

## Article

### *The Outcome of Afrasian Guttural Proto-Phonemes in Berber*

Arnaud Fournet

**Abstract:** Current approaches of Afrasian hold pharyngeals and laryngeals to have muted out in Berber. The article shows that pharyngeal phonemes have in fact become palatalized into \*s/z and \*š/ž in this group of languages. They have not disappeared but have changed their place of articulation. There exists a significant number of examples of these phonetic correspondences, which ultimately support the cognacy of Berber with Semitic and therefore with Afrasian in general. The hypothesis of a phonetic change: pharyngeal > palatal explains many phonological and morphological features of Berber languages.

**Keywords:** Berber, Afrasian, Palatalization, Pharyngeal, Laryngeal.

#### 1. *The Berber languages*

The Berber family is a genetic group with easily recognizable features from the morphological and phonetic point of view. In addition to the Tuareg branch in the south of the Berber-speaking area, there remains in Morocco a large percentage of Berber native speakers, who can be assigned to three main dialectal areas: *chleuh* (or *tachelhit*, *tasusit*) in south Morocco, *amaziy* (or *tamaziyt*) in the center and *rifian* (or *tarifit*) in the north. In Algeria, the main dialects are *kabyle* (or *taqbaylit*) and *chawi* (or *taçawit*) in the Aurès mountains. These dialects are still spoken by several million people on a daily and regular basis. Some vulnerable and isolated spots in Egypt, Libya, Tunisia and Mauritania still exist. The usual French tradition resorts to the word *dialect* rather than *language* to describe the different Berber idioms. I keep this word which is used by most Berberologists. In the rest of the article, I will add a capital letter to the names of the dialects as is usual in English.

##### 1.1. *The issue of Afrasian gutturals in Berber*

In sharp contrast with Arabic, which has a high number of laryngeal, pharyngeal and uvular phonemes, most Berber dialects do not have any of these “gutturals” in the inherited vocabulary. They usually appear only in Arabic loanwords. In Niger Tuareg, where the lexical influence of Arabic is weak, there is no laryngeal nor pharyngeal in the phonemic inventory. It can be noted that the ancient Tifinagh and Libyco-Berber alphabets do not seem to have any letter for <ʕ> /ʕ/, <ħ> /ħ/ or <ʁ> /ʁ/. According to Lionel Galand (1988:120):

Les textes de *Thugga* sont peut-être trop courts pour nous livrer tout l'alphabet libyque. Pourtant il paraît difficile d'attribuer au hasard l'absence très frappante des articulations d'arrière et l'on ne peut s'empêcher de remarquer, à ce propos, que le berbère actuel doit à des évolutions locales ou à des emprunts la plupart de ses pharyngales et de ses laryngales : dans cette zone d'articulation l'héritage chamito-sémitique aurait donc été perdu depuis longtemps.<sup>1</sup>

---

<sup>1</sup> The texts from *Thugga* may be too short to provide all letters of the Libyco-Berber alphabet. The striking absence of posterior articulations nevertheless can hardly be a chance coincidence and it must be noted that most pharyngeals and laryngeals in present-day Berber dialects are due to local developments or borrowings: phonemes inherited from Afrasian for this place of articulation are therefore likely to have been lost for a long time.

The widespread opinion is to consider that laryngeal and pharyngeal phonemes have disappeared and muted out in the Berber subgroup of Afrasian. In this article I will examine and challenge that point of view. My hypothesis is that the “gutturals”, especially the voiced and voiceless pharyngeals have not disappeared in Berber but have been palatalized. Because of this phonetic change, which is not at all equivalent to muting out, reflexes of Afrasian pharyngeals are now /s/ /z/ /š/ or /ž/ in the different Berber dialects. This hypothesis has a number of advantages :

- it identifies new cognates that have remained unnoticed so far, confirming that Berber belongs genetically to Afrasian,
- it explains some Tuareg emphatics which do not exist in the rest of Berber and which keep a phonological trace of the previous guttural articulation,
- it explains some morphological irregularities in some derivatives or in the paradigms of some verbs like ‘to eat’ and ‘to drink’.

### *1.2. The available documentation*

The field can be divided into three sub-branches:

- the eastern dialects, spoken in Egypt and eastern Libya,
- the southern or Touareg dialects, spoken in southwestern Sahara and the Sahel area,
- the northern dialects, in the Maghreb area, Morocco and Algeria for the most part.

The different “dialects” are not known with the same level of refinement and reliability. A survey of the currently available documentation is as follows <sup>2</sup> :

#### 1. Eastern Berber dialects:

- Augila (Libya) known thanks to Paradisi (1960)
- Siwa (Egypt) known thanks to Laoust (1932)

#### 2. Southern Berber (Touareg) dialects:

- Tahaggart (Algeria) very well known thanks to Foucault (1951) and Prasse (1960 & 1993)
- Tadaht (Mali) known thanks to Heath (2006) <sup>3</sup>
- Taneslemt (Mali) known thanks to Heath (2006)
- Tawellemmet (Niger) very well known thanks to Prasse (1998 & 2003)
- Tayrt (Niger) very well known thanks to Prasse (1998 & 2003)
- Zenaga (Mauritania) very well-known thanks to Taine-Cheikh (2008)

#### 3.1. Northern Berber dialects:

- Tachelhit (Morocco) very well known
- Tamaziɣt (Middle Moroccan Atlas) very well known thanks to Taifi (1991)
- Kabyle (Algeria) well known thanks to Dallet (1982)
- Chenoua (Algeria) known thanks to Laoust (1912)

#### 3.2. Northern Berber dialects of the zenati sub-group:

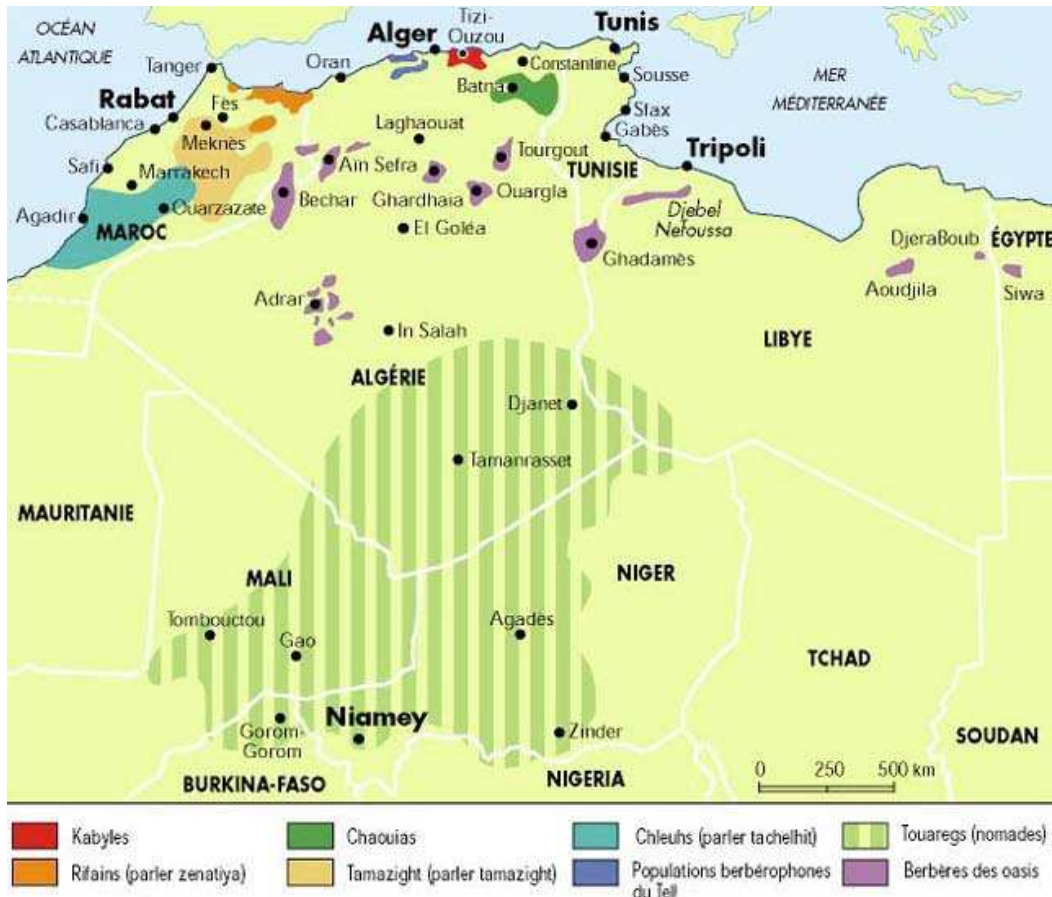
- Senhaja de Sraïr (Northern Morocco) well known thanks to Ibañez (1959)
- Ait Seghrouchen (Central Morocco) known thanks to Taifi (1991) and Pellat (1955)
- Beni Iznasen (Morocco) known thanks to Destaing (1914) and Renisio (1932)
- Tarifit (Morocco) well known thanks to Allati (1986) and Ibañez (1944)
- Beni Snous (Algeria) known thanks to Destaing (1914)
- Figig (Morocco, Algeria) well known thanks to Kossmann (1997) and Saa (1995)
- Mzab (Algeria) known thanks to Delheure (1984)

---

<sup>2</sup> I follow Kossmann (1999:26-29) with a number of additions and updates.

<sup>3</sup> Apparently, this is the only recent work on Berber ever done by an American. It follows the standard format of other Berber dictionaries and is written in French in order to be used in local schools in Mali.

- Wargli (Algeria) very well known thanks to Delheure (1984)
- Timimum (Algeria) known thanks to Boudot-Lamotte (1964)
- Beni Menacer (North-western Algeria) known thanks to Destaing (1914)
- Chawi (Algeria) well known thanks to Basset (1961)
- Metmata (Tunisia) known thanks to Destaing (1914)
- Ghat (Libya) unsecurely described in Nehlil (1909)
- Ghadames (Libya) well known thanks to Lanfry (1968 & 1973)
- Zuara (Libya) known thanks to Mitchell (1957)
- Efoqaha (Libya) known thanks to Paradisi (1963)
- Nefusa (Libya) well known thanks to Beguinot (1931) and Provasi (1973)



Map of the Berber “languages” according to S. Chaker (Inalco)

The Zenati sub-group of Northern Berber displays several innovations and morphological levelings that cannot be found in Tachelhit and in Kabyle, which makes these two dialects more conservative items than is usually assessed. It is incorrect to think that only Touareg is conservative. Moreover, it must be noted that the dictionary of Berber roots compiled by Kamal Nait-Zerrad is immensely useful for any comparative work involving Berber. Unfortunately, only the letters A to G have already been published. I have no opinion about the genetic relationship of Guanche.

### 1.3. *Emphasis in Berber*

A typical feature of Afrasian languages is the series of emphatic consonants, in contrast with voiced and voiceless series. Emphasis is glottalic in Ethiopic Semitic, pharyngeal in Arabic or uvular in Tuareg. In Niger Tuareg, but not in Tahaggart, the presence of an emphatic phoneme in a root or an affix triggers a complete spread of emphasis on the whole consonantal skeleton. I will note this feature with the sign <<sup>E</sup>>: for example, <sup>E</sup>*ismam* ‘bitter’ is [iʃ<sup>E</sup>mam] with three emphatics. In his dictionary of

Niger Tuareg, Karl Prasse notes <ismam> what I will write <sup>E</sup>ismam and attributes to /m/ the emphatic spread. As is shown below it is /s/ of pharyngeal origin the actual cause of emphasis in this word.

2. The Berber reflexes of Afrasian gutturals

Arabic and more generally Semitic display a complete set of gutturals: laryngeals \*ʔ and \*h, pharyngeals \*ħ and \*ʕ. Other branches like (Hieroglyphic) Egyptian show that this set must be reconstructed for Proto-Afrasian as well. This is for example the point of view expressed in Bomhard (2008:150): “Another significant characteristic is the presence of a glottal stop, a voiceless laryngeal fricative, and voiced and voiceless pharyngeal fricatives.” and (2008:169) “at the present time, only \*ʔ, \*h, \*ħ, \*ʕ can be firmly established for Proto-Afrasian.” I will follow this reconstruction of Afrasian. Another approach is to add a pair of velar fricatives \*ḡ [x] and \*ǵ [ɣ], but their existence as phonemes is hard to establish.<sup>4</sup>

The issue is to determine what these guttural proto-phonemes have become in Berber. As stated before, the traditional hypothesis is that they have muted out. Bomhard (2008:170) takes this hypothesis as reference for Nostratic. My own work identified three types of traces of inherited gutturals in Berber:

- explicit palatalized segments ,
- emphatics generated by contacts between voiceless consonants and pharyngeals,
- unexplained morphological alternation, such as *č* ~ *t(t)*.

The new sibilants generated by palatalized gutturals have sound correspondances that are different from those of the inherited sibilants throughout Berber dialects. In general the inherited sibilants \*s and \*z remained stable. The attested alterations are either palatalizations in the vicinity of \*i or emphatizations in southern Tuareg in that of \*u. On the contrary, previously pharyngeal phonemes that have become sibilants display a contrast between:

- \*z/ž in northern Berber and \*z in Tuareg for PA \*ʕ,
- \*s in northern Berber and \*š in Tuareg for PA \*ħ.

The diachronic origin of the sibilants can be summarized as follows:

| Proto-phoneme | Traditional hypothesis | Proposed hypothesis | Kabyle | Tawellemmet    |
|---------------|------------------------|---------------------|--------|----------------|
| *ʔ            | ∅                      | ∅                   | ∅      | ∅              |
| *h            | ∅                      | *z                  | z      | z              |
| *z            | *z                     | *z                  | z      | z              |
| *ʕ            | ∅                      | *ž                  | ž      | <sup>E</sup> z |
| *ħ            | ∅                      | *ś                  | s      | <sup>E</sup> š |
| *s            | *s                     | *s                  | s      | s              |

Table1: Berber reflexes of Afrasian gutturals

The previous existence of a pharyngeal can also be suspected when emphatics seem to alternate with plain voiceless consonants. There exist several examples of these phonotactical emphatics:

- \*t<sup>ʕ</sup> ‘to eat’, with alternation -čč- ~ -tt-,
- \*t<sup>ħ</sup> ‘to get tired’, with alternation -d<sub>z</sub>- ~ -d-,

<sup>4</sup> A possibility that cannot be discussed here is that \*h and \*ḡ are the same proto-phoneme, and the same may be true for \*ħ and \*ḡ. There are indirect indications in Arabic that the original place of articulation of these phonemes may have been velar.

- \*h\_s\_w ‘to drink’, with alternation -s(s)- ~ -š-,

Another example of phonotactical alternation is the name of the ‘eye’ in Kabyle:

- *taṛiṛušt* ‘eye (derogatory)’ : \*ri<sup>s</sup> > riš (palatalized pharyngeal)  
 - *iṛṛəw* ‘big eye (derogatory)’ : \*r<sup>s</sup> > -ṛṛ- (phonotactical emphasis),

The reference cognate is West Chadic \*riH/\*ri<sup>s</sup> ‘oeil’. Another one is Wargli (Algeria) \*h\_d:

- *əddəs* ‘tasser la trame d'un tissage [to tamp a weaving's weft]’ (\*h\_d > dd)  
 - *əzḏ* ‘être tissé [to be weaved]’ (\*h\_d > z\_d)

Not infrequently geminated emphatics with no morphological motivation betray the previous existence of gutturals. As in some Tuareg dialects, eastern Siwa and Ghadames dialects propagate emphasis in some words: \*a‘ayḏ ‘donkey’ > \*azayḏ > \*azəyḏ. In the other branches, emphatics develop only when a consonant is in contact with a pharyngeal, for example \*t<sup>s</sup> ‘to eat’ > \*tṭ. Northern Berber does not propagate emphasis but makes the clearest distinction between the voiced and voiceless pharyngeals.

### 3. Typological examples of palatalized gutturals

The discovery of palatalized gutturals in Berber may seem unexpected. But this kind of sound change is attested in both directions in many languages. One may cite the German allophony of the phoneme /x/ realized [x] in the Singular of the word ‘night’ *nacht* [naxt] but [ç] in the Plural *nächte* [neçtə]. In Slavic, \*s inherited from Proto-Indo-European became [x] in a number of environments, in particular after \*-i-, \*-u- and \*-r- (this is known as Ruki law). Thus \*snusa ‘daughter-in-law’ is now Russian *сноха* [snoxa]. The sound changes that I propose are typologically ordinary and well attested in several languages with a clear and well-known phonetic history. Another example can be added between Hieroglyphic Egyptian and Coptic: *kh\_p\_r* ‘to create, make’ > Coptic Ⲭⲟⲡⲉ [šo:pə].

It can be hypothesized that palatalization probably started with the vowels \*/i/ and \*/u/ triggering an allophony similar to that of modern German. When in contact with \*/a/, the ancient guttural probably remained for some time. Later on this allophony got eliminated through a generalization of the palatalized allophone.

### 4. The proto-phoneme PA \*ʔ

This proto-phoneme left no explicit traces in present-day Berber dialects. Several cognates are well documented in Berber and inherited from Proto-Afrasian:

- PA \*ʔab ‘father’: Arabic ʔab, Tawellemmet, Tayərt *abba*,  
 - PA \*ʔadur ‘antilope’: Somali *aderio* ‘kudu antilope’, Touareg \*edəri ‘oryx’,  
 - PA \*ʔilam ‘skin’: Egyptian *ynm* \*[inam]<sup>5</sup> Coptic *anom* ‘skin’, Chadic \*alm/\*lamo, Berber \*ilm ‘skin’,  
 - PA \*ʔim ‘honey’: tchadique \*ʔim ‘honey’, Iznassen *tammemt* ‘honey’,  
 - PA \*ʔim ‘mother’: Hebrew \*ʔem, Kabyle *yəmma* ‘mother’.

PA \*ʔ is the only guttural that disappears in Berber as consonantal segment but this example should in no way be generalized to all gutturals.

### 5. The proto-phoneme PA \*ḥ

The two patterns and correspondences for \*s and palatalized \*ḥ can easily be compared thanks to Afrasian cognates which can be used as references:

<sup>5</sup> With nasal assimilation \*ilam > \*inam.

|                        | PA *sap<br>'river'    | PA *sin<br>'tooth' | PA *pus<br>'hand'              | PA *ḥam<br>'bitter' | PA *maḥ<br>'to rub' |
|------------------------|-----------------------|--------------------|--------------------------------|---------------------|---------------------|
| <i>Southern Berber</i> |                       |                    |                                |                     |                     |
| Tayərt                 | te-suf-t <sup>6</sup> | e-šen              | <sup>E</sup> əfəs <sup>7</sup> | <sup>E</sup> ismam  | <sup>E</sup> əməs   |
| Tahaggart              | a-suf                 | e-sīn              | a-fus                          | ismam               | əmsəl               |
| <i>Northern Berber</i> |                       |                    |                                |                     |                     |
| Kabyle                 | a-sif                 |                    | a-fus                          | ismum               | emsu                |
| <i>Eastern Berber</i>  |                       |                    |                                |                     |                     |
| Siwa                   |                       | a-sayn             | fūs                            |                     |                     |
| <i>Semitic</i>         |                       |                    |                                |                     |                     |
| Arabic                 | musfah                | sinn               | fūs                            | ḥāmiz,<br>ḥamaḍ     | maḥḥ                |

Table2: Berber reflexes of the voiceless pharyngeal \*ḥ

Reference Afrasian cognates for \*s are documented as follows:

PA \*sap 'river, valley':

- Arabic (Semitic) *musfah* 'to be full of water (a river)'
- Ankwe (West Chadic) *šip* 'river'
- Ometo (Omotic) *šafaa* 'river, lake'

PA \*pus 'hand':

- Migama (East Chadic) *pissi* 'hand, arm'
- Dangla (East Chadic) *pise* 'hand, arm'
- Bidiya (East Chadic) *pese* 'hand, arm'

In a word of that kind, /s/ is uniformly attested nearly everywhere in Berber:

- Tahaggart (Algeria) *e-sīn* 'tooth' ; *a-fus* 'hand'
- Tawellemmet (Niger) *e-šen* 'tooth' ; <sup>E</sup>*əfəs* 'hand' (with emphasis)
- Tayrt (Niger) *e-šen* 'tooth' ; <sup>E</sup>*əfəs* 'hand' (with emphasis)
- Taneslemt (Mali) *e-sen* 'tooth' ;
- Ghadames (Libya) *a-sīn* 'tooth' ; *u-fəs* 'hand'
- Nefusa (Libya) *sīn* 'tooth' ; *u-fəs* 'hand'
- Siwa (Egypt) *a-sayn* 'tooth' ; *fūs* 'hand'
- Ghat (Algeria) *i-sin* 'tooth' ; *a-fus* 'hand'
- Mzab (Algeria), Figig (Maroc) *suf* 'river'
- Zenaga (Mauritania) *ä-vuʔš* 'hand' (with intrusive /ʔ/)
- Semlal (Morocco) *a-fusi* 'hand'
- Izdeg (Morocco) *fus* 'hand'
- Tarifit (Morocco) *a-fusi* ; *fus* 'hand'
- Kabyle (Algeria) *a-fus* 'hand'

When the sibilant /s/ originates in PA \*ḥ, Southern Tuareg words have generalized emphasis. This is a peculiar and specific development of this branch of Berber. This feature typical of Niger

<sup>6</sup> Attested in toponyms.

<sup>7</sup> The unexpected emphatic is possibly caused by the back vowel \*u. But Cf. Zenaga *ävuʔš* 'hand' with an intrusive glottal stop.

Tuareg, which exhibits emphasis out of voiceless pharyngeal \*ħ > <sup>E</sup>š, permits to infer a relative chronology of sound changes in (Southern) Tuareg:

- Proto-Tuareg \*iħmam ‘bitter’ (original state with pharyngeal)
- Proto-Tuareg <sup>E</sup>iħmam (propagated emphasis)
- Proto-Tuareg <sup>E</sup>ismam (palatalized pharyngeal)
- Present-day <sup>E</sup>ismam (emphasis with no apparent cause).

With a reconstruction like \*√s\_m, it is impossible to understand why Niger Tuareg has emphatics which are absent from the rest of Berber. This generalized emphasis does not appear at random but can be determined to happen only in those words where Afrasian points at voiceless pharyngeals. The words ‘hand’ and ‘river’ with \*s do not have generalized emphasis, contrary to the words with a previous \*ħ. Data confirming the change PA \*ħ > Berber <sup>E</sup>ś are listed in the annexes. I list here the roots with a voiceless pharyngeal:

- PA \*ħ\_m ‘bitter, acid’ ~ Berber <sup>E</sup>s\_m
- PA \*ħ\_r ‘moon, star’ ~ Berber <sup>E</sup>z\_r (the emphasis is not attested)
- PA \*ħ\_r ‘sky’ ~ Berber <sup>E</sup>z\_y\_r
- PA \*ħ\_r(k) ‘arm’ ~ Berber <sup>E</sup>z\_r
- PA \*ħ\_s\_w ‘to drink’ ~ Berber <sup>E</sup>s(s)\_w (alternating with \*š)
- PA \*ħ\_s\_y ‘cold’ ~ Berber <sup>E</sup>s\_y\_r
- PA \*ħ\_w ‘red’ ~ Berber <sup>E</sup>z\_w\_q
- PA \*ħ\_y\_d ‘to weave’ ~ Berber <sup>E</sup>z\_d
- PA \*m\_ħ ‘to rub, wipe’ ~ Berber <sup>E</sup>m\_s
- PA \*p\_ħ ‘to catch, grab’ ~ Berber <sup>E</sup>b\_z
- PA \*p\_ħ ‘to chew’ ~ Berber <sup>E</sup>f\_z
- PA \*t\_ħ ‘to get tired’ ~ Berber <sup>E</sup>d\_z (alternating with \*d)

The same change is attested in a borrowing where a previous velar fricative is certain:

- Semitic \*ħ\_m\_s ‘five’ ~ Berber <sup>E</sup>s\_m\_s (ancient borrowing)

### 6. The proto-phoneme PA \*ʕ

For the voiced pharyngeal proto-phoneme, comparison between the inherited phoneme PA \*z and the palatalized reflexes is as clear as with PA \*ħ.

|                        | PA *izi<br>‘fly’ | PA *ʕay<br>‘donkey’ | PA *qaʕ<br>‘dog, wolf’ | PA *taʕ<br>‘to eat’        |
|------------------------|------------------|---------------------|------------------------|----------------------------|
| <i>Southern Berber</i> |                  |                     |                        |                            |
| Tawellemmet            | izi              | <sup>E</sup> aʒaɖ   | <sup>E</sup> a-ɣəs     | atšu ~ <sup>E</sup> itattu |
| Tahaggart              | ēhi              | eyheɖ               | a-ɣsi                  | əkš ~ tātt                 |
| <i>Northern Berber</i> |                  |                     |                        |                            |
| Kabyle                 | izi              | ižžeɖ               | a-qžun                 | yečča ~ teṭṭ               |
| <i>Eastern Berber</i>  |                  |                     |                        |                            |
| Siwa                   | izi              | izîṭ                | a-garzun <sup>8</sup>  |                            |
| <i>Semitic</i>         |                  |                     |                        |                            |
| Arabic                 | <sup>9</sup>     | ʕayr                | qāʕib                  | taʕam                      |

Table3: Berber reflexes of the voiced pharyngeal \*ʕ

<sup>8</sup> It can be noted that this word has an infix -r-.

<sup>9</sup> *Ziz* ‘cicada’ exists, but the link with \*izi ‘fly’ is not clear.

With an inherited \*z, Berber dialects show /z/.

PA \*izi ‘fly’ :

- Central Chadic \*(zi)zuway ‘fly’
- West Chadic \*(a)-zi-zuw ‘fly’
- East Cushitic \*ziz ‘bee’

Berber forms:

- Nefusa (Libya) *uzu* ‘fly’ ; *tə-zizwi* ‘bee’
- Sokna *izi* ‘fly’
- Siwa (Egypt) *izi*, pl. *izān* ‘fly’
- Ghat (Libya) *iz(z)i*, pl. *izzan* ‘fly’
- Tayrt (Niger) *izi*, pl. *izan* ‘fly’
- Tahaggart (Algeria) *ēhi* ‘fly’
- Tawllemmet (Niger) *iži*, pl. *izan* ‘fly’ (chuintante \*zi > ži)
- Zenaga (Mauritania) *iži* ‘fly’
- Semlal *izi*, pl. *izān* ‘fly’
- Izayan *izzi* ‘fly’, *tizizwit* ‘bee’
- Tarifit (Morocco) *tzizwit* ‘bee’
- Senhaja (Morocco) *tazizwit* ‘bee’
- Mzab (Algeria) *izi* ‘fly’
- Menacer (Algeria) *tizizwāt*, pl. *zizū* ‘bee’
- Wargli (Algeria) *izi* ‘fly’
- Iznassen (Morocco) *iži* ‘fly’, *dzizwi* ‘bee’
- Beni Snus (Morocco) *izi* ‘fly’, *dzizwi* ‘bee’
- Kabyle (Algeria) *izi* ‘fly’

PA \*zam ‘to be able to’:

- Logone (Central Chadic) *zəm* ‘to be able to’
- Ngizim (West Chadic) *zamu* ‘to be able to, to be possible’

Berber forms :

- Kabyle (Algeria) *ezmer* ‘to be able to’
- Wargli (Algeria) *əzmər* ‘to be able to’
- Ghadames (Libya) *ezmer* ‘to be able to’
- Tamazight (Morocco) *zmer* ‘to be able to’

In the words where \*z is inherited, no emphatics can be found and no /ž/ can be found in Northern Berber. The contrast between the correspondence *z/ž* < \*<sup>s</sup> and that of \*z is outstanding. The alternation *z/ž* has nothing to do with expressivity. The /ž/ in *a-qžun* is not expressive but the expected result of \*<sup>s</sup> in Kabyle. This is caused by historical phonology and not by expressivity. Roots with a voiced pharyngeal:

- |                                     |                           |
|-------------------------------------|---------------------------|
| - PA *bu <sup>s</sup> ‘nipple’      | ~ Berber *b_ž             |
| - PA *b_ <sup>s</sup> ‘in-law’      | ~ Berber *b_ž             |
| - PA *k_ <sup>s</sup> _n ‘dog’      | ~ Berber *k_ž_n           |
| - PA *l_ <sup>s</sup> ‘claw, nail’  | ~ Berber *l_ž             |
| - PA *m_ <sup>s</sup> ‘to hear’     | ~ Berber *m_ž             |
| - PA *m_ <sup>s</sup> ‘lion, cat’   | ~ Berber *muši            |
| - PA *n_ <sup>s</sup> ‘toe, finger’ | ~ Berber *n_s (irregular) |
| - PA * <sup>s</sup> _k ‘shin, hoof’ | ~ Berber *ž_k_(r/b)       |



- PA \*<sup>ς</sup>m\_r ‘lamb’ ~ Berber \*z\_m\_r (irregular)
- PA <sup>ς</sup>y\_(r) ‘donkey’ ~ Berber \*<sup>ς</sup>zid (with another suffix)
- PA \*p\_<sup>ς</sup> ‘to fall’ ~ Berber \*b\_<sup>ς</sup>
- PA \*r\_<sup>ς</sup> ‘to break’ ~ Berber \*r\_z
- PA \*s\_<sup>ς</sup>\_r ‘hair’ ~ Berber \*z<sup>ς</sup>\_r
- PA \*t\_<sup>ς</sup> ‘to eat’ ~ Berber \*t<sup>ς</sup> (alternating with \*t)

7. The proto-phoneme PA \*h

From the Berber point of view this proto-phoneme is not easily distinguished from \*z. Examples are rare as PA \*h seems to be much less frequent than the other gutturals. The table of internal correspondences is as follows:

|                        | Voiced<br>Laryngeal /h/ | *habar<br>‘big, large’ |
|------------------------|-------------------------|------------------------|
| <i>Southern Berber</i> |                         |                        |
| Tayrt                  | z                       | izwar                  |
| Tawellemmet            | z                       | izwar                  |
| Tahaggart              | h                       | huher                  |
| Zenaga                 | z                       | zowər                  |
| <i>Eastern Berber</i>  |                         |                        |
| Siwa                   | z                       | a-zwār                 |
| Ghadames               | z                       | zwər                   |
| <i>Northern Berber</i> |                         |                        |
| Kabyle                 | z                       | zūr                    |
| Chawi                  | z                       | zzur                   |
| Tamaziyt               | z                       | zur                    |
| Tachelhit              | z                       | zur                    |
| <i>Semitic</i>         |                         |                        |
| Arabic                 | h                       | habar                  |

Table4: Berber reflexes of Afrasian voiced laryngeal \*h

Roots with a voiced laryngeal:

- PA \*h\_r ‘day’ ~ Berber \*z\_l
- PA \*h\_w ‘wind’ ~ Berber \*z\_w
- PA \*h\_b\_r ‘big, large’ ~ Berber \*z\_b\_(r)
- PA \*b\_h ‘sex’ ~ Berber \*b\_z

It is possible that the phoneme \*h of Tahaggart may be an archaism rather than an innovation, as the cycle PA \*h > Proto-Berber \*z > Tahaggart \*h seems a bit artificial.

8. The Afrasian vocabulary involving gutturals

Gutturals are frequent and fundamental phonemes of Proto-Afrasian. The examples of guttural palatalization quite logically involve the basic vocabulary of Berber. The following words are attested: *big, bitter, to break, cat, to catch, to chew, claw, cold, day, dog, donkey, to drink, to eat, eye, to fall, to get tired, hair, to hear, moon, nail, nipple, red, to rub, sex, sky, star, to tie, to weave, wind.* The

traditional hypothesis of the muting out of gutturals in Berber is not just wrong. It fails to identify as inherited and Afrasian many words of Berber dialects.

Moreover it is possible to distinguish between heritage and diffusion. Northern Berber has /ž/ as regular reflex of the voiced pharyngeal \*/s/. Among regular examples:

- PA \*k<sub>1</sub>n ‘dog’ ~ Northern Berber \*q<sub>1</sub>ž<sub>1</sub>n
- PA \*t<sub>1</sub> ‘to eat’ ~ Northern Berber \*tš (alternating with \*tṭ)
- PA \*bu<sub>1</sub> ‘nipple’ ~ Northern Berber \*buš

There also exist irregular items:

- PA \*m<sub>1</sub>r ‘lamb’ ~ Northern Berber \*z<sub>1</sub>m<sub>1</sub>r
- PA \*n<sub>1</sub> ‘toe, finger, hoof’ ~ Northern Berber \*n<sub>1</sub>z

The irregular items seem to involve words of neolithic diffusion in relationship with breeding.

### 9. Morphological features of Proto-Berber dating

Several verbs have interesting irregularities which can be understood only in reference with a stage older than the palatalization of gutturals. For example the verb ‘to eat’ has a radical allomorphy between -čč- and -tṭ-. The Afrasian cognate \*√t<sub>1</sub> offers the key to the understanding of the Proto-Berber situation:

- the vocalized radical \*ta<sub>1</sub> became \*təž > \*čč with mutual assimilation,
- the non vocalized radical \*-t<sub>1</sub>- (Intensive) became the emphatic \*tṭ.

As is often the case, synchronic irregularities are solved and explained by phonetic changes that occurred and disrupted a regular paradigm. This verb permits to determine which Berber verbal forms had a vowel in the radical scheme (Aorist) and which did not (Intensive). A potential reconstruction on that basis would be:

|                     | Proto-Berber                        | Tawellemmet | Kabyle           |
|---------------------|-------------------------------------|-------------|------------------|
| Plain Imperfect     | *á-ta <sub>1</sub> -u <sup>10</sup> | atšu        | ye-čč            |
| Plain Perfect       | *í-ta <sub>1</sub> -a <sup>11</sup> | itša        | ye-čča           |
| Intensive Imperfect | *i-tá-t <sub>1</sub> -u             | i-taṭṭ-u    | i-tetṭ           |
| Intensive Perfect   | *i-tá-t <sub>1</sub> -a             | i-taṭṭ-a    | (does not exist) |

Table5: Reconstructed Berber verbal paradigm for ‘to eat’

In the Intensive the radical was not vocalized, which causes an emphatic to appear. The verb ‘to drink’ behaves in a similar way. It displays unusual alternations between simple consonants and emphatics. Afrasian data show that the radical of this verb was \*√s<sub>1</sub>w with incremental \*h (voiceless pharyngeal) sometimes as a prefix as in Arabic sometimes as a suffix as in Chadic. Berber data are coherent with a prefixal \*h-. This is mentioned in Orel & Stolbova (1995:286): “hV- may be a prefix.” According to Tuareg the increment only exist in the Imperfect.

<sup>10</sup> This can be compared with Arabic *ya-falu*.

<sup>11</sup> This can be compared with Arabic *fa<sup>o</sup>ala*.

Analogy has somewhat blurred the original situation:

|                     | Proto-Berber | Tayrt   | Kabyle           |
|---------------------|--------------|---|------------------|
| Plain Imperfect     | *á-ḥasw-u    | ašu ( <sup>E</sup> assu) <sup>12</sup>          | isew             |
| Plain Perfect       | *í-sw-a      | yəša (yəswa)                                    | yeswa            |
| Intensive Imperfect | *i-táḥsw-u   | <sup>E</sup> yəšašsu<br>( <sup>E</sup> yətassu) | i-tess           |
| Intensive Perfect   | *i-tá-sw-a   | <sup>E</sup> yəšašša<br>( <sup>E</sup> yətaswa) | (does not exist) |

Table6: Reconstructed Berber verbal paradigm for ‘to drink’

The verb ‘to drink’, obviously a basic and frequent verb, has been influenced by the other verb ‘to eat’, all the more so as they are phonetically close in Berber. The form of Plain Imperfect \*á-ḥasw-u is attested in Tačawit *šū* with emphatic and in Moroccan Berber *ssu* with geminate. Emphasis in Tačawit cannot be explained without the presence of the increment. Tuareg does not have emphasis exceptionally because the forms are remade after the verb ‘to eat’ which does not have emphasis. If Tuareg had kept the expected forms the verb ‘to drink’ would be even more irregular.

Another formation is interesting: expressive derivatives of adjectives. For example in Figig: *amellal* ‘white’ > *šamlal* ‘whitish’, *adal* ‘green’ > *šadal* ‘greenish’, *awray* ‘yellow’ > *šawray* ‘yellowish’. My conclusion would be that /š/ comes from pharyngeal \*ʕ. It is interesting to read Kossmann (1999:12): “Dans la plupart des formations expressives, il s’agit d’autres consonnes qui sont ajoutées : surtout š et ž, et les consonnes empruntées h, ʕ, ħ et q.”<sup>13</sup> It is intriguing to note that š et ž are the same as \*ʕ in my approach. This formation amounts to the prefixation of Proto-Berber \*ʕ- (> š and ž) to the adjective. There is one exception to this formation: *ažekkʷay* ‘red’ > *lazway* ‘reddish’ with a different consonant. My suggestion is to analyse: *ažekkʷay* as \*aḥeway<sup>14</sup>, \*/l/ was preferred to /ʕ/ in *lazway* because Proto-Berber \*ʕaḥway would have had too many fricative gutturals.

## 10. Conclusion

Proto-Berber used to have a full set of gutturals inherited from Afrasian: laryngeals \*ʔ and \*h, pharyngeal \*ħ and ʕ. Contrary to the traditional point of view which holds these phonemes to have disappeared in present-day Berber, they are attested as sibilants. More words are actually inherited from Proto-Afrasian than is usually assessed. In addition, these correspondences and sound developments explain a number of morphological oddities in a number of verbs, in particular ‘to eat’ and ‘to drink’.

<sup>12</sup> In brackets the expected forms.

<sup>13</sup> “In most expressive formations [of Berber], other consonants are added: mostly š and ž, and the borrowed phonemes h, ʕ, ħ et q.”

<sup>14</sup> Omotic (Male, Oyda, Bencho) is \*zawḵ ‘red’ but if this comparison is accepted then Berber preference for \*l- remains unexplained.

ANNEX: LEXICAL DATA

Berber lexical data are drawn from the works listed in the references. Glosses in French taken from Berber dictionaries in French are not translated unless they differ from the expected standard meaning. Glosses for Arabic are drawn from Kazimirski's dictionary.

*Examples with a voiceless pharyngeal*

Amer, aigre, oseille [bitter, acid, sorrel]  $^*\sqrt{h}_m$  Cf. Bomhard (2008:Vol.2 656) n°622. Proto-Nostratic  $^*ham$  '(to be) sharp, sour, acid'. This root is listed in Orel & Stolbova (1995:134) as  $^*t\check{s}a(H)am$  and (1995:285)  $^*hVmat\check{s}$ . None of these works seem to perceive the relationship between these forms.

1. Semitic forms: Arabic *ḥamaz* 'piquer (la langue, se dit d'une saveur acide), *ḥāmiz* 'piquant, âcre', *ḥamaḍ* 'être acide, aigre', *ḥummāḍ*, *ḥamīḍ* 'oseille'; Akkadian *emē* 'aigre' (without increment), Hebrew *ḥamis*. The root is  $^*\sqrt{h}_m$  either bare or incremented with *z* or *ḍ*.

2. The Egyptian word for 'vinegar' *ḥmḍ*, may be a Semitic borrowing.

3. Berber forms:

- Ghadames (Libya) *semmumen* 'aigre'
- Tayrt (Niger)  $^E$ ismam 'aigre, âcre'
- Tawellemmet (Niger)  $^E$ ismam 'aigre, âcre'
- Tahaggart (Algeria) *ismam* 'amer' (without emphasis)
- Kabyle (Algeria) *ismum* 'aigre, acide'
- Kabyle (Algeria) *asemmam* 'oseille'
- Wargli (Algeria) *əsməm* 'aigre'
- Tachelhit (Morocco) *ismum* 'aigre, acide'

Frotter, essayer [to rub, to wipe]  $^*\sqrt{m}_h$  Not in Orel & Stolbova (1995). A root with the same phonemes as  $^*\sqrt{h}_m$  in the opposite order.

1. Semitic forms: Arabic *maḥḥ* 'être usé, râpé', *maḥas* 'nettoyer, polir (une lance)', *maḥaq*, *maḥâ* 'effacer et supprimer les traces', Arabe *masaḥ*, *maḥaj* 'essuyer quelque chose en passant la main dessus', *maših* 'avoir l'intérieur des cuisses froissés par le frottement d'un vêtement'.

2. Berber forms:

- Tayrt (Niger)  $^E$ əməs 'essuyer, effacer'
- Tayrt (Niger)  $^E$ ta-səməs-t 'plaie produite par frottement (aux cuisses des chameaux)'
- Tayrt (Niger)  $^E$ əmsəl 'frotter, frôler légèrement'
- Tahaggart (Algeria) *əmsəl* 'frotter légèrement'
- Tawellemmet (Niger)  $^E$ əməs 'essuyer, effacer'
- Tawellemmet (Niger)  $^E$ ta-səməs-t 'plaie produite par frottement'
- Tawellemmet (Niger)  $^E$ əmsəl 'frotter, frôler légèrement'
- Kabyle (Algeria) *emsu* 'être effacé ; être insipide [to be tasteless]'
- Wargli (Algeria) *əmmis* 'être égalisé, lissé [to be leveled, even]'; *aməs* 'frotter, essayer fort'

Clarté de la lune, des étoiles [moonlight, starlight]  $^*\sqrt{h}_r$  Cf. Orel & Stolbova (1995:279).

1. Afrasian forms: Mehri (South Semitic) *ḥarīt* 'lune', Harsusi (South Semitic) *ḥarēt* 'lune', Arbore (Cushitic) *hir* 'clarté des étoiles ou de la lune', Tumak (East Chadic) *ḥēru* 'étoile'.

2. Berber forms:

- Kabyle (Algeria) *tiziri* 'clair de lune'

- Wargli (Algeria) taziri ‘lune’
- Tamazight (Morocco) tiziri ‘clair de lune’
- Ghadames (Libya) taziri ‘lune’ (Cf. iri ‘étoile’)
- Zenaga (Mauritania) ežžir ‘lune’

Ciel [sky] \*√h\_r Cf. Orel & Stolbova (1995:275).

1. Afrasian forms: Egyptian *ḥr.t* ‘ciel’, Sha (West Chadic) *arè* ‘ciel’.

2. Berber forms:

- Tahaggart (Algeria) azyar ‘ciel, voûte céleste’
- Tawellemmet (Niger) <sup>E</sup>azyar ‘ciel, voûte céleste’
- Tayrt (Niger) <sup>E</sup>azyar ‘ciel, voûte céleste’

Froid [cold] \*√h\_s Cf. Orel & Stolbova (1995:282).

1. Afrasian forms: Egyptian *ḥsi* ‘froid’, Gaanda (Central Chadic) *həs* ‘froid’, Jegu (East Chadic) *ʔés* ‘vent froid’

2. Berber forms:

- Tayrt (Niger) taššay ‘froid extrême’ (without emphasis)
- Tahaggart (Algeria) tīsas ‘frissons [shuddering]’
- Kabyle (Algeria) ffuššel ‘avoir l’onglée, les mains gelées, paralysées par le froid [to be frozen, numb with cold (hands)]’ (increment p)
- Chawi (Algeria) fšel ‘avoir les doigts raidis par le froid, être gourde [numb with cold]’

It should be noted that Berber is more coherent with \*<sub>s</sub> than \*h<sub>s</sub>.

Bras, épaule [arm, shoulder] \*√h\_r Cf. Orel & Stolbova (1995:275).

1. Afrasian forms: Arabic (Semitic) *ḥārak* ‘garrot, haut du dos entre les épaules’, Saho (Cushitic) *haraa* ‘bras’, Mbugu (Cushitic) *iharega* ‘bras’, Mofu (Chadic) *har* ‘bras’, Beja (Omotique ?) *harka* ‘bras’, Oromo (omotic) *harkka* ‘bras’

2. Berber forms:

- Tahaggart (Algeria) azir ‘épaule’
- Tawellemmet (Niger) <sup>E</sup>azir ‘épaule’
- Tayrt (Niger) <sup>E</sup>əžir ‘épaule’
- Tadaght (Mali) æ-zérh ‘épaule,’

The relationship Zenaga *ōʔri* ‘épaule’ is unclear.

Boire [to drink] \*√(h\_)s\_w Cf. Orel & Stolbova (1995:286).

1. Afrasian forms: Arabic (Semitic) *ḥasā* ‘boire, absorber par petites gorgées’, Hausa (West Chadic) *ša* ‘boire’, Mupun (West Chadic) *siwah* ‘boire’ (suffixal increment).

2. Berber forms:

- Ghadames (Libya) əswu ‘boire’
- Nefusa (Libya) su ‘boire’
- Siwa (Egypt) su ‘boire’
- Kabyle (Algeria) əsəw ‘boire’ ; itess
- Chawi (Algeria) šû (with emphatic)

- Wargli (Algeria) səw ‘boire’ ; Intensive yətəss (Ingusa variant yəssess<sup>15</sup>)
- Tarifit (Morocco) su (Present isas Past yaswa)
- Iznassen (Morocco) əssû (with gemination)
- Ghat (Algeria) əsu
- Tahaggart (Algeria) əsu ‘boire’ ; Intensive sâss ; tesese ‘façon de boire’
- Tawellemmet (Niger) ašwu ‘boire’ ; <sup>E</sup>tess ‘boisson’ ; <sup>E</sup>isassu ‘bois’
- Tayrt (Niger) ašū ‘boire’ ; <sup>E</sup>yəsassu ‘boire beaucoup’ ; <sup>E</sup>tesse/<sup>E</sup>tisəssa ‘boisson’
- Taneslemt (Mali) isu ‘boire’
- Zenaga (Mauritania) ešbi ‘boire’

Rouge [red] \*√h\_w-

1. Berber forms:

- Semlal (Morocco) i-zwiγ ‘rouge’
- Izdeg (Morocco) a-zuggway ‘rouge’
- Kabyle (Algeria) a-zəggway ‘rouge’
- Tamazight (Morocco) a-zəggway ‘rouge’
- Chawi (Algeria) a-zuggay ‘rouge’
- Wargli (Algeria) azəggay ‘rouge’
- Figig (Morocco) a-zəkkay ‘rouge’ (with emphasis)
- Ghadames (Libya) a-zəggay ‘rouge’
- Siwa (Egypte) a-zəggəγ ‘rouge’
- Tayrt (Niger) <sup>E</sup>i-zway ‘rouge’
- Tahaggart (Algeria) ihway ‘rouge’ ; ezəggəγ ‘rouge foncé’ ; zəggar ‘rubéole [German measles]’ ; haggay ‘rougeole [measles]’
- Zenaga (Mauritania) žobba ‘rouge’

Tisser, nouer, coudre [to weave, to tie, sew] \*√h\_y\_d

1. Afrasian forms: Arabic (Semitic) *ḥayad* ‘nouer, faire des nœuds’, Ndam (East Chadic) *yîdâ* ‘nouer’, Beja (unclassified) *haayida* ‘coudre’,

2. Berber forms:

- Tahaggart (Algeria) əss ‘tisser’ ; əzz ‘être tissé’ ; əzmi ‘coudre’
- Tawellemmet (Niger) <sup>E</sup>azdu ‘tisser, tresser’
- Tayrt (Niger) <sup>E</sup>azdu ‘tisser, tresser’
- Wargli (Algeria) əddəs ‘tasser la trame d’un tissage’ (emphasis \*h\_d > dd)
- Wargli (Algeria) əzd ‘être tissé’

Another word is \*√h\_w\_ʔ ‘to sew’, well attested in Afrasian.

Broyer, mâcher [to grind, to chew] \*√p\_h

1. Afrasian forms: Akkadian *pēnu* ‘broyer’, Arabic *fahas* ‘broyer, frotter dans la main un épi et enlever le grain’, Chadic \*paHin ‘casser, broyer, aiguïser’,

2. Berber forms:

- Wargli (Algeria) əffəz ‘mâcher, broyer’
- Tahaggart (Algeria) əffez
- Tawellemmet, Tayrt (Algeria) <sup>E</sup>əffez ‘mâcher’

<sup>15</sup> This form is reminiscent of Niger Tuareg.

- Tawellemmet, Tayrt (Algeria) <sup>E</sup>fazfaz ‘broyer’
- Kabyle əffəz ‘mâcher’ (never means ‘to grind’)

Attraper [to catch, seize] \*√(ts-)p\_h

1. Afrasian forms: Egyptian *spḥ* ‘attraper avec un lasso’, Hausa (West Chadic) *čáfè* ‘attraper’, Bidiya (East Chadic) *čaap* ‘prendre’,

2. Berber forms:

- Tahaggart (Algeria) abəz ‘saisir dans la main’
- Tawellemmet (Niger) <sup>E</sup>əbəz ‘attraper, saisir’
- Tayrt (Niger) <sup>E</sup>əbəz ‘attraper, saisir’

Another root is \*t\_?\_p ‘saisir [to seize]’ with two different phonotactical emphatics:

- Wargli (Algeria) əttəf ‘saisir, prendre’ (< t<sup>?</sup>\_p)
- Tahaggart (Algeria) əttəf ‘saisir, prendre’
- Kabyle (Algeria) əttəf ‘tatonner’
- Chadic \*taḅ ‘saisir’ (< t\_?\_p)

Fatigue [to get tired] \*t\_h Cf. Orel & Stolbova (1995:496).

1. Afrasian forms: Arabic *taʿib* ‘être las, fatigué’, Mubi \*táʾábá ‘se fatiguer’,

2. Berber forms:

- Kabyle (Algeria) s-ɖuɖeʰ ‘être épuisé, à bout de force’ (derivative without primitive verb)
- Tahaggart (Algeria) zuɖəh/əɖgez ‘fatiguer’ ; əɖdeh ‘se fatiguer’ ; uɖūh ‘fatigue’
- Tawellemmet (Niger) <sup>E</sup>əddəz ‘se fatiguer’
- Tayrt (Niger) <sup>E</sup>əddəz ‘se fatiguer’<sup>16</sup>

The pharyngeal must have been originally voiceless, and Arabaic must have undergone a change.

*Example(s) with a voiceless velar fricative*

Cinq [five] \*√h\_m\_s

1. Afrasian forms: Semitic \*ḥamīs ‘cinq’

2. Berber forms: (an ancient borrowing)

- Tawellemmet (Niger) <sup>E</sup>səmmos ‘cinq’ (with emphasis)
- Tayrt (Niger) <sup>E</sup>səmmos ‘cinq’ (with emphasis)
- Tahaggart (Algeria) səmmus ‘cinq’ (with emphasis)
- Ghadames (Libya) səmməs
- Tachelhit (Morocco) smmus
- Wargli (Algeria) səmməs
- Zenaga (Mauritania) šammuš ‘cinq’

A loanword old enough to have become palatalized.

<sup>16</sup> Cf. Tayrt (Niger) əltəz ‘se fatiguer’ without emphasis.

Examples with a voiced pharyngeal

Sein [nipple] \*√bu

1. Afrasian forms: Semitic ʿu(m)b ‘sein’ (prefixal \*ʿ), Somali (Omoti) ʿib ‘sein’ (prefix), Central Chadic \*bu(bu)<sup>17</sup> ‘sein’, Est Chadic \*buwa ‘sein, lait’

2. Berber forms:

- Ghat (Algeria) a-bbui ‘sein’ (bare root)
- Kabyle (Algeria) bubbu (bare root), tabbušt, tibbušin ‘sein’ (< \*buʿ suffix)

Cousin par alliance [cousin-in-law] \*√baʿ Cf. Orel & Stolbova (1995:46).

1. Afrasian forms: Arabic (Semitic) *baʿl* ‘époux, maître, mari ou femme [spouse]’, Semitic \*baʿal ‘se marier [to get married]’, Saho, Afar (cushitic) *ballaa* ‘beau-père [father-in-law]’, Qwadza (Cushitic) *ayi-balaʿo* ‘cousin croisé [cousin]’

2. Berber forms:

- Tawellemmet (Niger) abobaz ‘cousin croisé’
- Tahaggart (Algeria) bubeh ‘être cousin germain’
- Tadaght (Mali) æbábaš ‘cousin croisé’
- Ghat (Algeria) ababah ‘cousin (autre que germain)’

The relationship with the following words is unclear:

- Nefusa (Libya) bušil ‘garçon [son]’ ; tebušilt ‘fille [daughter]’,
- Wargli (Algeria) tabza ‘marmaille, enfant [child]’.

Chien [dog] \*√kw\_h\_n or \*√q\_ʿ\_n Cf. Orel & Stolbova (1995:329).

1. Afrasian data: Yaaku (Cushitic) *kwehen*, Dime (Omoti) *keenu*, Diddesa (omoti) *kanu*, Migama (Chadic) *kânnyà*, Jegu (Chadic) *kany*, Dangla (Chadic) *kànyà*, Fyer (Chadic) *kwéeng*.

2. Berber forms:

- Iznasen (Morocco) aqzin ‘chiot [puppy]’ (irregular z)
- Kabyle (Algeria) a-qžun ‘chien’ (used as insult)
- Siwa (Egypte) a-garzun ‘chien’ (with infixal -r-)
- Tayrt (Niger) <sup>E</sup>a-γši, ta-γši-t ‘lycaon, chien-loup’
- Tahaggart (Algeria): a-γsi ‘loup [wolf]’
- Tawellemmet (Niger): <sup>E</sup>a-γəs, <sup>E</sup>ši-γəs-t<sup>18</sup> ‘lycaon, chien-loup’

Berber supposes \*q\_ʿ\_n with a voiced pharyngeal but Orel & Stolbova (1995:329) reconstructs a voiceless pharyngeal \*kw\_h\_n. Other forms with a pharyngeal are probably from Arabic *qaʿib* ‘howling wolf’ < *qāʿ* ‘to howl’:

- Tamaziyt (Morocco) ikeʿb ‘renard [fox]’
- Tarifit (Morocco) akʿab ‘renard’
- Beni Snus (Morocco) ašʿab ‘renard’
- Figig (Morocco) ikʿeb ‘renard’

<sup>17</sup> /b/ supposes phonotaxis with \*ʿ or \*ʔ.

<sup>18</sup> Initial #ši- < \*ti-.



- Mzab (Algeria) ič<sup>s</sup>eb ‘renard’
- Beni Menacer (Algeria) ik<sup>s</sup>ab ‘renard’
- Metmata (Algeria) ik<sup>s</sup>ab ‘renard’
- Tachelhit (Morocco) aba<sup>s</sup>kka, aba<sup>s</sup>kku ‘renard’

Griffe, ongle [claw, nail] \*√la<sup>s</sup> Cf. Orel & Stolbova (1995:362).

1. Afrasian forms: Banana (Chadic) lilifa ‘ongle’, Beja (unclassified) ne'aff ‘griffe’ (with suffixal -p-), Saho (Cushitic) lifi<sup>s</sup> ‘griffe, ongle’ (with infixal -p-)

2. Berber forms:

- Tawellemmet (Niger) <sup>E</sup>eləz ‘griffe (de lion ou de rapace)’ (with no -p-)
- Tayrt (Niger) <sup>E</sup>elaz ‘griffe (de lion ou de rapace)’ (with no -p-)

Entendre [to hear] \*√ma<sup>s</sup>

1. Afrasian forms: Arabci (Semitic) sama<sup>s</sup> ‘entendre’, Hebrew (Semitic) sâme<sup>s</sup> ‘entendre’,

2. Berber forms:

- Kabyle (Algeria) s-muz-get ‘écouter attentivement’
- Kabyle (Algeria) amezzuγ ‘oreille [ear]’ (< m\_<sup>s</sup>\_s\_q)
- Wargli (Algeria) taməžžit ‘oreille [ear]’ ; məzyuf ‘mal d'oreille [ear ache]’
- Tahaggart (Algeria) taməzzuk ‘oreille [ear]’ ; imzay ‘sourd [deaf]’
- Tawellemmet (Niger) <sup>E</sup>tamməzzuk ‘oreille [ear]’
- Tayrt (Niger) <sup>E</sup>mazag ‘sourd [deaf]’
- Zenaga (Mauritania) tamazgud ‘oreille [ear]’

Lion, chat [lion, cat] \*m\_<sup>s</sup> Cf. Orel & Stolbova (1995:391).

1. Afrasian forms: Egyptian *my*, *m3* ‘lion’, Coptic *moui* ‘lion’, Somrai, Tokoro, Tumak, Ndam (East Chadic) \*mui ‘lion’

2. Berber forms:

- Tahaggart (Algeria) mušš ‘chat’
- Kabyle (Algeria) amšiš/muš ‘chat’
- Wargli (Algeria) mušš ‘chat’

Orteil, doigt [toe, finger] \*√na<sup>s</sup>

1. Afrasian forms: Arabic (Semitic) na<sup>l</sup> ‘sabot (du cheval) [horse hoof]’, Khamta (Cushitic) *naan* ‘main [hand]’, Qwara (Cushitic) *naan* ‘main, doigt’, Egyptian *n.t* ‘ongle’ (with metathesis)

2. Berber forms: (probably a wanderwort)

- Kabyle (Algeria) tinsa (pluriel) ‘sabot des bovidés [hoof of cattle]’ (irregular)
- Wargli (Algeria) tinsi ‘pied et bas de la patte des quadrupèdes domestiques [paw of cattle]’
- Tahaggart (Algeria) tinse ‘orteil’
- Tawellemmet (Niger) šinše ‘orteil’
- Tayrt (Niger) tyanše ‘orteil’

Le mot kabyle sans chuintante est probablement un emprunt à un autre dialecte Berber.

- Kabyle (Algeria) tifenzett ‘sabot (caprins, ovins, bovins) [hoof (goat, sheep, cattle)]’ (irregular)
- Tachelhit (Morocco) afnzu ‘sabot ; pied ; ongle’ (irregular)
- Tamaziɣt ifenzi ‘pointe du pied (ensemble des orteils)’ (irregular)
- Ntifa (Morocco) ifenzi ‘sabot des ovins [sheep hoof]’
- Taɣawit (Algeria) tifenzet ‘corne du pied’ (irregular)
- Beni Snus (Morocco) tifenzit ‘sabot des ruminants [cattle hoof]’ (irregular)
- Mzab (Algeria) tifenzit ‘sabot des ruminants ; ongle de caprins’
- Wargli (Algeria) tafenzit ‘sabot, ongle de capridés, d’ovin, de bovin ; sole de chameau’

Many forms are irregular and this indicates a wanderwort.

Porter sur le dos [to carry on the back] \*<sup>s</sup>\_b and (reduplicated) bubbeḅ

1. Berber forms:

- Tahaggart (Algeria) bubbu ‘porter sur le dos’
- Tadaght (Mali) bubbu ‘porter sur le dos’
- Taneslemt (Mali) bubbeh ‘porter sur le dos’
- Tawellemmet (Algeria) babbu ‘porter sur le dos’
- Zenaga (Mauritania) eḅbemi ‘porter sur le dos’
- Taɣawit (Algeria) ‘ebba ‘porter sur le dos’ (without palatalisation)
- Kabyle (Algeria) bibb ‘porter sur le dos’
- Tamaziɣt (Morocco) bubba/babb ‘porter sur le dos’
- Figig (Morocco) ppab ‘porter sur le dos’
- Chenoua (Algeria) abba ‘porter sur le dos’
- Metmata (Algeria) bba ‘porter un enfant sur le dos’

Possibly related:

- Siwa (Egypt) obb/ubb ‘amener [to bring]’
- Ghadamès (Libya) abb (intensif ttababb) ‘transporter, porter [to transport, carry]’
- Wargli (Algeria) əbbi ‘prendre, emporter [to take away]’

Agneau [lamb] \*<sup>s</sup>amar

1. Afrasian forms: Arabic (Semitic) ya<sup>s</sup>mūr ‘chevreau, petit agneau’, Arabic (Semitic) ‘umrūs ‘agneau’

2. Berber forms: (probably a wanderwort)

- Tamazight (Morocco) izimer ‘agneau’
- Kabyle (Algeria) izamaren ‘agneau’
- Taɣawit (Algeria) izmər ‘agneau’
- Beni Snus (Morocco) izmər ‘agneau’
- Tawellemmet (Niger) aḅemar ‘agneau’
- Tayrt (Niger) əḅemər ‘agneau’
- Zenaga (Mauritania) eḅimər ‘agneau’

Phonetic correspondences are not regular. Several wanderworts are attested: Cf. Arabic *ḥamal*, *ḥamak* ‘agneau [lamb]’, Cf. \*<sup>s</sup>immar ‘agneau [lamb]’. The word ‘bélier [ram]’ may be another one:

- Kabyle (Algeria) izimer ‘bélier [ram]’
- Semlal (Morocco) izimər ‘bélier’
- Ghadames (Libya) azumar ‘bélier’ (with emphasis)

- Izayan izmər ‘béliér’
- Siwa (Egypt) zmər ‘béliér’
- Tdaght (Mali) ežémər ‘jeune béliér (sevré)’

Tomber [to fall] \*√pa<sup>ʕ</sup> Cf. Orel & Stolbova (1995:414).

1. Afrasian forms: Hausa (West Chadic) paadi ‘tomber’ (< \*pa<sup>ʕ</sup>-t- ?)

2. Berber forms:

- Tawellemmet (Niger) bazbaz ‘tomber’
- Tayrt (Niger) bazbaz ‘tomber’
- Tahaggart (Algeria) bərəzzət ‘tomber lourdement’ (increment -r-)

Ane [donkey] \*a<sup>ʕ</sup>ayt Cf. Orel & Stolbova (1995:243).

1. Afrasian forms: Arabic (Semitic) ‘ayr ‘âne’

2. Berber forms:

- Ghadames (Libya) azêd ‘âne’
- Augila (Libya) azit, azit ‘âne’
- Tahaggart (Algeria) əyhəð ‘âne’ (and ahûlil ‘âne sauvage [wild donkey]’)
- Tawellemmet (Niger) <sup>E</sup>ažad ‘âne’
- Ghat (Libya) ižžid ‘âne’
- Kabyle (Algeria) ižžed ‘ânon’
- Nefusa (Libya) aziaṭ ‘âne’
- Siwa (Egypt) izit ‘âne’

Cf. Wargli (Algeria) ɬa<sup>ʕ</sup>ɬa<sup>ʕ</sup> ‘âne (langage enfantin)’

Guérir [to recover] \*√y<sup>ʕ</sup>\_(k)

1. Berber forms:

- Ghadames (Libya) əzik ‘guérir’
- Augila (Libya) zik ‘guérir’
- Tahaggart (Algeria) əzzi ‘guérir’ ; zuzi ‘guérir qn’
- Tawellemmet (Niger) əzzəy ‘être guéri’
- Tayrt (Niger) əžžəy ‘être guéri’
- Tdaght (Mali) z-zy ‘guérir’
- Ghat (Libya) ežži ‘guérir’
- Kabyle (Algeria) žži ‘être guéri’
- Tachelhit (Morocco) žži ‘être guéri’
- Tamaziɣt (Morocco) žžey ‘être guéri’
- Senhaja (Morocco) ži ‘guérir’
- Figig (Morocco) žžey ‘guérir’
- Zenaga (Mauritania) ežžig ‘être guéri’

Oncle, griffe, sabot [nail, claw, hoof]\*√k<sup>ʕ</sup>\_b

1. Afrasian forms: West Chadic \*kaway ‘ongle’ < \*√k<sup>ʕ</sup>\_b (with phonotaxis)

2. Berber forms:

- Tahaggart (Algeria) iskər ‘ongle, sabot’ < \*<sup>s</sup>\_k\_r
- Kabyle (Algeria) ašekkaben ‘bas de la patte’ < \*<sup>s</sup>\_k\_b
- Tachelhit (Morocco) ifnškr / afnškuḍ ‘sabot des bovidés’ < \*<sup>s</sup>\_k\_r
- Tachelhit (Morocco) a-baškar ‘griffe d'un lion, d'un fauve’ (increment b-)
- Tachelhit (Morocco) tafškr ‘griffe, orteil, sabot de mouton’ (increment p-)
- Kabyle (Algeria) iššər ‘griffe, ongle’ (irregular loss of \*k)
- Wargli (Algeria) aššar ‘ongle, sabot d'animal, serre’

This word is more regular than \*na<sup>s</sup> ‘orteil, sabot [nail, hoof]’.

Casser [to break] \*<sup>s</sup>√r\_ Cf. Orel & Stolbova (1995:449).

1. Afrasian forms: PA \*r\_<sup>s</sup> ‘casser’, Hebrew \*r\_<sup>s</sup> ‘casser’, Munjuk (Central Chadic) *riwi* ‘casser’

2. Berber forms with suffix \*-s-:

- Wargli (Algeria) əṛṛəz ‘être cassé [to be broken]’ < r\_<sup>s</sup> with phonotaxis
- Tahaggart (Algeria) ərz
- Kabyle (Algeria) əṛṛəz ‘être cassé [to be broken]’

Kabyle \*z cannot be from \*<sup>s</sup> directly.

Poil [hair] \*s\_<sup>s</sup>\_r

1. Afrasian forms: Semitic \*ša<sup>r</sup> ‘poil, cheveux’, Dizi (omotic) *saaru* ‘poil’

2. Berber forms:

- Semlal (Morocco) a-zzär ‘poil’
- Seghrouchen (Morocco) a-zzar ‘poil’
- Izdeg (Morocco) a-zzar ‘poil’
- Tahaggart (Algeria) azzər<sup>19</sup> ‘poil (d'un animal mort)’

The initial geminate is from \*s\_ž > -zz-.

Manger [to eat] \*<sup>s</sup>√ta<sup>s</sup> Cf. Orel & Stolbova (1995:493).

1. Afrasian forms: Semitic \*ta<sup>s</sup>am ‘goûter [to taste]’, Hausa (West Chadic) *či* ‘manger’, Banana (Central Chadic) *tamu* ‘manger’, Bidiya (East Chadic) *taa* ‘manger’

2. Berber forms:

- Tayrt (Niger) ətṭyu ~ <sup>E</sup>itattu ‘manger’ ; <sup>E</sup>tette ‘nourriture’
- Tawellemmet (Niger) atšu ~ <sup>E</sup>itattu ‘manger’
- Tahaggart (Algeria) əkš<sup>20</sup> ‘manger, ronger’ ; intensif tâtt

<sup>19</sup> Cf. *imzad* ‘poil’ if z < \*<sup>s</sup> through phonotaxis.

<sup>20</sup> This can be accepted only if -ts- > -kš-. This word is possibly a loanword: Cf. Chadic \*k\_d ‘tooth’.

- Taneslemt (Mali) tətt ‘manger souvent’
- Zenaga okši ‘dent’<sup>21</sup>; iča ‘manger’; teḍiḍi ‘nourriture’
- Tamaziɣt (Morocco) ətš ~ itett ‘manger’
- Tarifit (Morocco) tətt ‘manger souvent’; présent itət; passé yašša
- Iznassen (Morocco) tətt ‘manger souvent’
- Mzab (Algeria) intensif tətt
- Wargli (Algeria) əšš ‘manger’; intensif tətt
- Snus (Algeria) tətt ‘manger souvent’
- Kabyle (Algeria) čč-iɣ ‘j’ai mangé’; ye-čč-at ‘il l’a mangé’; itetṭ ‘manger souvent’
- Ghadames (Libya) ičč ‘il mangea’; tett ‘manger souvent’; sešš ‘faire manger’

*Examples with a voiced laryngeal*

Jour [daylight] \*har/hal Cf. Orel & Stolbova (1995:262).

1. Afrasian forms: Egyptian *hrw* ‘jour’, Buduma (Central Chadic) *yirow* ‘jour’, Bidiya (East Chadic) *ira* ‘jour’

2. Berber forms:

- Kabyle (Algeria) azal ‘clarté du jour, pleine chaleur’
- Tawellemmet (Niger) azəl ‘jour’
- Tayrt (Niger) azəl ‘jour’
- Tahaggart (Algeria) ahəl ‘jour’

Vent [wind] \*√\*haw Cf. Orel & Stolbova (1995:260).

1. Afrasian forms: Arabic (Semitic) *hāwiya* ‘air’, Bachama (Central Chadic) *hawey* ‘vent’, Mwulyen (Central Chadic) *howo* ‘vent’,

2. Berber forms:

- Tamazight azwu ‘vent’
- Zenaga aḏəwun ‘vent’

Grand, gros [large, big] \*√\*h\_b\_r Cf. Orel & Stolbova (1995:231).

1. Afrasian forms: Arabic (Semitic) *habir* ‘très charnu (chameau)’, Arabic (Semitic) *hibriğ* ‘grand et corpulent (homme)’, Arabic (Semitic) *hibil* ‘grand de taille; lourd’, Hausa (West Chadic) *bálò-bálò* ‘grand (se dit d’un fruit)’, Mofu (Central Chadic) *babəl* ‘devenir grand, épais’, Ndam (East Chadic) *bəl* ‘grand’

2. Berber forms:

- Kabyle (Algeria) uzur (Past zūr) ‘gros, épais’
- Taçawit (Algeria) zzur ‘être gros’
- Chenoua (Algeria) azwar ‘gros’
- Mzab (Algeria) zziwər ‘être gros’
- Wargli (Algeria) žziwər ‘être épais, gros’
- Tamazight, Tachelhit (Morocco) zur ‘épais’
- Iznassen zwər ‘être gros’
- Snus uzzur ‘être gros’

---

<sup>21</sup> Same problem as in Tahaggart. Cf. Chadic \*k\_d ‘tooth’.

- Figig zwər 'être gros'
- Tarifit (Morocco) uzzur 'devenir épais'
- Ghadames (Libya) zwər (Past zuwwər) 'gros, épais'
- Siwa (Egypt) a-zwâr 'grand' ; zwər 'être gros'
- Augila (Libya) zuwer 'gros'
- Ghat (Libya) zwer 'gros'
- Tahaggart (Algeria) huher 'gros'
- Tawellemmet (Niger) izwar 'grand'
- Tayrt (Niger) izwar 'grand'
- Tadaght (Mali) šuhar 'gros'
- Zenaga zow(w)ər 'gros' (with z instead of expected ž)

Sexe [Genitalia of child, man or woman] \*b\_h (and \*b\_ts) Cf. Orel & Stolbova (1995:78-79).

1. Afrasian forms: Egyptian *bh* 'pénis', Copte ⲃⲁⲏ, Ⲙⲁⲏ 'pénis' (with <?> in Crum), Arabic *būh* 'organes de la génération' (chez les deux sexes),

2. Berber forms:

- Siwa (Egypt) bašša 'vagin'
- Nefusa (Lybia) a-beššaš 'pénis (enfant)'
- Tachelhit (Morocco) i-bešši 'vagin, vulve'
- Figig abšiš 'pénis'
- Tamazight (Morocco) abšiš 'vagin' (Variant *afšiš*)
- Tarifit (Morocco) abeššun ; a-bəččun 'vagin'
- Iznassen (Morocco) a-bəččun 'vagin'
- Chenoua (Algeria) habebbušt 'pénis'
- Semlal (Morocco) bəssi 'vagin'
- Beni Snus (Morocco) abešlul 'verge' ; a-bəččun 'vagin'
- Kabyle (Algeria) a-bbuš 'pénis'
- Wargli (Algeria) id ɸiɸi 'bite' (vulgar word)
- Wargli (Algeria) tabəššult 'parties génitales (d'un homme)'
- Taçawit (Algeria) ta-bešnunt 'pénis'
- Ntifa a-beššiš 'vagin, vulve'<sup>22</sup>

Two different roots are possibly represented in Berber: \*b\_h '(male)' and \*b\_ts '(female)' with many interferences.

---

<sup>22</sup> Another form *a-bəssi* 'vagina' may be from \*b\_ts.

References

Cf. [http://www.swarthmore.edu/SoPAci/jaldere1/bbiblio2\\_june01.txt](http://www.swarthmore.edu/SoPAci/jaldere1/bbiblio2_june01.txt)

AIKHENVALD, A.Y.

1988. A structural and typological classification of Berber Languages // *Progressive tradition in African and Oriental Studies Special Issue*. n°21. p.37-43. Berlin: Akademie Verlag.

ALLATI, A.

1986. *Phonétique et phonologie d'un parler amazigh du Nord-Est marocain (parler des Ait Saïd)*. Thèse de III<sup>e</sup> cycle. Université de Provence. Aix-Marseille.

ALOJALI, Ghoubeïd

1980. *Lexique Touareg-Français*. Copenhague: Akademisk Forlag.

AMEUR, M.

- 1990 A propos de la classification des dialectes berbères // *Études et Documents Berbères*. 7.

APPLEGATE, Joseph R.

- 1970 The Berber Languages // Thomas A. Sebeok (ed.). *Current Trends in Linguistics*. vol. 6. *Linguistics in South-West Asia and North Africa*. The Hague: Mouton.

BASSET, André

- 1929 *La langue berbère. Morphologie. Le verbe - Etude de thèmes*. Paris.

- 1952 (1969) *La langue berbère*. Oxford University Press.

- 1957 *Articles de dialectologie berbère*. Paris: Klincksieck.

- 1961 *Textes berbères de l'Aurès (Parler des Ait Frah)*. Paris.

BEGUINOT, F

- 1931 *Il Berbero Nefûsi di Fassâto (Grammatica, testi raccolti dalla viva voce, vocabolarietti)*. Roma.

BLAŽEK, Václav

- 2004 Some basic Berber verbs in Afroasiatic context // NAIT-ZERRAD, Kamal, VOSSSEN Rainer & IBRISZIMOW Dymitr (ed.). 2004. *Nouvelles études berbères. Le verbe et autres articles*. Köln: Rüdiger Köppe. pp.15-28.

BOHAS, Georges

- 1997 *Matrices. Etymons. Racines*. Leuven: Peeters.

BOMHARD, Allan

- 2008 *Reconstructing Proto-Nostratic. Comparative Phonology. Morphology. And Vocabulary. 2. Vol.* Leiden: Brill.

BOUDOT-LAMOTTE, A.

- 1964 Notes ethnographiques et linguistiques sur le parler berbère de Timimum // *Journal Asiatique* t. 252. p.487-558.

BOULIFA, S. A.

- 1913 *Lexique kabyle-français.* Alger.

CADI, K.

- 1982 Le berbère, langue ou dialecte ? // *Actes de la première rencontre de l'Université d'été d'Agadir.*

CHAKER, Salem

- 1984 *Textes en linguistique berbère (introduction au domaine berbère).* Paris: CNRS.

- 1986 Ahaggar (linguistique) // *Encyclopédie berbère, III.* pp. 303-304.

- 1989/1990 *Berbères Aujourd'hui.* Paris. L'harmattan : *Imazighen Ass-a.* Alger: Bouchène.

- 1991 *Une décennie d'études berbères (1980-1990). Bibliographie critique.* Alger: Bouchène.

- 1992 *Unité et diversité de la langue berbère. Unité et diversité de tamaziyt.* (Colloque international. Ghardaïa. 20-21 avril 1991). Tizi-Ouzou: FNACA.

- 1995 *Linguistique berbère : Études de syntaxe et de diachronie.* Paris: Peeters.

CHAKER, Salem; ZABORSKI, Andrzej (éds.)

- 2000 *Études berbères et chamito-sémitiques. Mélanges offerts à Karl-G. Prasse.* Paris-Louvain: Peeters.

COHEN, David

- 1968 Langues chamito-sémitiques // Martinet André (ed.). *Le langage.* Paris: La Pléiade. p.1288-1330.

CORTADE, Jean-Marie

- 1969 *Essai de grammaire touareg.* Alger: Institut de recherches sahariennes.

DALLET, J.M.

- 1982 *Dictionnaire kabyle-français (parler des Ait-Mangellat. Algérie).* Paris.

DELHEURE, J.

- 1984 *Ağraw n yiwalen tumzabt t-tfransist - Dictionnaire mozabite-français.* Paris.



- 1987 *Agerraw n iwalen teggargrent tarumit - Dictionnaire ouargli-français*. Paris.
- DESTAING, E.
- 1914 *Dictionnaire français-berbère (dialecte des Beni Snous)*. Paris.
- 1920 *Etude sur le Tachelhit de Sous*. Paris.
- DROUIN, J.; ROTH, A (éd.)
- 1993 *A la croisée des études libyco-berbères (mélanges offerts à Paulette Galand-Pernet et Lionel Galand)*. Paris.
- EHRET, Christopher
- 1995 *Reconstructing Proto-Afroasiatic*. Berkeley. University of California Press.
- de FOUCAULT, Charles
- 1951 *Dictionnaire touareg-français (dialecte de l'Ahaggar)*. Paris.
- GALAND, Lionel
- 1988 *Le berbère // Jean Perrot (éd.). Les langues du monde ancien et moderne*. David Cohen (éd.). *Les langues chamito-sémitiques (t.3)*. Paris: CNRS.
- HEATH, Jeffrey
- 2006 *Dictionnaire touareg du Mali : tamachek-anglais-français*. Karthala Editions.
- HUYGHE, G.
- 1906 *Dictionnaire français-chaouia*. Qamus rumi caui. Alger.
- 1907 *Dictionnaire chaouia-arabe-kabyle & français*. Qamus caui-arbi-qbaili u rumi. Alger.
- IBANEZ, Fr. E.
- 1944 *Diccionario Español-Rifeño*. Madrid.
- 1959 *Diccionario Español-Sinhayi (Dialecto bereber de Senhaya de Serair)*. Madrid.
- LAOUST, E.
- 1918 *Étude sur le dialecte berbère des Ntifa. Grammaire. textes*. Paris: Publications de l'École supérieure de langue arabe et de dialectes berbères de Rabat.
- KOSSMANN, Maarten
- 1997 *Grammaire du parler berbère de Figuig (Maroc oriental)*. Paris-Louvain.
- 1999 *Essai sur la phonologie du proto-berbère*. Köln: Köppe.

LANFRY

1968 *Ghadames (étude linguistique et ethnographique)*. Fort-National.

1973 *Ghadames II (glossaire du parler des Ayt Waziten)*. Fort-National.

LOUALI, Naima.

1990 *L'emphase en berbère. étude phonétique. phonologique et comparative*. Thèse de doctorat. Université Lumière Lyon 2.

LAOUST, E.

1912 *Etude sur le dialecte berbère du Chenoua*. Paris.

1932 *Siwa I (son parler)*. Paris.

LOUBIGNAC, V.

(?) *Etude sur le dialecte berbère des Zaïan*. Angers.

Mc CLELLAND, Clive W.

2004 *A Tarifit Berber-English Dictionary*. Lampeter: Edwin Mellen Press.

MITCHELL, T.F.

1957 Some properties of Zuara nouns with special reference to those with consonant initial // *Mémorial André Basset* p.83-96. Paris.

NAIT-ZERRAD, Kamal.

*Dictionnaire des racines berbères*. SELAF.

NEHLIL

1909 *Etude sur le dialecte de Ghat*. Paris.

NICOLAS, F.

1953 *La langue berbère de Mauritanie*. Mémoire de l'institut français d'Afrique noire. n°33. Ifan-Dakar.

OREL, Vladimir E. ; STOLBOVA, Olga. V.

1995 *Hamito-Semitic Etymological dictionary. Materials for a reconstruction*. Leiden: Brill.

OUNISSI, Mohamed Salah

2003 *Amawal s Tçawit Tafransist Taârabt* [Dictionnaire Chaoui Français Arabe]. Alger: ENAG éditions.

PARADISI, U.

- 1960 Il berbero di Augila (materiale lessicale) // *Rivista degli Studi Orientali* 35. p.157-177.
- 1963 Il linguaggio berbero di El-Fogaha (Fezzan) (testi e materiale lessicale) // *Annali N.S.* 13. p.93-126.

PELLAT, C.

- 1955 *Textes berbères dans le parler des Ait Seghrouchen de la Moulouya*. Paris.

PRASSE, Karl

- 1957 Le problème berbère des radicales faibles // *Mémorial André Basset*. Paris.
- 1960 Notes sur la langue touarègue (d'un séjour à Tamanrasset) // *Acta Orientalia* 25. p.43-111. Copenhague: Akademisk Forlag.
- 1969 *A propos de l'origine du H touareg (Ta-Haggart)*. Copenhague.
- 1972-74 *Manuel de grammaire touareg I-VII*. Copenhague.
- 1993 Du nouveau sur la vocalisation de la Tahaggart // *J. Drouin & A. Roth*. p.269-285.
- 2003 *Dictionnaire Touareg-Français (Niger)*. Université de Copenhague.

PROVASI, E.

- 1973 Testi berberi di Žado (Tripolitania) in *Annali* 33 (N.S. 23). p.501-530.

RENISIO, A.

- 1932 *Étude sur les dialectes berbères des Beni Iznassen, du Rif et des Senhaja de Sraïr. Grammaire. textes et lexique*. Paris. Publications de l'Institut des hautes Études marocaines. XXII.

ROESSLER, O.

- 1964 Libysch-Hamitisch-Semitisch // *Oriens* 17. p.199-216.

SAA, F.

- 1995 *Aspects de la morphologie et de la phonologie du berbère parlé dans le ksar Zenaga à Figuig (Maroc)*. Thèse pour le doctorat Paris III.

STROOMER, Harry

- (to come ?) *Dictionnaire Tachelhit-Français*.

TAIFI, M.

- 1991 *Dictionnaire tamazight-français (Parlers du Maroc central)*. Paris.

TAINE-CHEIKH, Catherine

- 2004 Les verbes à finale laryngale en zénaga // NAIT-ZERRAD, Kamal, VOSSEN Rainer & IBRISZIMOW Dymitr (ed.). *Nouvelles études berbères. Le verbe et autres articles*. Köln: Rüdiger Köppe. pp.170-190.
- 2008 *Dictionnaire zénaga-français. Le berbère de Mauritanie présenté par racines dans une perspective comparative*. Köln. Rüdiger Köppe Verlag (Berber Studies 20).

TAKÁCS, Gábor

- 1999 *Etymological Dictionary of Egyptian, Vol. I: A Phonological Introduction*. Leiden: Brill.
- 2000 Some Berber Etymologies III // CHAKER, Salem (ed.). *Etudes berbères et chamito-sémitiques. Mélanges offerts à Karl-G. Prasse*. Paris-Louvain: Peeters. pp.333-350.
- 2002 *Etymological Dictionary of Egyptian, Vol. 2: b-, p-, f-*. Leiden: Brill.
- 2004 The origin of Ahaggar h in an Afro-Asiatic Perspective // NAIT-ZERRAD, Kamal, VOSSEN Rainer & IBRISZIMOW Dymitr (ed.). *Nouvelles études berbères. Le verbe et autres articles*. Köln: Rüdiger Köppe. pp.191-204.
- 2008 *Etymological Dictionary of Egyptian, Vol. 3: m-*. Leiden: Brill.

VYCICHL, W.

- 1949 Histoire de la langue berbère // *Actes du XXIe Congrès International des Orientalistes*.
- 1983 *Dictionnaire étymologique de la langue copte*. Leuven: Peeters.

WILLMS, A.

- 1972 *Grammatik der südlichen Berberdialekt*. Glückstadt.
- 1980 *Die dialektale Differenzierung des Berberischen*. Berlin: Reimer Verlag.