising the Gidar, Musgum and Maroua peoples, settled to the east of the Mandara Mountains. The Margi-Mandara-Mofu people group remained to the north of the Mandara Mountains until events in the Kanem empire caused them to migrate further south, or seek refuge in the mountains in the case of the Mofu group peoples. When the Kanem empire relocated to Bornu, the Kotoko groups became isolated from the rest of the Central Chadic peoples.

The Central Chadic South peoples were fragmented by the southward movement of the Central Chadic North peoples, and by northward movement by non-Chadic peoples from the south. The Proto-Bata and Proto-Tera peoples had moved away from the Mandara Mountains to the west, with the Proto-Tera people living to the north of the Proto-Bata people. The Proto-Tera group became isolated from the rest of the Central Chadic peoples by the migration of the Margi group people, and were split into two locations, resulting in the separate development of West Tera and East Tera. The peoples speaking Bata group languages were split up and had their territory reduced by the arrival of non-Chadic peoples. The Bata and Bachama peoples became separated from the rest of the group, who found refuge on the south-western edge of the Mandara Mountains. The Sukur, Mafa and Daba peoples remained on the Mandara Mountains.

The Proto-Hurza speaking people were probably originally to the east of the Mandara Mountains, but became victims of the migrations of the Central Chadic North peoples, the Kanuri and the Fulani, eventually finding small parcels of territory on the eastern edge of the Mandara Mountains.

As a result of these movements, Central Chadic peoples from different branches of its history came to live in contact with each other. The Margi, Bata and Higi peoples shared the plains to the west of the Mandara Mountains, and the Mafa, Lamang, Sukur, Daba, Mofu, Hurza and Mandara peoples had contact within the Mandara Mountains themselves. There were also areas of contact between the Kotoko groups in the region just to the south-east of Lake Chad, and between the Gidar, Maroua, Musgum and probably the Hurza group on the plains to the east of the Mandara Mountains. Within each of these areas there was sharing of lexical items and shared development of phonological systems.

Up until the time when the proto-languages of the major groups were spoken, the behaviour of the palatalization prosody had remained more or less the same, probably causing the fronting of vowels and the movement of laminals to the post-alveolar place of articulation. This was the Mixed Prosody system, which is retained in some languages. At the time of the separation of the major group proto-languages into the proto-languages of the different groups the behaviour of the palatalization prosody diversified. In the Bata group, the palatalization prosody became entirely focussed upon the consonants of words. This behaviour, the Consonant Prosody system, spread to the neighbouring Higi and Margi groups, though in slightly different ways.

Meanwhile in the area of the Musgum or Gidar groups the palatalization prosody developed into a system of vowel harmony. This behaviour, the Vowel Prosody system, spread to the neighbouring groups, both within Central Chadic (Maroua, Daba, Mafa, Mofu, Hurza), and also Kera from East Chadic. As a result of the development of vowel harmony, the front vowel *i no longer contrasted with *i in palatalized words in some languages, and this loss of contrast may have been the trigger for its merger with one of the other vowel phonemes.

Following on from this, the labialization component of labialized velars began to be reanalysed in different ways. In Consonant Prosody languages, the labialization was able to transfer onto labial consonants, creating sets of labialized labial consonant phonemes. In some Vowel Prosody languages, the

labialization was reanalysed as back-rounding vowel harmony, creating languages with two prosodies, palatalization and labialization.

The spread of these systems is not complete. In the northern part of the area between the areas where the Consonant Prosody and Vowel Prosody systems are used (i.e. the Mandara, Lamang and Sukur groups), the behaviour of the palatalization prosody varies between being more consonant focussed or more vowel focussed, or combining the two, or being in the process of disappearing. Further to the north, in the four Kotoko groups, the palatalization prosody has gradually been disappearing as an active feature.

As the groups separated into today's individual languages, more differentiation has occurred. On the Consonant Prosody side, the rules concerning which consonants may be palatalized or labialized have changed in each language. Sometimes this has reduced the number of consonants that may be affected, but in other cases the number has greatly increased. On the Vowel Prosody side, some languages have remained with just the palatalization prosody, others have added the labialization prosody, and some have allowed the two to combine to create front-rounded vowels. In addition, there is variation in whether these prosodies only affect *a, or whether they also affect *i.

The result is today's wonderfully diverse range of languages with interesting and varied phonologies.

13.4 Further research

The conclusions in this study are based on the data and phonological analyses that are available. Much can be gained from increasing this knowledge. In particular, further research in the Bata, Margi, and especially the Higi group would increase our knowledge of the Consonant Prosody system. There are also certain interesting groups where there has been little research, such as the Tera and Kotoko South groups.

It is hoped that this study will also contribute to historical research in the rest of the Chadic family, and also in Afroasiatic studies. There are several questions that come out of this research. Amongst the consonants, it is unclear as to whether *p and *f were separate phonemes, and also as to whether there was a distinction between *ɬ and *ɮ at the time of Proto-Central Chadic and earlier. Further research is also needed to determine whether the affricates *ts and *dz existed as such at this time, and also to determine whether the pre-nasalized

consonants can be traced back as far as Proto-Chadic. There is also the question of the origins of the implosive phonemes, and whether they relate to the 'emphatic' consonants (pharyngealised or ejective) found in other branches of Afroasiatic.

