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► **To cite this version:**

Pascal Boyeldieu. Reflexes of a Labiovelar Series in Central Sudanic. A. Abu-Manga, L. Gilley & A. Storch. Insights into Nilo-Saharan Language, History and Culture. Proceedings of the 9th Nilo-Saharan Linguistics Colloquium, Institute of African and Asian Studies, University of Khartoum, 16-19 February 2004, Rüdiger Köppe, p. 129-151, 2006, Nilo-Saharan 23. halshs-00331321

**HAL Id: halshs-00331321**

**<https://shs.hal.science/halshs-00331321v1>**

Submitted on 17 Dec 2008

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Boyeldieu Pascal, 2006, Reflexes of a Labiovelar Series in Central Sudanic, *Insights into Nilo-Saharan Language, History and Culture. Proceedings of the 9th Nilo-Saharan Linguistics Colloquium, Institute of African and Asian Studies, University of Khartoum, 16-19 February 2004* (A. Abu-Manga, L. Gilley & A. Storch eds), Köln, Rüdiger Köppe Verlag (Nilo-Saharan 23), 129-151.

## Reflexes of a Labiovelar Series in Central Sudanic

Pascal Boyeldieu (CNRS/LLACAN, France)

### 1. INTRODUCTION

The *Central Sudanic [CSD]* languages are spoken in central Africa over parts of the D.R.C., Uganda, Sudan, C.A.R. and Chad. They comprise six subgroups of unequal size (representative languages are indicated in parentheses):

- [MMD] *Moru-Madi* (Moru, Avokaya, Logo, Lugbara, Ma'di),
- [LND] *Lendu* (Ngiti, Lendu),
- [MAS] *Mangbetu(-Asua)* (Asua, Mangbetu, Meje, Lombi),
- [MEF] *Mangbutu-Efe* (Mangbutu, Ndo, Mamvu, Lese, Efe),
- [KRS] *Kresh* (Kresh, Dongo, Aja ?),
- [SBB] (*Sara-*)*Bongo-Bagirmi* (Modo, Baka, Bongo, Yulu, Gula dialects, Ndoka, Bagiro, Na, Kenga, Bagirmi, Sara languages).

SBB is the most important subgroup in respect to both number of languages and geographical extension (see map).

While Tucker & Bryan (1956, 1966) divided these languages in two different 'larger units' (Moru-Mangbetu vs Bongo-Bagirmi) despite their lexical and grammatical affinities, Greenberg (1963) grouped them together as the Central Sudanic branch of his Nilo-Saharan phylum.

Both Bender (1992) and Ehret (1992) tried to establish regular phonetic correspondences for these languages but in a rather unconvincing way.<sup>1</sup> The aim of this paper is to provide some evidence for correspondences involving articulations of the labiovelar type with the help of more recent data.<sup>2</sup>

### 2. DOCUMENTATION AND COMPARATIVE SERIES

Despite gaps and unevenness in the documentation, most of the subgroups of Central Sudanic are relatively well documented by published data, for at least two languages (e.g. Mamvu and Lese for MEF). Nevertheless the documentation on the KRS languages is rather scanty and the position of Aja within the subgroup is uncertain. Therefore Kresh, Dongo and Aja forms will

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<sup>1</sup> To say things in a short way, Bender accepts more variations of sound and meaning than should be allowed in this kind of work. He namely identifies four series illustrating a CSD \*kp formula: 71. \*kpa 'big, long', 127. \*kpa 'bone', 128. \*kpa-gba 'hard' and 155. \*ekpi 'cough' (his numbering) while only the second one seems to be relevant to me (see comparative series n° 2, 13, 14 and 15 below). Ehret (whose 1992 work has not been published) is not reliable as a whole, although he recognizes the \*kw and \*gw reflexes of MMD and may suggest some relevant cognations, like 'white' and 'moon' (see n° 25 below), for which I am indebted to him. Of course I took advantage of new data, published in the last decade.

<sup>2</sup> I am very grateful to Raymond Boyd, Gerrit Dimmendaal, Robert McKee and Okoth Okombo for their reactions to a first draft of this paper. Some of their comments will be cited below.

be quoted as a reminder but they will neither be commented upon nor interpreted.

The data sources are indicated in Table 1 (see complete references at the end of this section). Note that Vorbichler (1969) made some phonemic corrections for Lese (involving the frequent replacement of an original **gb** with **qp**) which are marked in the comparative series by (69).

For reasons of space, the SBB languages are illustrated as a whole by reconstructions cited from Boyeldieu (2000) and Boyeldieu, Nougayrol & Palayer (in preparation) (see the former for details of the consonant reflexes). The ‘distribution level’ ([1] to [5]) refers to the distribution of the lexical reflexes and probable antiquity of the SBB lexical series, [1] being the highest value.

Roughly speaking, CSD words seem to derive mainly from \*VCV shapes (sometimes also \*CV ?) which have become either CV or (C)VCV in the modern languages. Therefore the correspondence formulas concern consonants which, in most cases at least, were – and still are – intervocalic.

Table 2 displays the reflexes of four likely labiovelar correspondence formulas at the CSD level, **\*kp**, **\*gb**, **\*ngb** and **\*ɲm**, not only for modern languages but also for intermediate stages, defined as later levels which are historically common to each subgroup, MMD, LND, MAS, MEF and SBB.

The remaining tables show different comparative series (numbered from 1 to 35), most of which illustrate the correspondence formulas. Uncertain cognates are given in parentheses, followed by a ‘?’. As will be seen, some of these series seem to be relatively consistent with regard to vowels, while others are much more problematic, without even taking tones into account. Another problem is the fact that very few comparative series have clear cognates throughout all the subgroups; most of them show gaps. Consequently the identified formulas have to be regarded as working hypotheses rather than as accurate reconstructions, at least for the time being.

Although nothing sure can yet be said concerning vowels, it seems likely that the labiovelar formulas as a whole were, already at the CSD level, mainly followed by front or central vowels (like **i**, **e**, **ɛ**, **a**). Mergers or neutralizations respectively with **\*k**, **\*g**, **\*ng** and **\*ɲ** or **\*m** may have occurred before back vowels at an earlier time. Similar tendencies could also justify some cases of *osculation*, where labiovelars seem to alternate, in an irregular way, with other consonants in the same series (see **\*kp/\*k** in 8 and 11, **\*gb/\*g** in 19-21, **\*ɲm/\*m** in 33).

### 3. REFLEXES OF **\*kp**

The best series illustrating a CSD **\*kp** formula are 1.clean, 2.bone, 3.man, male, 4.play/game/song, 7.tree, 8.bowels and 9.seed, grain.

In MMD, reflexes of **\*kp** are **kw/tsw** (before **a/ɛ~i**) in Miza and Moru-ägi, **hw/kw** (before **a/ɛ~i**) in Ug. Ma’di and **f** in all other languages. The most likely form of a common reconstruction at the MMD level is **\*kw**.

In LND, the reflexes are **kp** (series 1-4, 6) in all languages but apparently also **ts**, if the forms cited in the series 7-9 are reliable cognates (note that parallel reflexes of **dz** and **nz~ndz** also occur in the cases of **\*gb** and **\*ngb**, see below). The conditioning of these variants is unclear. It may have been of a vocalic nature (alveolar affricates before front or high vowels? see the

situation in Miza and Moru-ägi above) but then it must have occurred at an earlier stage, prior to vowel changes, since the current vowels observed after **ts** (and **dz**, **nz~ndz**) are not quite consistent with this explanation. In any case, the common formulas at the LND level have to be reconstructed as **\*kp** and **\*ts** respectively.

The reflexes of CSD **\*kp** are less obvious in MAS. I suggest that the **kp**'s occurring throughout MAS in series 2.bone are not instances of regular reflexes; these should rather be sought from other series, none of which is complete for this subgroup. However, series 12.hen, though limited to MAS only, gives a full set of the likely reflexes which are **kw** in Aka, Asua and Lombi D, **xw** (/h before o?) in Lombi L and **w/ø** (ø before a under certain conditions?) in Mangbetu. Therefore the common reconstruction at the MAS level has to be characterized as **\*kw**.

In MEF, the reflexes are clearly Mamvu **f** and Lese **gb** (**qp** 69),<sup>3</sup> which can probably be reconstructed as a common **\*kp** at the MEF level.<sup>4</sup>

Finally the SBB common reconstruction is **\*kp**, whose reflexes are **kp**, **k**, **t**, **p** or **ø** (sometimes with compensatory nasalization of the vowel) in the modern languages.

CSD **\*kp** alternates with **\*k** in series 8 and 11.

As is the case for MAS in series 2 (see above), series 13-15, which I consider irregular, show different occurrences of **kp** both in MMD and in MAS (maybe also **qb** in MEF, see series 15?) but I suggest that these **kp**, although they do belong to the phonological systems of the languages, are not historical reflexes of the CSD formula **\*kp**.

#### 4. REFLEXES OF **\*gb**

The evidence for a CSD **\*gb** formula, mainly provided by the series 16-17 (and 20?), is less obvious and some of its reflexes are unclear.

MMD has reflexes parallel to those of **\*kp**, namely Miza **dzw/dz̥w** and Moru-ägi **dz/dz̥** (both before **ε/i**), Ug. Ma'di, Lokai and Lulu'ba **gw**, other languages **v**. It is unclear whether the instances of **g** before **u** (all languages) occurring in series 20 have to be regarded as a reflex of **\*gb** in this vocalic context or as a result of a **\*gb/\*g** osculation. The common MMD reflex may be given as **\*gw**.

LND has parallel reflexes which are **gb** (series 16, 20-21) and most probably **dz** (series 17, 19) for all languages. Consequently the LND common reconstructions are **\*gb** and **\*dz**.

In MAS, Asua D, Mangbetu and Lombi D (other languages are not documented) usually show **g** (series 16-17, 19, 21) but again it is not clear whether these **g**'s are reflexes of **\*gb** or a result of CSD **\*gb/\*g** osculations, such as the ones observable at least in SBB in series 19 and 21.

<sup>3</sup> Vorbichler (1969: 144) distinguishes three voiceless back phonemes for Lese, namely /**kp**/ ('voiceless explosive', for which he cites 4 instances), /**qb**/ ('voiceless labio-postvelar implosive', 4 instances) and /**qp**/ ('voiceless labio-postvelar explosive', 6 instances). Do they really contrast in the language?

<sup>4</sup> Note that MEF is characterized on the basis of Mamvu and Lese only, two closely related languages. It could be revised if one considered other languages like Mangbutu and Ndo, for which I could not find available data.

The MEF situation is unclear and insufficiently documented: series 16 gives Mamvu **g** and Lese **gb** (**kp** 69), but series 19 gives **g** (< **\*g**?) for both languages.

SBB as a whole has a **\*gb** reconstruction (16-17, 20) but shows osculations with **\*g** in 19 and 21. Modern languages have **gb**, **g**, **d** or **b** as reflexes of **\*gb**.

Finally, I consider series 22-23 as irregular, as Mangbetu and MMD **gb** are not historical reflexes of CSD **\*gb** (in both series, the reflexes of SBB **\*gb** are themselves irregular).

## 5. REFLEXES OF **\*ngb**

The CSD formula **\*ngb** is somewhat better documented by series 23-26.

MMD reflexes, parallel to those of **\*kp** and **\*gb**, appear as **ngw/ndʒw~ndzw** (before **a/ε**) in Miza and Moru-ägi, **ngw** in Ug. Ma'di, Lokai and Lulu'ba, and **mv** elsewhere. The common reflex for MMD is characterized as **\*ngw**.

The LND languages again have either **ngb** or **nz~ndz**, both reflexes appearing in the sg. and pl. forms respectively of series 24.child. LND reconstructions are given as **\*ngb** and **\*ndz**.

In MAS, all languages have **ngw~ngw** (before **a** and **ε**, 24-25) and **ng(w)** (before **o**, 26), which can be reconstructed as MAS **\*ngw**.

For MEF, series 24-26 show Mamvu **ng** (before back vowels) and Lese **gb**.<sup>5</sup> Mamvu **ngb** (series 28) might be understood as a complementary variant of **ng** before **a** but uncertain cognates in series 27 and 29 are not consistent with this idea. Therefore the characterization of a common MEF reconstruction as **\*ngb** is tentative.

The only clear instance of SBB **\*ngb** appears as an uncertain cognate in series 27, so that reflexes of CSD **\*ngb** in this subgroup, though probable, are not firmly established (SBB reflexes of **\*ngb** are **ngb~ɲb**, **ng**, **nd** or **mb**).

Finally, series 29-30, which I consider irregular, show some instances of MMD **mgb~ngb** (MMD **\*ngb**?) which are not historical reflexes of CSD **\*ngb**.

## 6. REFLEXES OF **\*ɲm**

Though scanty and deficient, series 31-33 seem to offer some evidence of a CSD **\*ɲm** formula.

In MMD (see also 34-35), reflexes are **ɲ(w)** in most languages and **ny~ɲ** in Keliko (but 35 **ɲ**), Lugbara, Lugbara C and Ug. Ma'di. The instances of **m** before **u** (series 32) could be regarded as variant reflexes of MMD **\*ɲw** in this particular vocalic context.

The available reflexes in LND are usually **m**, except for Ddradha, which has **ɲ** (series 33), thus strongly suggesting **\*ɲm** as a common LND reconstruction.

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<sup>5</sup> The correspondences of Mamvu prenasalized voiced obstruents with Lese plain voiced obstruents are regular and well attested.

In MAS, Asua D and Mangbetu **mu~mw** and Lombi D **ɲw** are illustrated by the same incomplete series and suggest a common MAS reconstruction **\*ɲw**. Robert McKee (*pers. comm.*) very kindly completed these data for a subdialect of Meegy (or Meje), another MAS language, with **nóɲ<sup>w</sup>ɛ̃ ~ nó<sup>m</sup>ɛ̃** ‘fly-whisk’ and **nóɲ<sup>w</sup>à ~ nó<sup>m</sup>à** ‘spoil, rot (intr.)’, which emphasize the phonetic affinities and alternations between [ɲ<sup>w</sup>] and [m<sup>w</sup>].

There are no available MEF data concerning possible reflexes of CSD **\*ɲm**.

Finally SBB has **\*ɲm** (31), partially alternating with **\*ng** (32), but **\*m** everywhere in (33), indicating an **\*ɲm/\*m** osculation at the CSD level. Reflexes of SBB **\*ɲm** in modern languages are **ɲm, ɲ, m** or **ṽ**.

## 7. THE PHONETIC NATURE OF CSD LABIOVELARS

CSD labiovelar formulas have thus far been characterized as **\*kp, \*gb, \*ngb** and **\*ɲm** respectively.

Yet the question of the exact phonetic nature of these consonant formulas remains open. It has been shown that they may be identified, at intermediate levels, either as *labialized velar stops* (**\*kw, \*gw**, etc.) or as *doubly articulated labial-velar stops* (**\*kp, \*gb**, etc.) according to the different subgroups.<sup>6</sup> Reflexes show a remarkable parallelism in the sense that MMD and MAS are throughout characterized with articulations of the first type, while LND, MEF and SBB show articulations of the second type. Subgroup formulas are summarized in the following table:

| CSD | <b>*kp ~ *kw ?</b> | <b>*gb ~ *gw ?</b> | <b>*ngb ~ *ngw ?</b> | <b>*ɲm ~ *ɲw ?</b> |
|-----|--------------------|--------------------|----------------------|--------------------|
| MMD | <b>*kw</b>         | <b>*gw</b>         | <b>*ngw</b>          | <b>*ɲw</b>         |
| LND | <b>*kp / *ts</b>   | <b>*gb / *dz</b>   | <b>*ngb / *ndz</b>   | <b>*ɲm</b>         |
| MAS | <b>*kw</b>         | ( <b>*g ?</b> )    | <b>*ngw</b>          | <b>*ɲw</b>         |
| MEF | <b>*kp</b>         | <b>*?</b>          | <b>*ngb ?</b>        |                    |
| SBB | <b>*kp</b>         | <b>*gb</b>         | ( <b>*ngb ?</b> )    | <b>*ɲm</b>         |

How should we characterize these formulas at the CSD level? In other words, which is the most likely source, **[kp]** or **[kw]**, for both labialized velar stops and labial-velar stops? There seem to be two kinds of approach to this question.

The first one is of an articulatory nature. Okoth Okombo (*pers. comm.*) argues that the coarticulations of **kp**, which do not share any common feature (**k** ‘velar’, **p** ‘labial’), are “not so peaceful (more marked)” while the ones of **kw**, which do share a common feature (**k** ‘velar’, **w** ‘labial+velar’), are “a bit more peaceful (less marked)”. The change **kp > kw** seems to him more likely than **kw > kp** and he therefore suggests a **\*kp** proto-form.

The second approach is of a more areal-comparative and historical-sociolinguistic nature. Commenting on some areal features of African languages, Greenberg (1983: 8) claims that “[...] coarticulated labiovelars [i.e. sounds of the **kp** type] are basically a Niger-Congo feature” and he later suggests that “from Niger-Congo these sounds spread at an early date to

<sup>6</sup> These articulatory definitions are taken from Ladefoged & Maddieson 1996.

Central Sudanic in the Nilo-Saharan family probably from Adamawa-Eastern”. This is also the opinion of Gerrit Dimmendaal (*pers. comm.*), who argues that “hardening processes of this type [i.e. **\*kw** > **kp**, **\*gw** > **gb** and **\*ɲw** > **\*ɲm**] are also attested in Eastern Nilotic languages belonging to the Bari group as well as Western Nilotic Alur. [... labial-velars...] emerged in these Nilotic languages under strong influence (and bilingualism) with neighbouring Central Sudanic languages”. He finally suggests that similar changes may have occurred within Central Sudanic through contact with Adamawa-Ubangi.

I agree with the idea that Central Sudanic labial-velar stops may have originated in contact with (pre-)Adamawa-Ubangi languages but, if so, I would claim that this change occurred, as Greenberg says, “at an *early* date” (my emphasis). Greenberg also states that “the sounds under discussion are surely not to be posited for proto-Nilo-Saharan although they may well be proto-Central Sudanic”. Indeed I find it hard to reconcile the hypothesis of relatively recent, individual changes from a CSD **\*kw** to **\*kp** in any subgroup with the fact that the MMD and MAS languages, which are closer to neighbouring Ubangi languages (Mundu, Zande, Mayogo, Mba), have **\*kw** reflexes while LND, which is not in contact with Ubangi, has **\*kp** reflexes. It seems to me more likely that the common Central Sudanic system already had labial-velar stops (**\*kp** etc.), which then ‘softened’ to labialized velar stops (**\*kw**) in MMD and in MAS. Both subgroups nevertheless show instances of labial-velar stops which are not reflexes of the common formulas and may be due to lexical rebuildings or innovations.

## 8. CONCLUSION

Despite the gaps in most comparative series and the unsolved problems involving vowels, there seem to be some solid arguments in favor of reconstructing labiovelars from cognates in MMD, LND, MAS, MEF and SBB, thus supporting the historical unity of these subgroups at a CSD level.

However instances of labial-velar stops in the modern languages do not necessarily represent reflexes of the CSD formulas **\*kp**, **\*gb**, **\*ngb** and **\*ɲm**, which may have given labialized velars, labial fricatives or alveolar affricates according to language and phonemic environment.

Lastly the characterization of these formulas as labial-velar rather than labialized velar stops seems to me the best way to account for the nature and distribution of their current reflexes.

## REFERENCES

- BENDER, L. M. (1992) Central Sudanic segmental and lexical reconstructions; *AAP*, 29, 5-61.
- BOONE, D. & R. L. WATSON (1996-1998) *Moru-Ma'di Survey Report*, Nairobi: SIL Electronic Survey Reports (<http://www.sil.org/silesr/1999/001/mmsurvey-w97.pdf>).
- BOYD R. (n.d.) *Questionnaire d'Inventaire Linguistique*: kreish. [unpublished manuscript]

- BOYELDIEU P. (2000) *Identité tonale et filiation des langues sara-bongo-baguirmiennes (Afrique centrale)*. Köln: Rüdiger Köppe (SUGIA, Beiheft 10).
- BOYELDIEU P. & P. NOUGAYROL (to appear) Les langues soudaniques centrales : essai d'évaluation. In: M. BECHHAUS-GERST, D. IBRISZIMOW & R. VOSSEN (Eds), *Problems of Linguistic-Historical Reconstruction in Africa*. Köln: Rüdiger Köppe (SUGIA, Beiheft 19).
- BOYELDIEU, P., P. NOUGAYROL & P. PALAYER (in preparation) *Lexique comparatif historique des langues sara-bongo-baguirmiennes*.
- CRAZZOLARA, J.P. (1960) *A Study of the Logbara (Madi) Language: Grammar and Vocabulary*. London: O.U.P. for I.A.I.
- DEMOLIN, D. (1992) *Le mangbetu, Etude phonétique et phonologique*. Thèse de doctorat, Université Libre de Bruxelles (Faculté de Philosophie et Lettres), vol. 2.
- DHEJJU, L. (1977) *Documents sur la langue lendu, Dialecte thadha (République du Zaïre)*. Diplôme de l'EPHE (IVème section), Paris.
- DIMMENDAAL, G. J. (1986) Notes on Avokaya; *Afrikanistische Arbeitspapiere (Köln)*, 6, 5-33.
- EHRET, C. (1992), *A Provisional Reconstruction of the consonants and vocabulary of Proto-Central-Sudanic*, 2 vol. [unpublished manuscript]
- GREENBERG J.H. (1963) Languages of Africa; *International Journal of American Linguistics*, 29, 1, part II. [(1966<sup>2</sup>) *The Languages of Africa*. Indiana University, Bloomington: La Haye, Mouton]
- (1983) Some Areal Characteristics of African Languages. In: I.R. DIHOFF (Ed.), *Current Approaches to African Linguistics*, vol. 1. Dordrecht: Foris Publications, 3-21.
- KUTSCH LOJENGA, C. (1994) *Ngiti, A Central-Sudanic language of Zaire*. Köln: Rüdiger Köppe (Nilo-Saharan 9).
- LADEFOGED, P. & I. MADDIESON (1996) *The Sounds of the World's Languages*. Oxford, UK-Cambridge, Mass.: Blackwell.
- LAROCLETTE, J. (1958) *Grammaire des dialectes Mangbetu et Medje (suivie d'un manuel de conversation et d'un lexique)*. Tervuren: Annales du Musée Royal du Congo Belge (Sciences de l'Homme/Linguistique 18).
- SANTANDREA, S. (1976) *The Kresh Group, Aja and Baka languages (Sudan)*. Napoli: Istituto Universitario Orientale.
- TUCKER, A.N. (1940) *The Eastern Sudanic Languages*, vol. 1. London-New York-Toronto: OUP for IALC.
- TUCKER A.N. & M.A. Bryan (1956) *The Non-Bantu Languages of North-Eastern Africa (with a Supplement on The Non-Bantu languages of Southern Africa by E.O.J. Westphal)*. London-New York-Cape Town: OUP for IAI.
- (1966) *Linguistic Analyses, The Non-Bantu Languages of North-Eastern Africa*. London-New York-Cape Town: OUP for IAI.
- VALLAEYS, A. (1986) *Dictionnaire logo-français, suivi d'un index français-logo*. Tervuren: Musée Royal de l'Afrique Centrale.



- VORBICHLER, A. (1965) *Die Phonologie und Morphologie des Balese (Ituri-Urwald, Kongo)*. Glückstadt: Verlag J.J. Augustin.
- (1969) Neue Forschungsergebnisse zur phonologischen Analyse des Balese-Obi; *Afrika und Uebersee*, 52, 144-45.
- (1971) *Die Sprache der Mamvu*. Hamburg: Verlag J.J. Augustin.

|               |  |
|---------------|--|
|               |  |
| CSD           | <b>CENTRAL SUDANIC</b>   |
| MMD           | <b><i>Moru-Madi</i></b>  |
| Miza          | Tucker 1940 / Boone & Watson 1996-98 (BW)                        |
| Moru-ägi      | Tucker 1940 / Boone & Watson 1996-98 (BW)                        |
| Moru-ändri    | Tucker 1940 / Boone & Watson 1996-98 (BW)                        |
| Ojila         | Tucker 1940 / Boone & Watson 1996-98 (BW)                        |
| Avokaya V     | Vallaes 1986   |
| Logo          | Tucker 1940 / Boone & Watson 1996-98 (BW)                        |
| Logo V        | Vallaes 1986   |
| Keliko        | Tucker 1940 / Boone & Watson 1996-98 (BW)                        |
| Lugbara       | Tucker 1940 / Boone & Watson 1996-98 (BW)                        |
| Lugbara C     | Crazzolaro 1960  |
| Ugandan Ma'di | Boone & Watson 1996-98 (BW)                                      |
| Lokai         | Tucker 1940 / Boone & Watson 1996-98 (BW)                        |
| Lulu'ba       | Tucker 1940 / Boone & Watson 1996-98 (BW)                        |
| LND           | <b><i>Lendu</i></b>  |
| Ngiti         | Kutsch Lojenga 1994  |
| Djadha        | Kutsch Lojenga 1994  |
| Lendu D       | Dhejju 1978  |
| Ddradha       | Kutsch Lojenga 1994  |
| MAS           | <b><i>Mangbetu(-Asua)</i></b>                                    |
| Aka           | Larochette 1958  |
| Asua L        | Larochette 1958  |
| Asua D        | Demolin 1992   |
| Mangbetu L    | Larochette 1958  |
| Mangbetu D    | Demolin 1992   |
| Lombi L       | Larochette 1958  |
| Lombi D       | Demolin 1992   |
| MEF           | <b><i>Mangbutu-Efe</i></b>                                       |
| Mamvu         | Vorbichler 1971  |
| Lese          | Vorbichler 1965, 1969  |
| KRS           | <b><i>Kresh</i></b>  |
| Kreish B      | Boyd (n.d.)  |
| Kreish S      | Santandrea 1976  |
| Dongo         | Santandrea 1976  |
| Aja           | Santandrea 1976  |
| SBB           | <b><i>(Sara-)Bongo-Bagirmi</i></b>                               |
|               | Boyeldieu 2000 / Boyeldieu, Nougayrol & Palayer (in preparation) |

Table 1. Language grouping and sources

| CSD        | *VCV     | *kp             | *gb                   | *ngb             | *ɲm       |
|------------|----------|-----------------|-----------------------|------------------|-----------|
| MMD        | *(V)CV   | *kw-a/E/i       | *gw-ε/i, (*g-u ?)     | *ngw             | *ɲw-a/u   |
| Miza       | ((C)V)CV | kw-a, tsw-ε/i   | dzw-ε, dʒw-i, (g-u ?) | ɲgw-a, ndʒw-ε    | ɲw-a, m-u |
| Moru-ägi   | ((C)V)CV | kw-a, tsw-ε/i   | dz-ε, dʒ-i, (g-u ?)   | ɲgw-a, ndzw-ε    | ? , m-u   |
| Moru-ändri | ((C)V)CV | f               | v, (g-u ?)            | mv               | ɲw-a, m-u |
| Ojila      | ((C)V)CV | f               | v, (g-u ?)            | mv               |           |
| Avokaya V  | ((C)V)CV | f               | v, (g-u ?)            | mv               | ɲ-a, m-u  |
| Logo       | ((C)V)CV | f               | v, (g-u ?)            | mv               | ɲw-a, m-u |
| Logo V     | ((C)V)CV | f               | v, (g-u ?)            | mv               | ? , m-u   |
| Keliko     | ((C)V)CV | f               | v, (g-u ?)            | mv               | ? , ny-u  |
| Lugbara    | ((C)V)CV | f               | v, (g-u ?)            | mv               | ny        |
| Lugbara C  | ((C)V)CV | f               | v, (g-u ?)            | mv               | ɲ         |
| Ug. Ma'di  | ((C)V)CV | hw-a, kw-ε/i    | gw, (g-u ?)           | ɲgw ?            | ɲ-u ~ m-u |
| Lokai      | ((C)V)CV | kw              | gw, (g-u ?)           | ɲgw              | ɲ         |
| Lulu'ba    | ((C)V)CV | kw              | gw, (g-u ?)           | ɲgw              | ɲ         |
| LND        | *VCV     | *kp (/ts ?)     | *gb (/dz ?)           | *ngb (/ndz ?)    | *ɲm       |
| Ngiti      | (V)CV    | kp, (ts ?)      | gb, (dz ?)            | ngb, (nz ?)      | m         |
| Djadha     | CV       | kp, (ts ?)      | gb                    | ngb, (nz ?)      | m         |
| Lendu D    | CV       | kp, (ts ?)      | gb, (dz ?)            | ngb, (ndz ?)     | m         |
| Ddradha    |          | kp, (ts ?)      | gb                    | ngb              | ɲ         |
| MAS        | *VCV     | *kw-a/ε         | *g ?                  | *ngw-a/ε         | *ɲw-a/ε ? |
| Aka        | ((C)V)CV | kw-ε            |                       | ɲgw-a/ε          |           |
| Asua L     | ((C)V)CV | kw-ε            |                       | ɲgw-a/ε          |           |
| Asua D     | ((C)V)CV | kw-a/ε          | g ?                   | ngw-a/ε          | mw ?      |
| Mangbetu L | (C)V)CV  | w/ø-a           | g ?                   | ngw-a/ε          | mu ?      |
| Mangbetu D | (C)V)CV  | w/ø-a           | g ?                   | ngw-a/ε          | mw ?      |
| Lombi L    | (C)V)CV  | kw-a/ε          |                       | ɲgw-a/ε          |           |
| Lombi D    | (C)V)CV  | xw-a/ε, (h-o ?) | g ?                   | ngw-a/ε          | ɲw ?      |
| MEF        | *(C)V)CV | *kp             | *? / *g-u ?           | *ngb ?           |           |
| Mamvu      | (C)V)CV  | f               | ? / g-u ?             | ngb/ng (-a/-U) ? |           |
| Lese       | (C)V)CV  | gb (qp 69)      | ? / g-u ?             | gb ?             |           |
| KRS        |          |                 |                       |                  |           |
| Kreish B   | (C)V)CV  | kp ?            |                       |                  | ɲ ?       |
| Kreish S   | (C)V)CV  | kp ?            | gb ?                  |                  | ɲ ?       |
| Dongo      | (C)V)CV  | kp ?            | b ?                   |                  | ɲ ?       |
| Aja        | (C)V)CV  | c-i ?           | j-i ?                 |                  |           |
| SBB        | *(C)V)CV | *kp             | *gb (/g-u ?)          | (*ngb ?)         | *ɲm       |

Table 2. Intermediate and actual reflexes of CSD main word-shapes and labiovelar formulas

|              | 1.<br>clean, (shave) <sup>7</sup>  | 2.<br>bone <sup>8</sup>         | 3.<br>man, male <sup>9</sup> | 4.<br>play/game/song <sup>10</sup>                    |
|--------------|--|---------------------------------|------------------------------|---|
| CSD          | <b>*kp</b>   | <b>*kp</b>                      | <b>*kp</b>                   | <b>*kp</b>  |
| MMD          | <b>*kw</b>   | <b>*kw</b>                      |                              |   |
| Miza         | ɔkɔ (BW)   | kɔwà                            |                              |   |
| Moru-ägi     | akwa (BW)  | kwa                             |                              |   |
| Moru-ändri   | ɔfa (BW)   | fà                              |                              |   |
| Ojila        |  | fà                              |                              |   |
| Avokaya V    | a. fā ; b. fò(à)   | fà                              |                              |   |
| Logo         | fa   | fà                              |                              |   |
| Logo V       | a. fā ; b. fò(à)   | fà                              |                              |   |
| Keliko       | fa   | fà                              |                              |   |
| Lugbara      | ufa  | fa                              |                              |   |
| Lugbara C    | a. fā ; b. òfā ;<br>c. fā ; d. òfá   | fà ~ fàlá(-kó)                  |                              |   |
| Ug. Ma'di    |  | hwa (BW)                        |                              |   |
| Lokai        | kwá  | kwà                             |                              |   |
| Lulu'ba      |  | kwà                             |                              |   |
| LND          | <b>*kp</b>   | <b>*kp</b>                      | <b>*kp</b>                   | <b>*kp</b>  |
| Ngiti        | a. ìkpà ; b. ìkpá  | a. -kpā ; b. -kpḏ               | a. ākpā ; b. -ākpà           | ìkpā  |
| Djadha       |  | a. -kpà ; b. -kpā               |                              | kpà   |
| Lendu D      | kpà 'raser'  | a. kpà ; b. kpā                 | kpà                          | a. kpā ; b. kpà                                       |
| Ddradha      |  | -kpālā                          |                              |   |
| MAS          | (*kw ?)  | (*kp ?)                         | *kw                          | *kw   |
| Aka          |  | (kpɔè ?)                        |                              |   |
| Asua L       |  | (kpɔ́ɔ̀è ?)                     |                              |   |
| Asua D       |  | (kpɔ̀è/kpɔ́ ?)                  | àkwàè                        |   |
| Mangbetu L   | (a. -èéwó<br>/nééwèèwò ?) ;<br>b. -òwá/nòwòwà                                    | (nékpɔ̀è/èkpɔ́ ?)               |                              | -òwà/nòwà   |
| Mangbetu D   |  | (nékpɔ̀è/èkpɔ́ ?)               |                              | (nɔ́và 'jouer' ?)                                     |
| Lombi L      |  | (nékpɔ̀è/èkpɔ́ ?)               | nákwáákpò                    |   |
| Lombi D      |  | (nékpɔ̀è/èkpɔ́ ?)               | nàxwáákpò<br>/àxwáákpó       | a. nòxwà/òxwà ;<br>b. nóxwà/òxwá                      |
| MEF          | <b>*kp</b>   | <b>*kp</b>                      | <b>*kp</b>                   |   |
| Mamvu        | ɬàfā   | ífū                             | áfū                          |   |
| Lese         | àgbá (àqpa 69)   | úgbī ~ ígbī<br>(úqpī ~ íqpī 69) | àgbī (áqpī 69)               |   |
| KRS          |  |                                 |                              |   |
| Kreish B     | (kpó (òkpó ?))   | kpòkpó                          |                              |   |
| Kreish S     |  | kpɔ́kpɔ́                        |                              |   |
| Dongo        |  | kpokpò                          |                              |   |
| Aja          |  |                                 |                              |   |
| SBB          | <b>*kp</b><br><b>*ukpe</b><br>(*C~*D1~*D2?)<br>'ébrancher, effeuiller,<br>raser' |                                 |                              | <b>*kp</b><br><b>*(?)ukpa</b><br>(*OCC*12)<br>'chant' |
| distribution | [1]  |                                 |                              | [3]   |

<sup>7</sup> Avokaya V/Logo V: a. 'gratter, raser', b. 'gratter, érafler'; Lugbara C: a. 'cut (hair), grub (up), scrape, rake', b. 'scrape, rasp, scratch and clean away', c. 'clean, cut, trim, dress surface of something', d. 'clean off (all surface unevenness of sth.)'; Ngiti: a. 'weed', b. 'dig up with the hoe'; Mangbetu L: a. 'balayer, nettoyer', b. 'faire disparaître, effacer'; Mamvu/Lese: 'fegen'; Kreish B: 'gratter'.

<sup>8</sup> Compare 3.man, male? Ngiti/Djadha: a. 'os', b. 'fruit'; Lendu D: a. 'os', b. 'graine'.

<sup>9</sup> Ngiti: a. 'husband', b. 'male, long'.

<sup>10</sup> Ngiti: 'play, game'; Djadha: 'play'; Lendu D: a. 'jouer', b. 'jeu'; Mangbetu L: 's'ébattre, jouer, pagayer'; Lombi D: a. 'danser', b. 'jeu'; SBB: 'chant'.

|  | 5.<br>paddle (v.) <sup>11</sup>   | 6.<br>warana (lizard)                                 | 7.<br>tree   | 8.<br>bowels   |
|--|---|---|--|--|
| CSD  | <b>*kp</b>  | <b>*kp</b>  | <b>*kp</b>   | <b>*kp/*k ?</b>  |
| MMD<br>Miza<br>Moru-ägi<br>Moru-ändri<br>Ojila<br>Avokaya V<br>Logo<br>Logo V<br>Keliko<br>Lugbara<br>Lugbara C<br>Ug. Ma'di<br>Lokai<br>Lulu'ba |   | <b>*kw</b> 'WARANA'<br>letswe<br>tswa<br>lufe<br>lefe | <b>*kw</b><br>kyè ~ tswè<br>tswe<br>fè<br>fè<br>fe, fa<br>fa<br>fe, fa<br>fa<br>fè<br>fè<br>kwe (BW)<br>kwe<br>kwe | <b>*kw</b><br>utswí<br>utsí<br>ufí, ofí<br>fî<br>fi(á)<br>fí<br>fi(á)<br>(t)fi<br>fî, ift<br>fî<br>ikwí (BW)<br>ikwí<br>ukwí |
| LND<br>Ngiti<br>Djadha<br>Lendu D<br>Ddradha   |   | <b>*kp</b><br>ũkpé 'alligator'<br><br>kpé 'pangolin'  | <b>*ts</b><br>ĩtsū<br>tsú<br>tsú<br>tsɔw   | <b>*ts</b><br>-tsū   |
| MAS<br>Aka<br>Asua L<br>Asua D<br>Mangbetu L<br>Mangbetu D<br>Lombi L<br>Lombi D   | <b>*kw</b><br><br>-òwà/nòwà   |   | ( <b>*kw ?</b> )<br><br><br><br><br><br><br>(néhò/éhó ?)   | <b>*k ?</b><br>ekyü<br>èkyü<br>ìkí/ìkí<br>nèkí/èkí<br>nèkí/èkí<br>ékí<br>nèkí/èkí  |
| MEF<br>Mamvu<br>Lese   | <b>*kp</b><br>(òfà ?)<br>(ògbà (òqpà 69) ?)   |   | <b>*kp</b><br>òfà<br>ògbà (òqpà 69)  |  |
| KRS<br>Kreish B<br>Kreish S<br>Dongo<br>Aja  |   |   | kpīkpī<br>kpikpi<br>kpikpi<br>cící   | (tòfò ?)<br>(tòfo ?)   |
| SBB<br><br>distribution  | <b>*kp</b><br><b>*ukpa ?</b><br>(*OCC*AB ?)<br>'conduire une pirogue'<br>[5/+gs] ([2a] ?) |   |  | <b>*kp</b><br><b>*tikpi/*tukpe/</b><br><b>*tEkpE (*12)</b><br><br>[1]  |

<sup>11</sup> Mangbetu L: 's'ébattre, jouer, pagayer'; Mamvu/Lese: 'abzweigen vom Weg, um einzukehren' but see also Lese òfà 'das Boot mit Stangen stossen', which does not agree with **\*kp!**

|                     | 9.<br>seed, grain <sup>12</sup>          | 10.<br>give <sup>13</sup> | 11.<br>bite, gnaw     | 12.<br>hen, chicken     |
|---------------------|--|---------------------------|-----------------------|-------------------------|
| CSD                 | <b>*kp</b>                               | <b>*kp ?</b>              | <b>*kp/*k</b>         |                         |
| MMD                 | <b>*kw</b>                               | <b>*kw</b> 'GIVE' / 'PAY' | <b>*kw</b>            |                         |
| Miza                | <b>ketswi</b>                            |                           | <b>ɔ-kwa</b>          |                         |
| Moru-ägi            | <b>ketswi</b>                            | <b>(ɛ)tse / atswɛ</b>     |                       |                         |
| Moru-ändri          | <b>ɛfi</b>                               | <b>- / ɔfɛ</b>            | <b>ɔ-fá</b>           |                         |
| Ojila               | <b>ɛfla</b>                              | <b>afɛ / fɛ</b>           |                       |                         |
| Avokaya V           | <b>ífi</b>                               | <b>- / fɛ</b>             |                       |                         |
| Logo                | <b>(nya)kífya</b>                        | <b>fɛ / fɛ</b>            |                       |                         |
| Logo V              | <b>kífi ~ kísí</b>                       | <b>- / fɛ</b>             |                       |                         |
| Keliko              | <b>tft</b>                               | <b>fɛ / ufɛ</b>           | <b>fa</b>             |                         |
| Lugbara             | <b>(ànya)tft</b>                         | <b>tfe / ufɛ</b>          |                       |                         |
| Lugbara C           |  | <b>fɛ ~ èfɛ / -</b>       |                       |                         |
| Ug. Ma'di           | <b>éhwí (BW)</b>                         | <b>hwe / - (BW)</b>       |                       |                         |
| Lokai               | <b>(kwě)kwí</b>                          | <b>eke / úkwe</b>         |                       |                         |
| Lulu'ba             | <b>kweníakwí</b>                         | <b>ekwé / -</b>           |                       |                         |
| LND                 | <b>*ts</b>                               |                           | <b>*k</b>             |                         |
| Ngiti               | <b>ĩtsē</b>                              |                           | <b>ōkā</b>            |                         |
| Djadha              | <b>tsī</b>                               |                           | <b>kà</b>             |                         |
| Lendu D             | <b>tsē</b>                               |                           | <b>kà</b>             |                         |
| Ddradha             | <b>tsī</b>                               |                           | <b>kà</b>             |                         |
| MAS                 | <b>(*kw ?)</b>                           | <b>(*kw ?)</b>            | <b>*k</b>             | <b>*kw</b>              |
| Aka                 |  |                           |                       | <b>àkwélè</b>           |
| Asua L              |  |                           |                       | <b>àkwéléè</b>          |
| Asua D              |  | <b>(òkjòkjò/kòkjò ?)</b>  | <b>kókàè</b>          | <b>ákwéléè/ákwélé</b>   |
| Mangbetu L          |  | <b>(-òwò/nówò ?)</b>      | <b>-ò'ká/nó'kó'ká</b> | <b>nálé/álé</b>         |
| Mangbetu D          |  | <b>(nòò/kùò ?)</b>        | <b>nòkà</b>           | <b>nálé/álé</b>         |
| Lombi L             |  |                           |                       | <b>nákwéléédre</b>      |
| Lombi D             | <b>(nixübù/ixübù ?)</b>                  | <b>(nòhò ?)</b>           | <b>nòkà</b>           | <b>nàxwéléé/àxwéléé</b> |
| MEF                 | <b>*k-i ?</b>                            |                           | <b>*k</b>             |                         |
| Mamvu               | <b>sésí</b>                              |                           | <b>òqò</b>            |                         |
| Lese                | a. <b>héhí ~ éhí ;</b><br>b. <b>tísí</b> |                           | <b>ràhó ; tãhó</b>    |                         |
| KRS                 |  |                           |                       |                         |
| Kreish B            |  |                           |                       |                         |
| Kreish S            |  |                           |                       |                         |
| Dongo               |  |                           |                       |                         |
| Aja                 |  |                           |                       |                         |
| SBB<br>distribution |  |                           |                       |                         |

<sup>12</sup> Lese: a. 'Frucht, Kern', b. 'Semen virile, menschlicher Same'.

<sup>13</sup> MMD: two different verbs (derived from each other?): 'give' / 'pay'.

|  | 13.<br>cough (v.)   | 14.<br>strong/hard/firm <sup>14</sup>  |
|--|---|--|
| CSD  |   |  |
| MMD<br>Miza<br>Moru-ägi<br>Moru-ändri<br>Ojila<br>Avokaya V<br>Logo<br>Logo V<br>Keliko<br>Lugbara<br>Lugbara C<br>Ug. Ma'di<br>Lokai<br>Lulu'ba | *kp ?<br>ēkpī<br>ā kpī<br>ēkpē<br>kpu<br>ūkpú<br><br>kīkpí                    | *kp ?<br><br>kpəkpo 'difficult'<br><br>ðkpò 'strength, power'<br><br>ɔkpó 'hard, strong, difficult'  |
| LND<br>Ngiti<br>Djadha<br>Lendu D<br>Ddradha   | *kp<br>īkpè<br>kpì<br>kpè<br>(hwì ?)  | kpākpà 'dureté, force' ; kpákpá 'fort'   |
| MAS<br>Aka<br>Asua L<br>Asua D<br>Mangbetu L<br><br>Mangbetu D<br><br>Lombi L<br>Lombi D   | *k<br><br>kékìjè<br>-è'kí/né'kìè'kì<br><br>nèkjéki/kéki<br><br>nèkítíki/èkítí | *kp ?<br><br>-èkpwára/nèkpwèkpwarà 'être fort, fortifier' ; -èèkpwá/<br>néèkpwèèkpwò 'résister' ; mèkpwákpwára 'dur' ; nèkpàkpàará<br>'force' ; -èkpwákálá 'être obstrué, impraticable, difficile' ; -<br>àákpwáága/náákpwààkpwààgà 'devenir difficile, impossible'<br>mèkpàkpàálá 'difficile' ; mèkpàkpàárá 'fort' ; nèkpàkpàárá<br>'force' |
| MEF<br>Mamvu<br>Lese   |   | (gbāngá ?)<br>(hègbā ?)  |
| KRS<br>Kreish B<br>Kreish S<br>Dongo<br>Aja  | ékpé  | aka  |
| SBB<br>distribution  |   |  |

<sup>14</sup> Compare 2.bone and 3.man, male? Mamvu/Lese: 'gross, gewaltig'.





|  | 18.<br>wash oneself   | 19.<br>scratch, (pinch) <sup>17</sup>   | 20.<br>laugh (v.)  | 21.<br>steal   |
|--|---|---|--|--|
| CSD  | <b>*gb ?</b>  | <b>*gb/*g</b>   | <b>*gb (/ *g ?)</b>  | <b>*g/*gb</b>  |
| MMD<br>Miza<br>Moru-ägi<br>Moru-ändri<br>Ojila<br>Avokaya V<br>Logo<br>Logo V<br>Keliko<br>Lugbara<br>Lugbara C<br>Ug. Ma'di<br>Lokai<br>Lulu'ba |   | <b>*gw</b><br><br><br><b>vè (BW)</b><br><b>vè</b><br><b>vè (BW)</b><br><b>vè</b><br><b>vè (BW)</b><br><b>vì (BW)</b><br><b>vì ~ òvì</b><br><b>gwì (BW)</b><br><b>gwi (BW)</b> | <b>*g</b><br><b>u-gu(gù)</b><br><b>u-gu(gù)</b><br><b>u-gu</b><br><b>gù</b><br><b>gū</b><br><b>gù</b><br><b>gū</b><br><b>gù</b><br><b>gù</b><br><b>gū</b><br><b>gū (BW)</b><br><b>gu</b><br><b>agu</b> | <b>*g</b><br><b>kugu</b><br><b>kugu</b><br><b>ugù</b><br><b>ugu</b><br><b>ūgù</b><br><b>kúgù</b><br><b>kūgù</b><br><b>úgù</b><br><b>úgù</b><br><b>ògù</b><br><b>ogu (BW)</b><br><b>ogù</b><br><b>ugu</b> |
| LND<br>Ngiti<br>Djadha<br>Lendu D<br>Ddradha   | <b>*gb</b><br><br><br><b>gbǎ</b>  | <b>*dz</b><br><b>ōdzō</b><br><br><b>dzà</b>   | <b>*gb</b><br><b>ōgbó</b><br><b>gbò</b><br><b>gbō</b><br><b>gbù</b>  | <b>*gb</b><br><b>ōgbō</b> 'theft'<br><br><b>gbò</b> 'vol'  |
| MAS<br>Aka<br>Asua L<br>Asua D<br>Mangbetu L<br>Mangbetu D<br><br>Lombi L<br>Lombi D   |   | <b>*g ?</b><br><br><br><b>ògògùè</b><br><b>-ògù(ndrè)/nógù</b><br>a. <b>nògù/kùgù</b> ;<br>b. <b>nóvò ?</b><br><br><b>nògù/ògù</b>  |  | <b>*g ?</b><br><br><br><b>éégègè/kéégù</b><br><b>-ègù/néégùègù</b><br><b>néégwéégù/kéégù</b><br><br><b>nègúúgù</b>   |
| MEF<br>Mamvu<br>Lese   |   | <b>*g ?</b><br><b>ōgú</b><br><b>òkū</b>   |  |  |
| KRS<br>Kreish B<br>Kreish S<br>Dongo<br>Aja  |   |   |  |  |
| SBB<br><br>distribution  | <b>*gb</b><br><b>*igbo/*OgbO</b><br>(*C~*D1~*D2?) 'laver'<br>[2a] ([1] ?) | <b>*g</b><br><b>*ugu (*D1)</b><br>'gratter, pincer'<br>[1]  | <b>*gb</b><br><b>*OgbO/*igbo/</b><br><b>*EgbE (*A)</b><br>[1]  | <b>*g</b><br><b>*fOgO/*mOgO</b><br>(*D1?)<br>[1]   |

<sup>17</sup> Ngiti/Lendu D: 'pinch/pincer'; Mangbetu D: a. 'se gratter', b. 'égratigner'; Mamvu/Lese: 'ausgraben, scharren'.

|  | 22.<br>egret   | 23.<br>bark (v.)   | 24.<br>child  |
|--|--|--|---|
| CSD  |  |  | <b>*ngb</b>   |
| MMD<br>Miza<br>Moru-ägi<br>Moru-ändri<br>Ojila<br>Avokaya V<br>Logo<br>Logo V<br>Keliko<br>Lugbara<br>Lugbara C<br>Ug. Ma'di<br>Lokai<br>Lulu'ba |  | <b>*gb ?</b><br><b>ogbo, ɔgbɔ</b> (BW)<br><b>ɔgbɔ</b> (BW)<br><b>ɔgbɔ</b> (BW)<br><b>āgbù</b> (BW)<br><b>āgbù</b><br><b>Ágbū</b> (BW)<br><b>āgbù</b><br><b>(āfò, afòfò)</b> (BW) ?<br><b>àgbò</b> (BW)<br><b>àgbò ~ ēgbé</b><br><b>gbo</b> (BW)<br><b>gbo</b> (BW)<br><b>ìgbò</b> (BW) | <b>*ngw</b><br><b>ḡgwā</b><br><b>drìàngwa</b><br><b>m̄vā</b><br><b>mva</b><br><b>mvá</b><br><b>mvá(mv́)</b><br><b>mvá</b><br><b>mvá</b><br><b>mvá</b><br><b>mvá</b><br><b>mva, bàrángwá</b> (BW)<br><b>'bàrangwa</b><br><b>ḡgwā</b> (BW)                |
| LND<br>Ngiti<br>Djadha<br>Lendu D<br>Ddradha   |  | <b>*gb ?</b><br><br><b>gbǒ</b> (child language)  | <b>*ngb / pl. *ndz</b><br><b>ṽngbā / pl. ṽnzō</b><br><b>ngbā</b><br><b>ngbā / pl. ndzō</b><br><b>ngbā</b>   |
| MAS<br>Aka<br><br>Asua L<br>Asua D<br>Mangbetu L<br><br>Mangbetu D<br>Lombi L<br>Lombi D   | <b>*gb ?</b><br><br><b>né'gbà/é'gbà</b> 'héron'<br><br><b>négbà</b> 'héron'  |  | <b>*ngw</b><br><b>angyána ; 'bangyána</b> (ḡgwáà<br>'bébé')<br><b>ḡgwángwa, àngyána</b><br><b>ngwángwà/ádžánà</b><br><b>nèngónguè~nènguáánguè~</b><br><b>náánguè/èdjáándré</b><br><b>néngwángwè/édžándré</b><br><b>nèngwáángwè</b><br><b>nèngwángwè</b> |
| MEF<br>Mamvu<br><br>Lese   | <b>(mārìgbángá</b> 'Kranich,<br>Storch' ?)   |  | <b>*ngb ?</b><br><b>ũngú (ōngú ?)</b> (pl. èndī, màtù)<br><br><b>ígbi, ígbi (?)</b> (also ádí/pl. àdī)  |
| KRS<br>Kreish B<br>Kreish S<br>Dongo<br>Aja  |  |  |   |
| SBB<br><br>distribution  | <b>*gb</b> (irreg.)<br><b>*Nigbo/*NOgbo</b><br><b>(/*?igbo/*?Ogbo ?)</b><br><b>(*OCC*11)</b><br>'marabou stork'<br><b>[4] ([2a] ?)</b> | <b>*gb</b> (irreg.)<br><b>*igbo/*Ogbo/*EgbE</b><br><b>(*B)</b><br><br><b>[1] ?</b>   |   |

|              | 25.<br>(be) white   | 26.<br>call   | 27.<br>outside, away <sup>18</sup>  | 28.<br>body/skin   |
|--------------|---|---------------|---|--|
| CSD          | <b>*ngb</b>   | <b>*ngb</b>   | <b>*ngb ?</b>   | <b>*ngb ?</b>  |
| MMD          | <b>*ngw</b>   | <b>*ngw</b>   | <b>*ngw</b>   |  |
| Miza         | ðndʒwɛ  |               |   |  |
| Moru-ägi     | andzwé  |               |   |  |
| Moru-ändri   | ðmve  |               | (ivè ?)   |  |
| Ojila        | amve  |               |   |  |
| Avokaya V    | mve (v.),<br>ēmvé(ro) (adj.)  |               | àmvē  |  |
| Logo         | (k)ɛmve   |               | amvena  |  |
| Logo V       | mve (v.),<br>kēmvé(ro) (adj.)   |               | àmvē  |  |
| Keliko       | (n)imve   |               | àmve  |  |
| Lugbara      | ímvē-rɔ   | mve           | àmve  |  |
| Lugbara C    | mvē   | ðmvē          | àmvé  |  |
| Ug. Ma'di    | ɥɔwē (BW)   |               |   |  |
| Lokai        | ɪŋgwi   | uŋgwe         | àŋgwe   |  |
| Lulu'ba      | aŋgwé   | uŋgwe         | àŋgwe   |  |
| LND          |   | <b>*ndz</b>   |   | <b>*ngb</b>  |
| Ngiti        |   | ānzī          |   | -ngbò 'body, exterior surface of sth.'                   |
| Djadha       |   | nzi           |   |  |
| Lendu D      |   | ndzī          |   |  |
| Ddradha      |   |               |   |  |
| MAS          | <b>*ngw</b> 'MOON'  | <b>*ngw ?</b> |   |  |
| Aka          | naŋgwê  |               |   |  |
| Asua L       | àŋgwéè  |               |   |  |
| Asua D       | ángwé   | òngòè/kùngò   |   |  |
| Mangbetu L   | nànguè/ánguè  | -òngó/nóngò   |   |  |
| Mangbetu D   | nángwé  | nòngò/kùngò   |   |  |
| Lombi L      | nààŋgwé   |               |   |  |
| Lombi D      | nángwé  | nòngwò/kùngwò |   |  |
| MEF          | <b>*ngb ?</b>   | <b>*ngb ?</b> |   | <b>*ngb ?</b>  |
| Mamvu        | ðngɔ̄ (v.),<br>qɔ̄ngò (adj.)  | àngū          | (rángá 'Wald' ?)  | īngbá 'Haut, Fell'                                       |
| Lese         | ègbà (n. & adj.)  |               | (rùgbā 'hinter (der Hütte), dahinter' ?)                                    | ègbā (ègbā 69)<br>'Haut, Fell' ; ògbā ~<br>ìgbā 'Körper' |
| KRS          |   |               |   |  |
| Kreish B     | (jóŋó ?)  |               |   |  |
| Kreish S     | (jɔŋɔ ?)  |               |   |  |
| Dongo        | ((a)jɔŋɔ ?)   |               |   |  |
| Aja          |   |               |   |  |
| SBB          | (*ŋm/*ɲ ? ?)<br>(*aŋmi/*OŋmI/<br>*api/*OpI ? (*A)<br>'être clair, blanc' ?) |               | (*ngb ?)<br>*(?)ingba/*(?)ungba<br>(*OCC*22) 'hôte,<br>voyage, étranger' ?) |  |
| distribution | [1]   |               | [1]   |  |

<sup>18</sup> Avokaya V/Logo V: 'cour, plaine; dehors, dans la cour'.



|  | 33.<br>rot, be rotten  | 34.<br>honey, (bee) <sup>20</sup>  | 35.<br>break <sup>21</sup>  |
|--|--|--|---|
| CSD  | <b>*ɣm/*m</b>  |  |   |
| MMD<br>Miza<br>Moru-ägi<br>Moru-ändri<br>Ojila<br>Avokaya V<br>Logo<br>Logo V<br>Keliko<br>Lugbara<br>Lugbara C<br>Ug. Ma'di<br>Lokai<br>Lulu'ba | <b>*ɣw ?</b><br><br><br><br><b>ɣō(ā)</b><br><br><b>ɣō(ā)</b>   | <b>*ɣw ?</b><br><br><br><br><br><b>ànyu</b><br><b>ànyu</b><br><b>àpú 'bee'</b><br><b>lapu, lamu (BW)</b><br><b>làḡó</b><br><b>làḡú 'bee'</b> | <b>*ɣw ?</b><br><b>(ɔ-ɣḡɔ ?)</b><br><b>(ɔ-ɣḡɔ ?)</b><br><b>(ɔ-ɣḡɔ ?)</b><br><b>ɣɔ</b><br><b>ɣò(à)</b><br><b>ɣwa</b><br><b>nyò, ɣò(à)</b><br><b>ɣɔ</b><br><b>nyú</b><br><b>àpò</b><br><br><b>ɣò</b><br><b>ɣɔɣɔ</b> |
| LND<br>Ngiti<br>Djadha<br>Lendu D<br>Ddradha   | <b>*ɣm</b><br><b>ɔmò</b><br><b>mò</b><br><b>mò</b><br><b>ɣò</b>  |  |   |
| MAS<br>Aka<br>Asua L<br>Asua D<br>Mangbetu L<br>Mangbetu D<br>Lombi L<br>Lombi D   | <b>*ɣw</b><br><br><br><b>mómwà (adj. ?)</b><br><b>-òmúá/nómúà</b><br><b>mómómwà (adj. ?)</b><br><br><b>mómḡwà (adj. ?)</b> |  |   |
| MEF<br>Mamvu<br>Lese   |  |  |   |
| KRS<br>Kreish B<br>Kreish S<br>Dongo<br>Aja  |  |  |   |
| SBB<br>distribution  | <b>*m</b><br><b>*nɖumu (*OCC*D)</b><br>[4]   |  |   |

<sup>20</sup> MMD: compare 32.fly? Moru forms of the **(k)omu-epɛ** type are probably to be understood as /fly/honey/.

<sup>21</sup> Avokaya V/Logo V: 'détacher, casser, plier'.

