

TO : UNICODE TECHNICAL COMMITTEE
FROM : VAISHNAVI MURTHY YERKADITHAYA
SUBJECT : REPLIES TO SCRIPT AD HOC RECOMMENDATIONS (L2/16-342) AND
 COMMENTS (L2/17-182) ON TIGALARI PROPOSAL (L2/16-241)
DATE : 30 SEP 2017

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KEY : Quoted recommendations from above documents = blue text. Replies = black text.

Replies to :
 (L2/16-342) Recommendations to UTC #149 November 2016 on Script Proposals (p. 2-3)

1. The diphthongs should be handled as units without formal decompositions. A table, similar to Table 12-30 for Malayalam in The Unicode Standard 9.0 (TUS), should be included in the proposal. (Hence, remove the decomposition information on pages 6 and 7.)

The decomposition information has been removed and the document updated.

2. To handle representation of vocalic L and vocalic LL, the situation in Bengali (§12.2 in TUS, p. 467ff.) may be used as a guide. In Bengali, a font implementation can choose whether the ligature of the C + vowel combination is the default. If the non-ligated form is the default, then ZWJ can be used as a hint to request the ligature form. If the ligated form is the default for a font implementation, then ZWNJ can be used to block the ligature (see figures 12-11 and 12-12 in TUS). The post-base form does not require a ZWNJ, but should be encoded as an independent vowel.

Resolved. Third alternate version of vocalic LL sign has been deleted because it is extremely rare.

3. Provide a full list of the ligature forms occurring with virama, and identify the default shape. Are there only four (K, T, TT, and N), or is there evidence for more (as suggested in footnote 18 on page 13)? Depending upon the answer, chillus may need to be encoded.

There is no need to encode *Chillakshara* in Tegalari as indicated in the document : Comments on encoding the Tegalari script - Srinidhi A and Sridatta A - L2/17-182 (p.10). Changes have been made accordingly in the proposal. The default forms are identified. Any remaining forms identified in the future will not be recognised as default forms as they would be rare.

4. In the example on the top of page 14, the first ZWNJ is not needed:

This behaviour in Malayalam according to The Unicode Standard 9.0 (TUS) (p.501) mentions :

"Explicit Candrakkala. The sequence <C₁, virama, ZWNJ, C₂>, where C₁ and C₂ are consonants, may be used to request display with an explicit visible candrakkala, instead of the default conjunct form."

In Tigalari, the default KA+Virama form is :

It is not yet established if the *Chandra Virama* (𑌗) form is preferred over the ligature form (𑌗𑌘) to represent retroflexion for Tulu language in Tigalari. The default form for KA is the ligature form. In the proposal, a new function has been added. The ZWNJ applied before the *Chandra* from stops the *Chillu* from forming and breaks the cluster. This eliminates the need to add another ZWNJ after the *Virama*.

𑌗𑌘 = 𑌗 + 𑌘 + 𑌘 + 𑌘 + 𑌘 + 𑌘
 |KULU |KA |ZWNJ |virama |LA |virama

The Chillu version of the same can be represented by adding the ZWNJ after the *Virama*. This allows for greater control over the representation.

𑌗𑌘 = 𑌗 + 𑌘 + 𑌘 + 𑌘 + 𑌘 + 𑌘
 |KULU |KA |virama |ZWNJ |LA |virama

-
5. Section 5.5 mentions that conjuncts can be formed horizontally or vertically. Do the two orientations need to be differentiated? If so, sequences with ZWJ or ZWNJ could be used, as in Malayalam.

Document L2/17-182 also mentions, "...both ligatures and Stacks are equivalent in Tigalari. To handle *Virama and consonant conjuncts the Virama model used for Grantha can also be applied to Tigalari.*"

Yes, the ZWJ and ZWNJ Malayalam model implemented for Tigalari as-well. This can allow for easy switching between the Ligature versions A & B while typing. Tigalari however does not have formalised sets of ligatures so far like Malayalam does but this functionality can be enabled nevertheless.

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6. Section 8 "Other / Punctuations / Symbols" mixes together character function with a listing of characters. We suggest re-organizing this section into the different graphical elements (and not function.

The elements have been re-organised.

-
7. Include a section on "pushpika" (instead of listing it by the function "period"), and describe how it is used. Adjust the text in §6.1 (p. 18) and names list accordingly, so "pushpika" refers to the graphical symbol, and not a function.

This change has been incorporated under *Alankaara*.

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8. Create a new section for flower mark describing its use, and note that to represent it in text, FLOWER PUNCTUATION MARK (U+2055) should be employed.

This change has been incorporated under *Alankaara*.

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9. Create a section on “dandas” and note that the Devanagari dandas should be used in Tigalari (unless the author feels a case can be made for script-specific dandas).

This change has been made.

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10. In section 10.1 “Collation”, note that the collation should be modelled on Tamil Grantha, but comment on anything unusual (i.e., if the standard collation for Tigalari varies from the usual Brahmic default collation).

This change has been made.

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11. In section 10.2 “Character Properties”, follow the properties based on one of Anshuman Pandey’s Indic script proposals.

This change has been addressed.

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12. Section 7 “Digits” notes that Kannada digits are commonly used. A new section on “Script Extensions” should be added to the proposal, asking that the Kannada digits U+0CE6..U+0CEF should be extended for use with Tigalari.

This has been added in the updated proposal.

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13. Section 8.6 “Candrabindu” should probably be separately encoded. As a result, modify the text on the top of page 24.

This change is reflected under Section 8.1.: *Visarga, Chandra Anunaasika, Anuswara. Chandrabindu* is replaced by *Chandra Anunaasika*.

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14. The names list on pages 27 and 29 should probably include the characters for the Dravidian vowels, E and O.

These are retained.

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15. In answer to the question on page 68 about the number of empty cells required for additional characters: At the moment, the current block can stand as allocated on the Roadmap (six columns), but the block could be expanded to eight, if needed. If chillus are encoded, seven columns may be needed. If the block is extended, “Sharada extensions”, currently assigned to the two columns U+113E0..U+113FF, should be moved.

The *Chillus* will not be separately encoded for Tigalari as discussed under section 5.4 : *Virama*.

-
16. The ad hoc will need to examine more closely the correction mark (tiddu) (pp. 22-23) and the reph (p. 23) when reviewing the next version of the proposal.



There are a few additional changes made to the Reph in the updated proposal. Reph+Virama ligature behaviour has been defined.

Replies to :

(L2/17-182) Comments on encoding the Tigalari script - Srinidhi A and Sridatta (May 26, 2017)

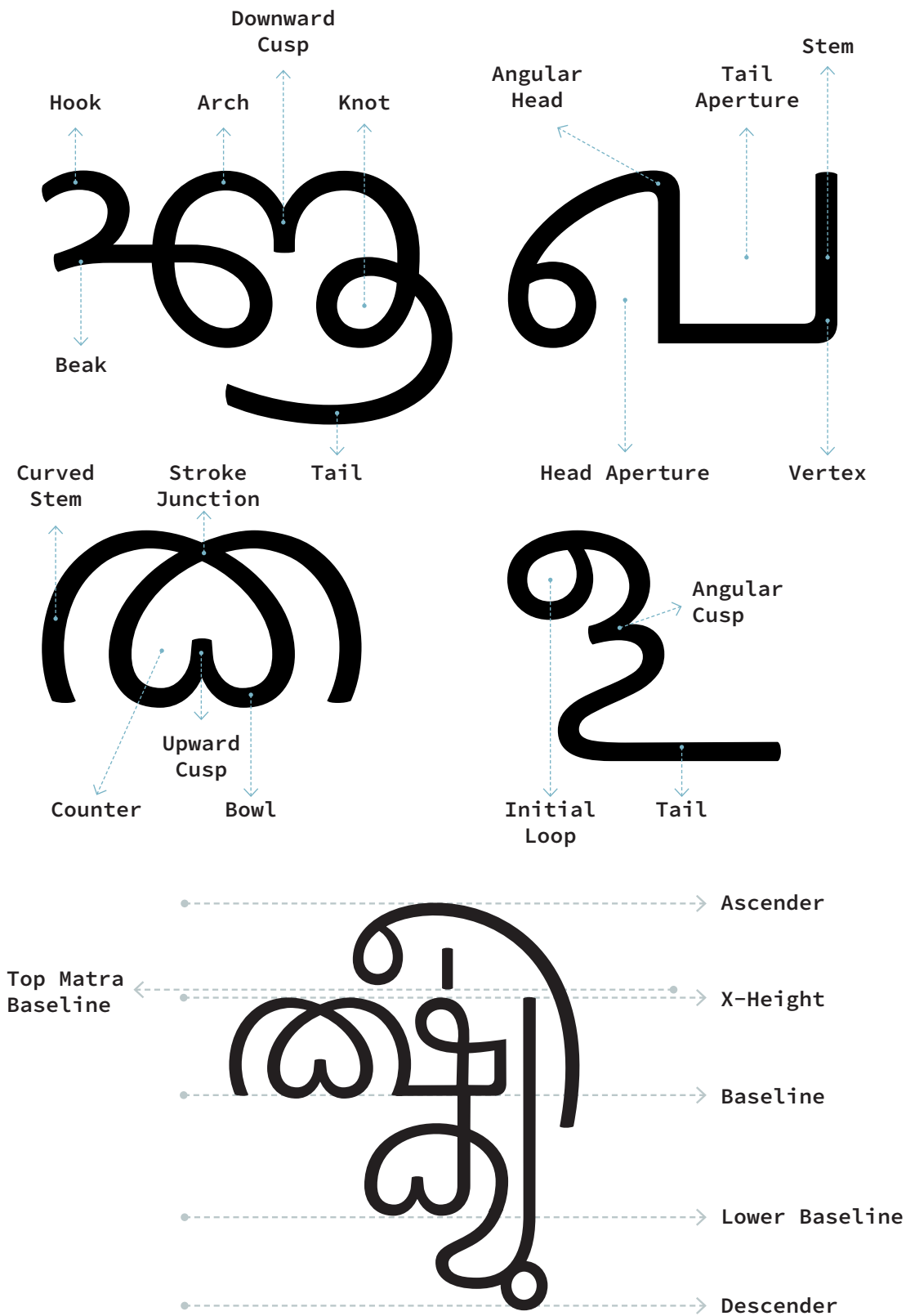
(The comments found in L2/17-182 are simplified below by the author to make it easier to go through. The draft document was studied closely by Srinidhi and Sridatta and the feedback given is of great value.)

To begin with, its important to note that as of now, there is no Tigalari standard. Tigalari exists almost entirely in the hand-written form on manuscripts. Most manuscripts have several quirks worth looking into. One does not find any formal guidelines for this script either and the many documented character sets by prominent institutions and researchers of Tigalari are seen containing misinterpretations and mistakes.

Depending on the sample set of manuscripts one is accustomed to, some glyph shapes and behaviours seem more accurate than the rest. This is but obvious. One could call this the sample-set bias. To get a balanced view of Tigalari, the sample set that was referred to in-order to decide the glyph shapes in the proposal has been collected from across the Tulu and Malanad regions. And across several libraries and archives throughout India. There are several glyphs that have more than one commonly occurring form. For example, in the case of Tigalari Letter A, the glyph shape  is preferred in and around Udupi district.  is preferred in Mangalore district. We find hundreds of manuscript samples with both these forms. As far as the encoding for Tigalari is concerned, it does not make much of a difference which of these two glyph shapes is used to represent the code-point. Both of these canonically and semantically equivalent forms and are seen frequently in manuscripts. They have the same behaviour and either can be used to represent this character in a Unicode proposal.

Based on a general logic of how the glyph shapes behave as a set of rhythmic patterns that are easily identifiable, it is possible to choose one commonly occurring glyph shape over the other. Since Tigalari has many identically constructed glyph shapes, special attention has been paid to keep them easily identifiable in their ligated forms as-well.

To minimise ambiguity, a basic Tigalari character anatomy is added here :



17. Section 1.1 : The characters which require major glyph change :

17.1. KHA needs to be changed to ഐ (The current glyph KHA ഐ is confusable with CA ച)

The about mentioned changed in the shape seems to be based the Malayalam KHA. Tigalari KHA form that appears in most commonly in manuscripts are: ഐ & ഐ.

There are several subtle changes made to the Draft poposal. One of them is the glyph shapes. The changes made below address the issue of confusing shapes between these characters that tend to appear similar in Manuscripts :

	Old	New
KHA	ഐ	ഐ
PA	പ	പ
PHA	പ	പ
CA	ച	ച
YA	യാ	യാ (YA has not changed. Added here to compare)

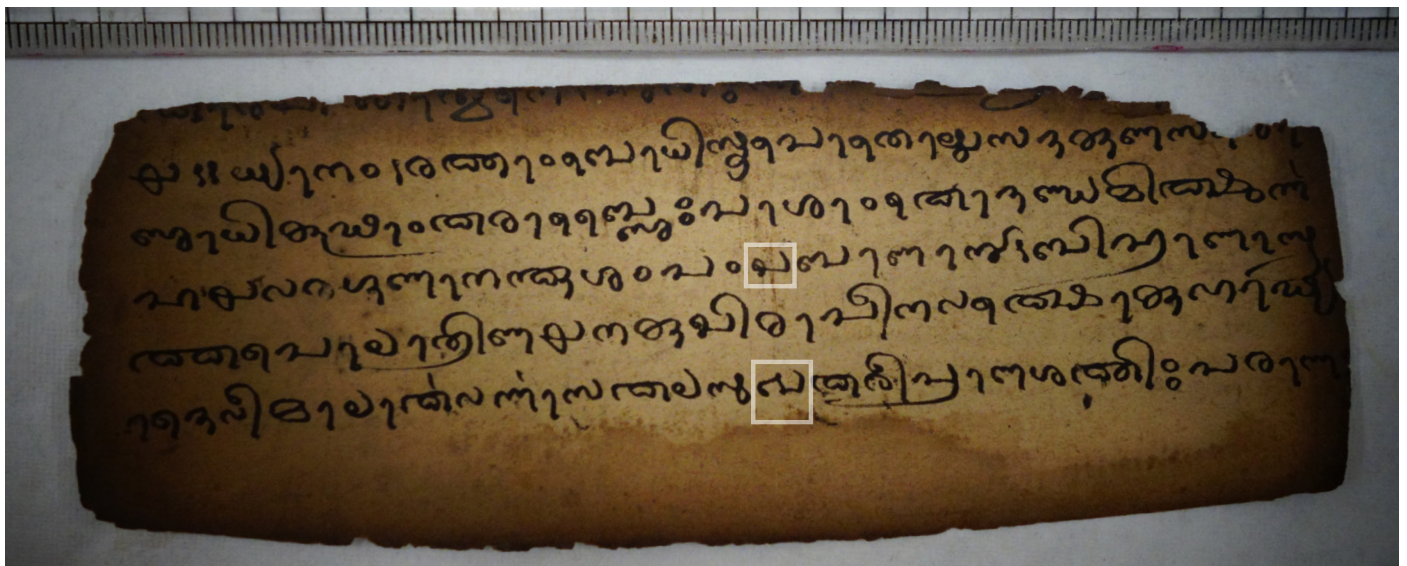


FIGURE 1.

In the above sample, the highlighted character on top is CA (ച) and below is KHA (ഐ). This form with an exaggerated angular head is often seen in manuscripts. This feature will make it stand apart from CA and reduce the confusion.

SOURCE

From the private collection of Ramesh Bhat, Bangalore. A beautiful set of pages with good quality handwriting for sampling. Paper Manuscript. Not dated.

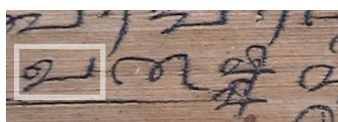


FIGURE 2.

The above character is CA (ച) as the word CATUSSSA (चतुष्) suggests. CA often appears in manuscripts with an initial loop.

SOURCE

Kaverimahatmya. Udipi, Goivind Pai Research Institute.

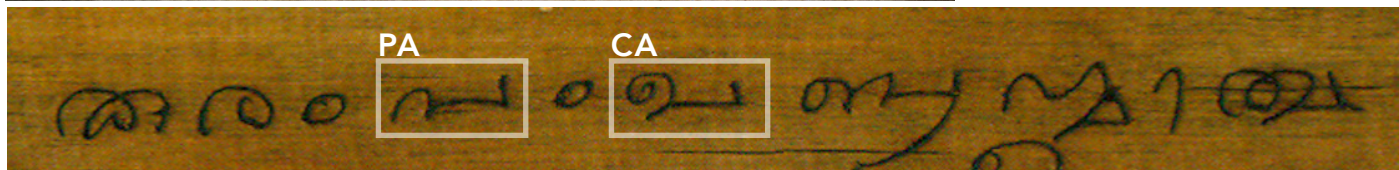
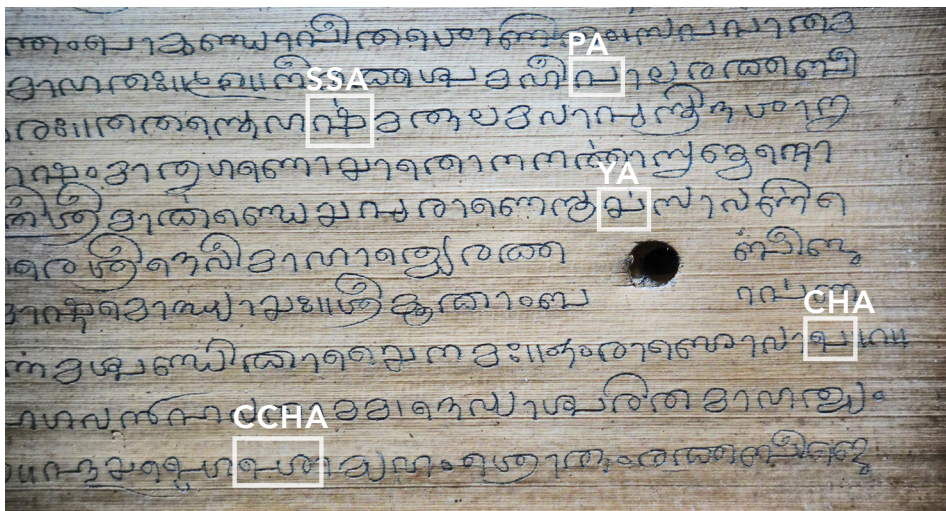


FIGURE 3.

Highlighted above are Letters SSA, PA, YA, CCHA & CHA. Initial loop of CA has been added (ച) to the default Tigalgari set to keep it distinct from PA (പ), PHA (പാ) and YA (യാ). Also, this form with the initial knot is very common as discussed in Figure 2. The curved head of PA is made smaller to stress the same distinction while keeping PA closer to the manuscript forms and consistent with the letter SSA (ഷ).

SOURCE

Above : Oriental Research Institute, Mysore. (Possibly Garudapurana)

Below : Private collection. Udupi.



FIGURE 4.

Highlighted letters on the first line read "PUUJITAPUSSPAI". The third line has the letter 'PHA' highlighted and the surrounding word reads "DEVIMAHAATMYA PHALA". The front hook of the letters does not touch the baseline but the word is readable. It is quite common for the hook of 'PA' & 'PHA' to not touch the baseline—making this letter very similar to 'CA'. The distinctive beak of 'CA' we see used for 'PA' and 'PHA' here as-well. These characters are not necessarily very wide either. In the proposal however, 'PA' & 'PHA' have their hooks touching the baseline and made noticeably wide. This alternate form is seen in several manuscripts as-well but not as common as the above example. However, the marginally less common glyph shape is used as the default shape to make the script less ambiguous.

SOURCE

From a private collection, Puttur, Mangalore District.

17.2 Letter CHA : The current glyph ചാ does not represent CHA. It represents the conjunct CCHA (CA+VIRAMA+CHA). Change shape to ഛ.

This is an important correction. This correction of making the default glyph shape for the Letter CHA from ചാ to ഛ will be reflected in the updated Tigalari proposal as suggested.

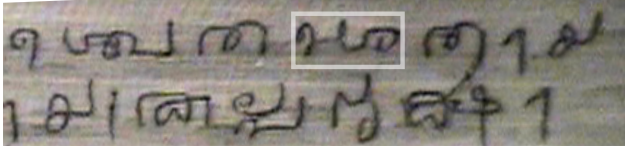


FIGURE 5.

This glyph does represent the letter CHA in a few occasions as seen here describing the one with the white umbrella as SHWETACHATRAAYA. This is however rare.

SOURCE

Dodmane private collection. Udupi District.

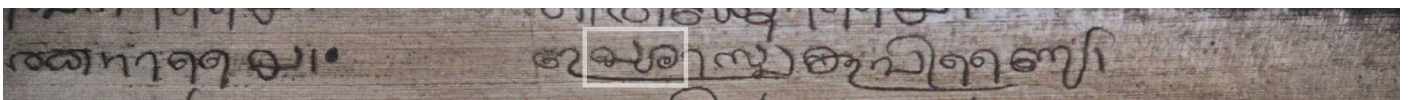


FIGURE 6.

The more frequent representation of this letter as seen across Tigalari manuscripts is of 'CCHA' as stated in the document L2/17-182. Highlighted above are these letters from the words ICCHAA (ഇച്ഛ, ഇച്ഛാ).

SOURCE

From the private collection of Krishna Rao, Shimoga district.

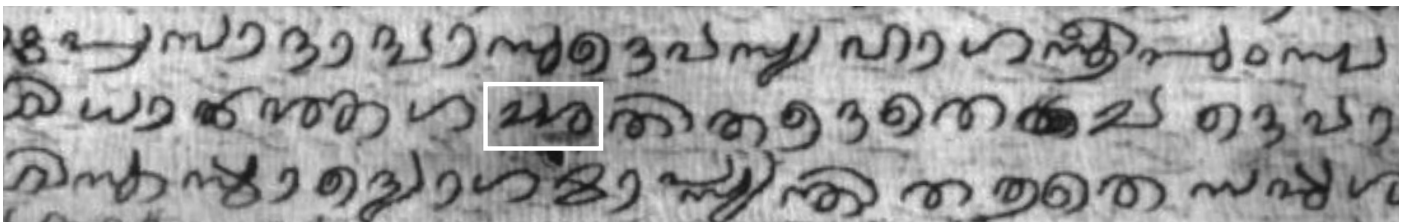


FIGURE 7.

The conjunct character CCHA (LETTER CA + LETTER CHA) is marked above as it appears in the *Sarvamoolagrantha*. Here, it appears in the word AAGACCHATI (आगच्छति).

SOURCE

Sarvamoolagrantha (From Udupi Mutt). Digitised by Taraprakashana. Bangalore.

17.3. JHA : ജ is the major glyph attested in manuscripts. The same should be used in Code chart. The current glyph is likely a variation of the Standard form.

Another popular variant of JHA glyph shape is suggested here. This suggestion has been incorporated.

17.4. NYA : small initial knot െ is the glyph used in manuscripts.

Yes, െ is a common form as-well. TIGALARI LETTER NYA is seen in several forms across manuscripts. The characters NGY and NYA have been updated in the proposal as-well, but are slightly different from the suggestion :

	Old	New
NGA	െ	െ
NYA	െ	െ

NGA (െ) and NYA (െ) characters create a lot of confusion in their liated forms. Letters like AA (െ), AA (െ), JA (െ), NA (െ), TA (െ), NNA (െ) and SA (െ) ligate to reflect similar anatomical patterns. To avoid this, and keeping true to the manuscript forms the updated glyph shapes have been created.

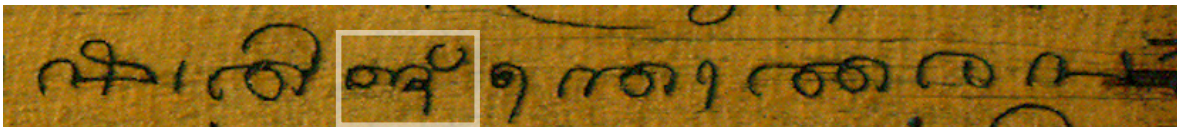


FIGURE 8.
Letter NGA + *Virama*

SOURCE
Keladi Museum Archives

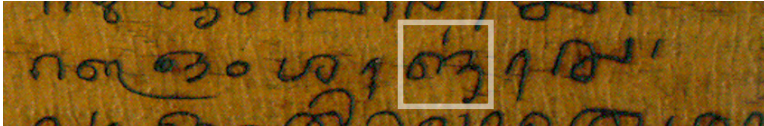


FIGURE 9.
शार्ङाय (Letter NGA + *Reph*) (The Repha form in Devanagari is misbehaving)

SOURCE
Keladi Museum Archives

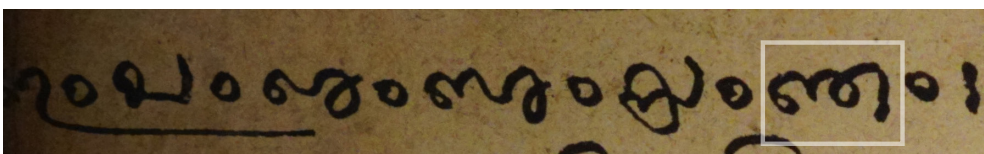


FIGURE 10.
Letter NYA
SOURCE
From the private collection of Ramesh Bhat, Bangalore.

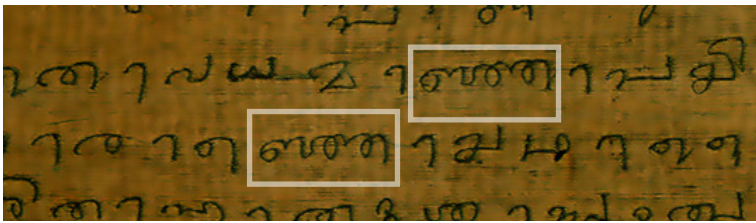


FIGURE 11.

Conjunct JNYA (൬൭ + ൽ)

SOURCE

Keladi Museum Archives

17.5. DDA & DDHA change to ധ & ധ് from ധ & ധ്

This suggestion has been incorporated in the updated proposal. There are several other characters like A, AA, UU, GHA, BHA, MA where the alternate forms shown in the table are seen quite often as-well. It is a matter of deciding what character shape would work best as a set. In this case, either one of the forms will work. From a code-point perspective such details will not matter.

17.6. RRA : change to റ് (is the major glyph) from റ (cursive variation found in few manuscripts). റ് should be employed in Code chart.

The above mentioned switch in the default RRA shape has been incorporated.

17.7. VOWEL SIGN VOCALIC RR The current glyph റ് appears in Malayalam manuscripts. The form in Tigalari is different from that of Grantha and Malayalam. It is generally written as റ്

This change has been made, however, the shape varies slightly from the suggestion above : റ്. It is true that the earlier shape is found in the Tigalari manuscripts of the Mangalore-Kasargod border regions. The updated shape is the alternate form commonly seen in Tigalari.

17.8. 113D2 The current glyph റ appears to be a handwritten variant. The original glyph is composed of two semi-circular like elements facing each other.

We find many variations of this form. This glyph remains unchanged as the റ form is seen widely across the regions where Tigalari manuscripts are found. Attestations found in the Draft proposal document, under appendix, Figure 23. Also refer figure 22, 23 in this document. The semi-circular form can be added as a variant.

18. Section 1.2 : The characters for which minor glyph changes are suggested. The shapes of characters listed below are correct, but some minor changes are suggested to keep uniformity in shapes with other characters.

18.1. UU : The glyph ് is recommended over ്.

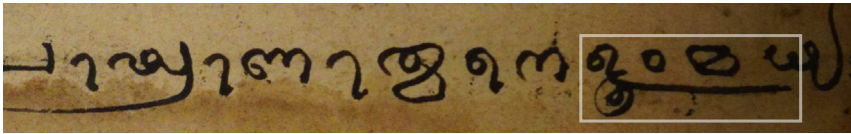


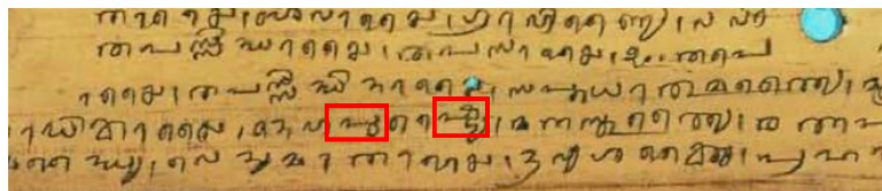
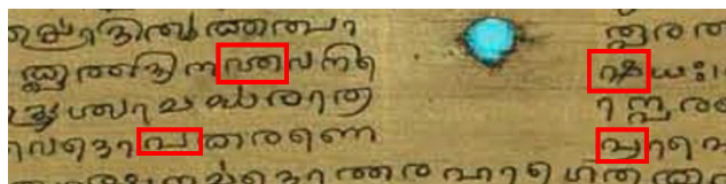
FIGURE 12.

This glyph remains unchanged as seen in the image above. There is a revival of Tigrigali script happening now with people who are interested in learning Tigrigali (as mentioned in the proposal). There are several subtle cues across the font which suggest structure of translating this font into hand-written forms as they appear in manuscripts. This easy translation from a digital glyph shape to a handwritten one, is of importance to the revival Tigrigali.

SOURCE

From the private collection of Ramesh Bhat, Bangalore.

18.2. The glyphs SSA, EE and AI can be changed. Image from the document :



Here we can notice the shapes of PA, EE and SSA should be similar. However current PA, EE and EE are dissimilar in shapes. The glyphs of EE and SSA may be changed to EE, EE. Correspondingly AI can be changed.

The glyph shapes for these characters in the proposal are : PA (PA), EE (EE), AI (EE) and SSA (EE) as discussed under remark 17.1. While this observation is valid, in a few handwriting styles these behaviours vary as seen in the image below :

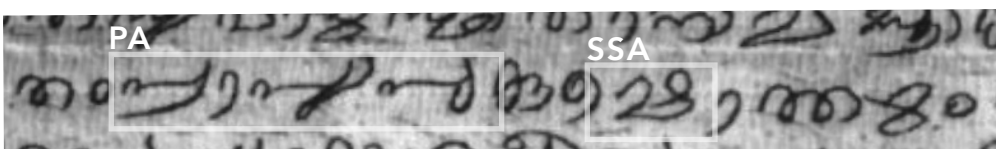


FIGURE 13.

Letters PA and SSA are marked above

SOURCE

Sarvamoolagrantha (From Udupi Mutt). Digitised by Taraprakashana. Bangalore.

18.3. VOCALIC RR : The knot can be made smaller.

The kots of R (ꣳ) and RR (ꣳꣳ) are made to appear harmonious and the shapes are retained.



FIGURE 14.

Vocalic R is (ꣳ) based on the shapes as seen in the above example.

SOURCE

Private collecton. Kollur.

18.4. Other characters : It is natural in handwriting, some characters lean towards left or right. It is suggested that Standardized glyphs may be linear in appearance. (Character name, Current glyphs and Suggested glyphs are from the document L2/17-182.)

The glyph shapes that are updated in the current proposal are under "New". These shapes have been arrived at after careful study of several factors; handwriting style being one of them.

Character name	Current glyphs	Suggested glyphs	New :
OO	ꣳ	ꣳ	ꣳ
AU	ꣳꣳ	ꣳꣳ	ꣳꣳ
NGA	ꣳ	ꣳ	ꣳ
JA	ꣳ	ꣳ	ꣳ
TTA	ꣳ	ꣳ	ꣳ
NNA	ꣳ	ꣳ	ꣳ
DA	ꣳ	ꣳ	ꣳ
BA	ꣳ	ꣳ	ꣳ
VA	ꣳ	ꣳ	ꣳ
SHA	ꣳ	ꣳ	ꣳ
SA	ꣳ	ꣳ	ꣳ

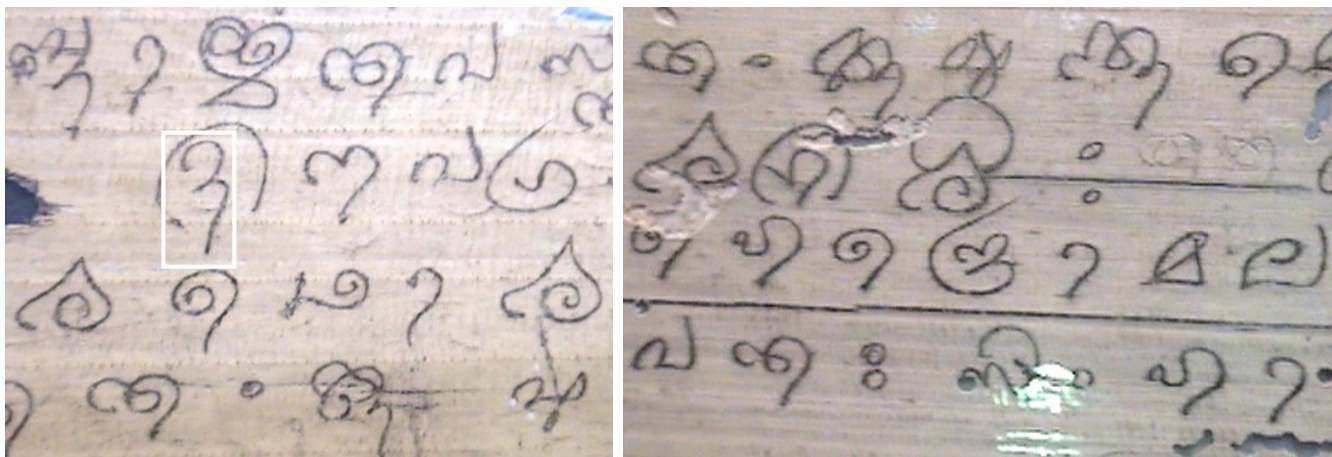


FIGURE 15.

Here is an example of a student practicing characters and experimenting with them on a palm leaf manuscript. This manuscript is over a hundred years old. There are a few characteristic features one can find exaggerated in a few glyphs here. One of them is the letter DA. It does not have the bottom stroke curving upwards (as seen in Malayalam). This behaviour of DA is also seen in 80% of the Tigalari manuscripts examines so-far. It is from looking for the underlying structures peculiar to Tigalari that a lot of characters have been standardised. The inclination to move towards the standardised geometric shapes of reformed Malayalam and Kannada needs to be questioned at every stage. Following the style used in the current Malayalam script might not be appropriate for Tigalari in several places for Tigalari despite both of them being similar.

SOURCE

Ramanath Achar, Udupi

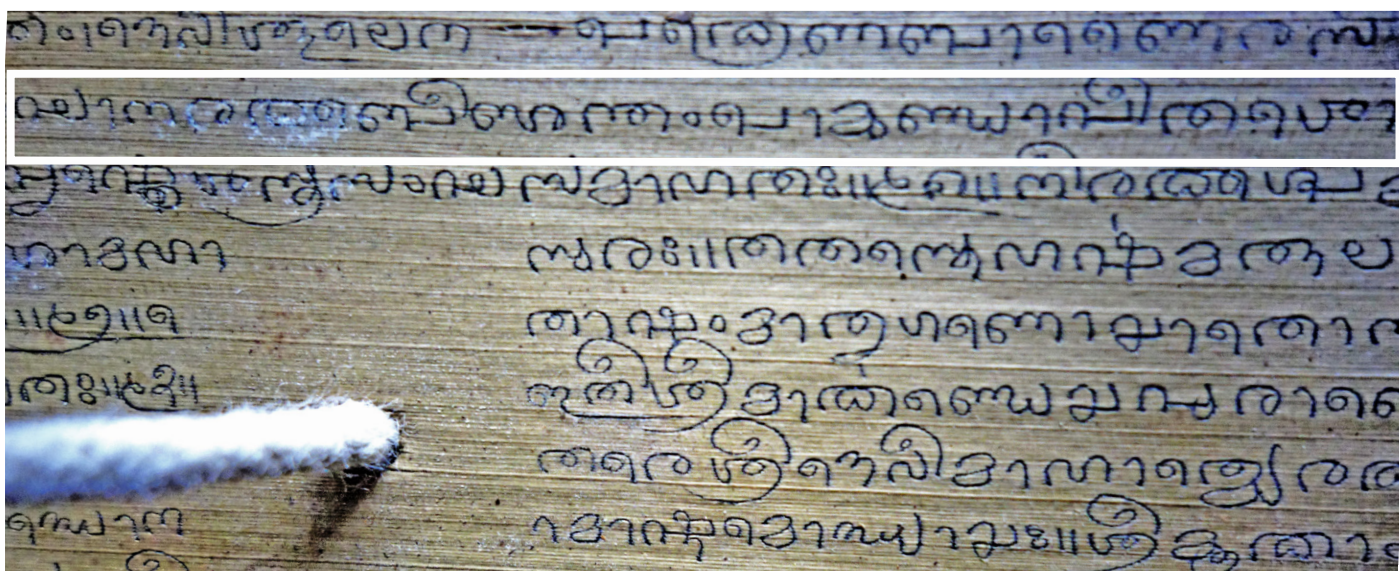


FIGURE 16.

GHAA + NA + RA + KTA + BHI + JA + NTA + Anuswara + CHAA + MU + NNDA + PII + TAA + SHAA.
 Please note the letter CHA looks like letter KHA here. However, for letters BHA & JA, the initial counters are modified to resemble NNA as suggested. In new set, GHA is also modified to make it consistent with the letter PA and SSA.

SOURCE

Keladi Museum Archives

19. Section 2 : Vowel signs

19.1. Section 2.1 : This section gives details of VOWEL SIGN U & UU combinations.

This table will be added to the updated document. These lists are very useful to have and gives great clarity to the ligature forms.

19.2. Section 2.2 : Contextual form vowel sign Vocalic R. Similar to Devanagari, Kannada, Bhaiksuki and so on, when VOWEL SIGN VOCALIC R occurs with RA, the sequence is written as repha placed above the vowel VOCALIC R (ॠ). Similarly, the phonological sequences can be extended to the other vocalic sounds (rr, l, ll).

This has been added. The input sequence of *Reph* appearing with Vocalic R is added to the proposal. This behaviour is seen in Sanskrit as-well. Instead of representing it as RA+Vocalic R (Vowel Sign), its added as RA+Virama+Vocalic R. This behaviour will also be extending this to letters Vocalic RR and Vocalic L (not LL) as suggested. These sounds are present in Tulu language as-well.

19.2. Section 2.3 : Vowel signs of Vocalic L & LL :

The document also refercs to Vowel signs of Vocalic L & LL placed below and to the right; ligating (p.9) : This cannot be considered as an alternate form as it a conjunct which is also seen in other south Indian scripts. kl is sometimes written by this sequence kl (KA+Virama+ LA+ Virama) as seen here . The script ad hoc report L2/16-342 says “*To handle representation of vocalic L and vocalic LL, the situation in Bengali (§12.2 in TUS, p. 467ff:) may be used as a guide. In Bengali, a font implementation can choose whether the ligature of the C + vowel combination is the default. If the non-ligated form is the default, then ZWJ can be used as a hint to request the ligature form. If the ligated form is the default for a font implementation, then ZWNJ can be used to block the ligature (see figures 12-11 and 12-12 in TUS).*” The above representations involving ZWJ and ZWNJ are not required as it is not an alternate form.

The first two forms are retained. The LA+Virama is not canonically equal to vocalic L and therefore this suence cannot be applied to the alternate Vocalic L vowel sign. This is discussed further in the proposal (Section 5.2, page 10).

Placed above the base and to the right:

This is deleted as there is not enough documentation available currently to take this further.

20. Section 3 : Virama

20.1. In Tulu, semi-circular Virama mark represents an equivalent of Samrutokaram (Front unrounded and back retroflex vowels for A and E sounds) present in Malayalam. Should they be encoded separately? Our opinion is it should be represented using Virama. It should not be encoded separately as in Malayalam.

Agreed. Discussed further in the updated proposal.

20.2. Do chillaksharas need separate encoding? Since Tigalari is used primarily for Sanskrit, its standard behaviour is different to how it'll behave for Tulu. The chillus do not carry the un-rounded sounds when used for Tulu and only the context of Tulu is a Char+Semi-Cir. Virama ≠ ChilluCharacter.

In Sanskrit both forms (ligated and unligated) are semantically equal. Even in Tulu the ligated forms also carry un-rounded sounds. The unrounded sound can be represented with either Char+Semi-Cir.Virama or ligated virama (Chillu like characters). Hence are both forms whether in Sanskrit/Tulu are semantically equal, separate encoding is inessential. It is seen in Figure 14 of the proposal. The script ad hoc report says “Provide a full list of the ligature forms occurring with virama, and identify the default shape. Are there only four (K, T, TT, and N), or is there evidence for more (as suggested in footnote 18 on page 13)?”

In addition to K, T, TT and N, ligated forms are also seen in G and sometimes for M...

Agreed. The *Chillus'* standard behaviour is of suppressing the inherent vowel 'A'. The un-rounded sound behaviour is not established yet in Tulu for Tigalari script. We find both the legated and *Chandra* forms of *Virama* representing this schwa sound. In general, in written form today, the *Chadra Virama* form is considered to represent Tulu sounds. Manuscript samples represent experimentations with Tigalari script and Tulu language and are not recommended to be adopted unexamined. Its because of these factors that *Chillus* don't need separate encoding.

There is no need to encode these two forms separately as of now as there is further research that remains to be done on this subject. A complete list of the Ligature forms will be provided once there is enough information regarding this as discussed under point 3 in this document.

20.3. The form of M similar to Grantha 𑌨 is seen in few [Tigalari] manuscripts. It is not commonly seen in manuscripts.



FIGURE 17.

SOURCE

Image provided in the document L2/17-182 (p.11)

Image on the left : The highlighted letter may-be THA from the word ATHA SAPTASHATI... Letter THA is seen written this way in several manuscripts and does seem a lot like the 'M' form one is used to seeing in Grantha, Malayalam or Kannada manuscripts. Early Telugu-Kannada inscriptions very often have this form as-well. This character is a direct reference to its Brahmi-early Grantha roots.

As there are not many examples of this form in Tigalari, (but there is a good possibility of this existing as they also exist in Kannada manuscripts) this character is not included. It would be interesting to look into this topic.

21. Section 4 : Characters whose encoding is not required

Some of the proposed characters need additional research and their encoding is not required at present. The details are given as follows.

21.1. Section 4.1 : Short (hrasva) E and O .

As said in proposal TIGALARI LETTER O & TIGALARI LETTER E are not present in the traditional Tigalari orthography. These two characters are essential for writing Tulu and Kannada languages. As there are no attestations available and other scholars and users may suggest different shapes for them. We request to reserve the code points for these vowels and their vowel signs. They may be proposed in future after having consensus on their encoding from native users and scholars.

These are representative glyphs for now and would not conflict with the use. Instead, it will stop the nomenclature of substituting the O and E with OO and EE as seen happening in Malayalam.

21.2. Section 4.2 : Digits

In general Tigalari script uses Kannada digits. The proposed digits are similar to Malayalam and manuscripts provided in Figures 20 & 21 appear to be in Malayalam script rather than Tigalari. The letter forms, style and orthography closely resemble Malayalam script. Other sources provided are based analysis of these manuscripts. If these manuscripts belong to Malayalam script, independent encoding of digits is not required.

Tigalari numerals appear in manuscripts from around the Kasargod region. We do find a slight influence of Malayalam in these manuscripts but the script is predominantly Tigalari. A few of these manuscripts are also written in Tulu language.

It is also true that majority of Tigalari manuscripts use Telugu-Kanarese numerals. Despite this, its useful to include the Tigelari numerals found in a small number of manuscripts as-well. Tigelari is not a thoroughly researched script and of the few manuscripts found, we already find several examples of these numerals being used.

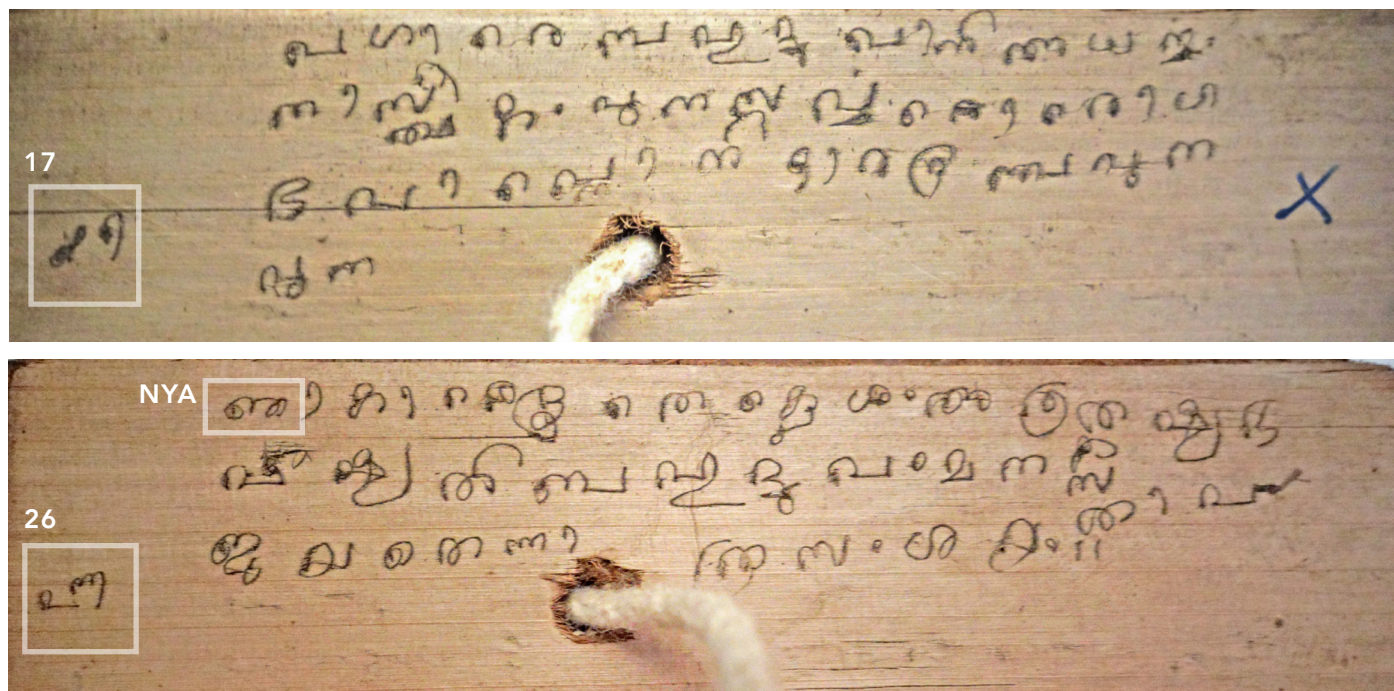


FIGURE 18.

Tigelari numerals' attestations as requested. Also found here is an example of the letter NYA as reflected in the font.)

SOURCE

Keladi Museum Archives

21.3. Section 4.3 : TIDDU SIGN. This character is not unique to Tigelari; it is also attested in other Indic scripts. It is reasonable to encode in a generic block instead in Tigelari.

I would recommend encoding it for Tigelari separately.

21.4. Section 4.4 : SHRIL. (𑒗) appears to be joined form of (𑒗). Both forms may be 1. read as a ligature 2. a symbol indicating beginnings, pauses, endings or space fillers. There is no need to distinguish them in plain text. Its independent encoding needs further examination and it is not required to encode it at present.

The *Alankaara* form of *Shrii* (𑒗) needs separate encoding. Quoting from the updated proposal : "Both these forms can appear within the same manuscript. While version 1.(𑒗) is read as a ligature, version 2. (𑒗) can be a either *Shrii* ligature or a symbol indicating beginnings, pauses, endings or space fillers. Due to these differences and the frequency of use of both these forms, the symbol form of *Shrii* needs to be encoded as a separate character and the glyph plotted twice in a font. These two representations are semantically/canonically different despite being visually identical "

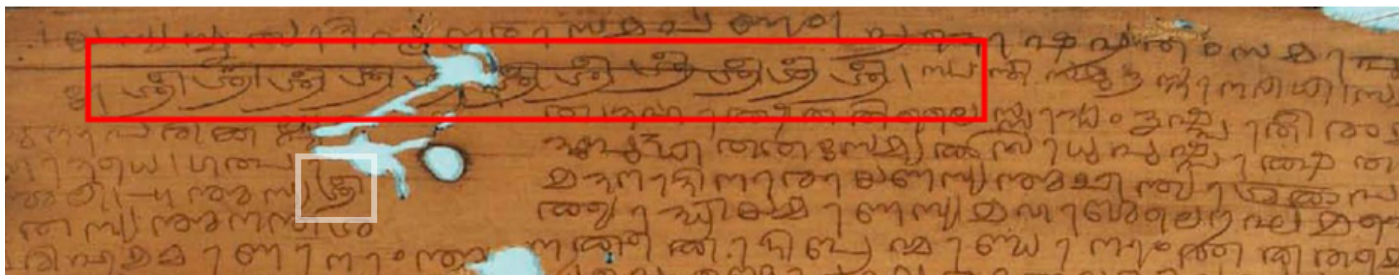


FIGURE 19.

The image provided in the document (shown above) uses *Shrii Alankaara* form over the unusable (torn) part of the palm leaf. This is highlighted in red. Below this, marked in white is another *Shrii* form which is part of the text. While documenting this manuscript there is no way to make this distinction (that we come across very often in Tigalari manuscripts) unless we encode both these forms separately.

SOURCE

Image provided in the document L2/17-182 (p.12)

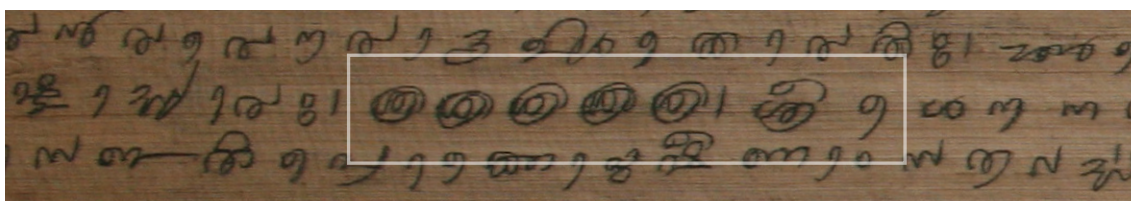


FIGURE 20.

A row of *SRI Alankaara* (not part of the text but part of the manuscript) followed by a single *danda*, followed by the letter *SHRII* (part of the text). These characters are semantically different.

SOURCE

Private collection. Pajaka, Udupi district.

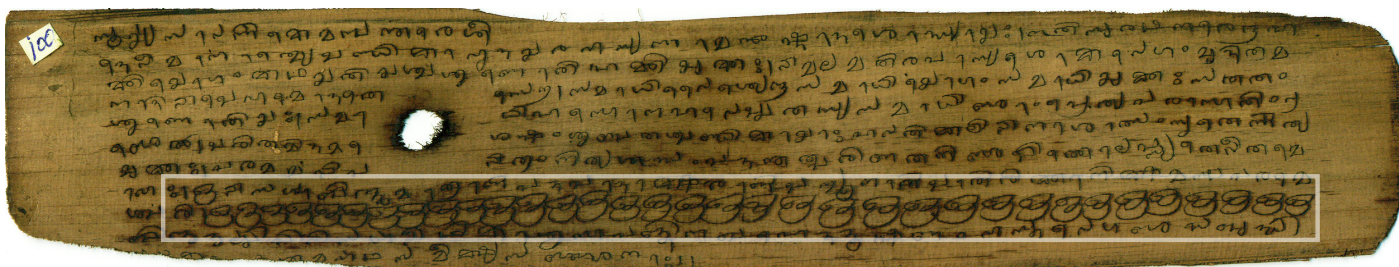
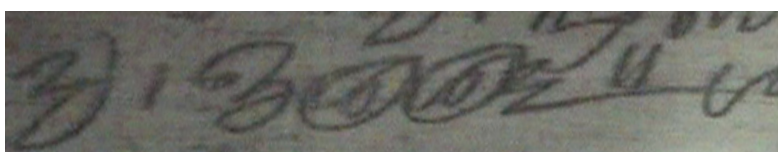


FIGURE 21.

In the above image we see both *Om* and *Shrii Alankaara* together with *Danda*, double *Danda* and the often spotted zig-zag line. In the below image, a row of *Om Alankaara*. Its behaving as a space filler here similar to *Shrii Alankaara*. (A *Pushpika* is categorised as just a space filler).

SOURCE

Private collection. Sural, Udupi District.

22. Section 5 : New characters which require encoding

22.1. Section 5.1 : PLUTA

The current proposal is quite complex for the first proposal to encode Tigalari. Collating these various Vedic marks and submitting as a separate detailed proposal by the authors of the document L2/17-182 is recommended.

22.2. Section 5.2 : ANUNASIKA

Anunasika indicates nasalization of a vowel or a semivowel. It is widely used in Tigalari. The function is similar to candrabindu of other scripts. It is different from Anusvara which indicates pure nasal as seen in below folios.

As stated under 22.1, submitting as a separate proposal is recommended for these marks.

22.3. Section 5.3 : GEMINATION MARK

As stated under 22.1, submitting as a separate proposal is recommended for these marks.

22.4. Section 5.4 : DOUBLE END OF TEXT

The proposal recommends the name PUSHPIKA which means flower for 113D2. It is mainly used in end of texts and sections. The symbol does not seem to be derived from Flower. PUSHPIKA generally refers to A8F8 DEVANAGARI SIGN PUSHPIKA which also used in Tigalari. Instead of the name PUSHPIKA we suggest the name of like PUNCTUATION END OF TEXT or END OF TEXT MARK.

This section has been rewritten to avoid ambiguity. *Pushpika* has be renamed to *Alankaara* for the same purpose.

Section 8.2 of proposal says “In this interval (pause), one could also choose to chant Om (from which Pushpika symbol seems to be derived) 23 or Shrii.” The annotation says also used indicate Om and Period. Our opinion is that this character is not derived from Om and is not used to indicate Om.

This observation was made after having spoken to people who still read from these manuscripts. Krishnaraja Bhat from Bangalore, Ramanath Acharya from Udupi and Dr. Vighnaraj from Dharmasthala all are actively studying the Tigalari manuscripts and other language manuscripts of this region. When asked about this symbol, they all seemed to agree with this resembling the *Om* form. When individuals from the Udupi *Matha* who still read from these manuscripts were asked, they mentioned it represents that one has to chant *Om* for a brief interval when a couple of them are strung together. When there is a *Shrii* form, *Shrii* is chanted instead. The character shape pretty clearly indicates its roots as-well.

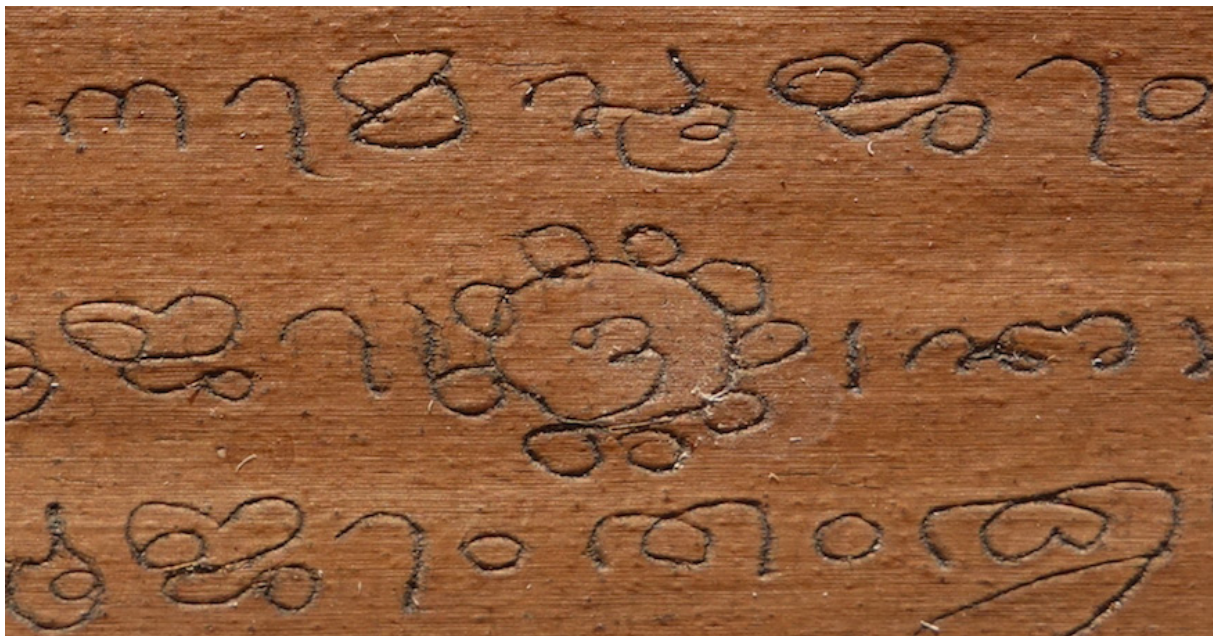
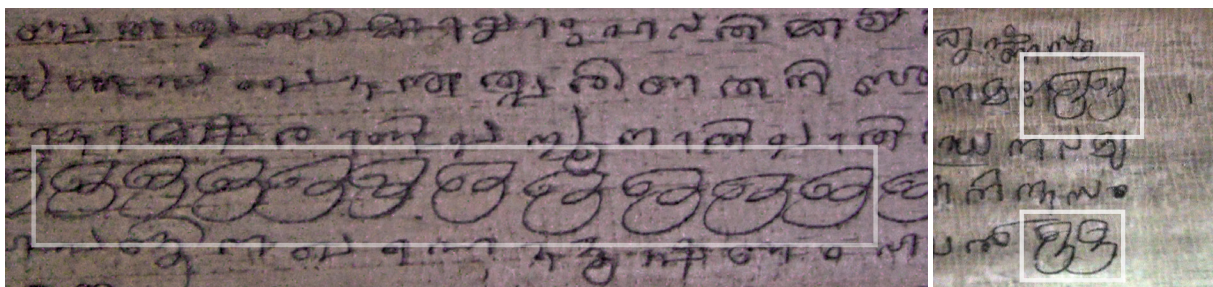


FIGURE 22.

Examples of *Alankaara* 'Om'. The bottom image clearly indicates that its a stylised OM symbol.

SOURCE

Private collection, Mangalore district.

In addition to 113D2, a double end of text is also used in Tigalari. We recommend its encoding it along with 113D2. The folios given below shows the double end of text.

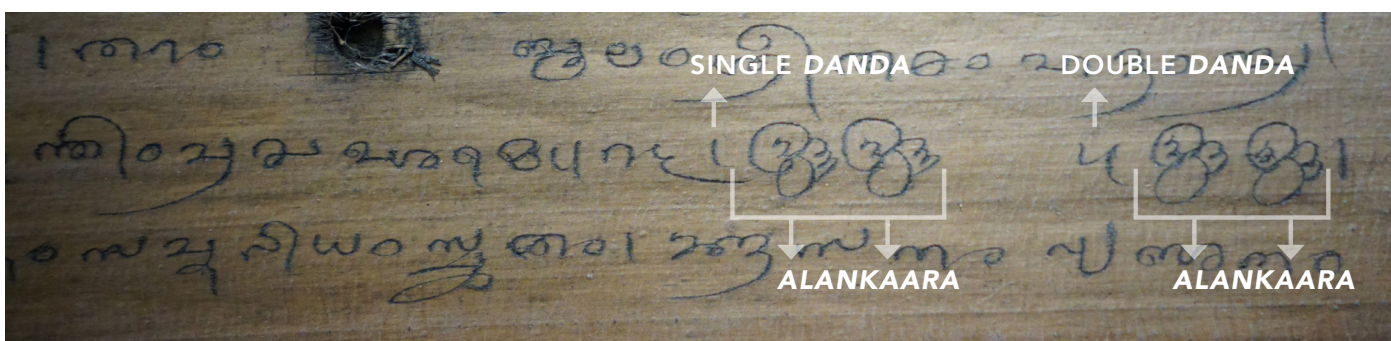


FIGURE 23.

These are also categorised under the *Om Alankaara*. The fact that the single and double *danda* surround this character make it clear that *Pushpika* are not used in this context as a text ending but a punctuation mark. Further research into 'double end of text' character is recommended.

SOURCE

Keladi Museum archives.

23. Section 6 : Script Extensions

23.1. VEDIC SIGN ARDHAVISARGA. It should be represented using 1CF2 VEDIC SIGN ARDHAVISARGA.

As stated under 22.1, submitting as a separate proposal is recommended for these marks.

23.2. Fraction signs occur in Tigalari sources (see page 23 of L2/15-243). These may be represented using characters already encoded in the ‘Common Indic Number Forms’ block L2/17-098).

As stated under 22.1, submitting as a separate proposal is recommended for these marks.

23.3. PUSHPIKA is employed in Tigalari script (see page 2 of as script extensions for Tigalari. Note on the some of the attestations used in the proposal. A8F8 DEVANAGARI SIGN PUSHPIKA is employed in Tigalari script (see page 2 of L2/17-098). These characters should be specified as script extensions for Tigalari.

Pushpika has been renamed *Alankaara* to avoid this confusion. In Tigalari it cannot be classified as merely a filler character (which in itself sounds pretty ambiguous).

23.4. Detailed comments on figures 11, 29, 30,32, 42, 43, 44, 45 appearing in the appendix having errors in them. The above figures can be analysed as charts showing use of script, but cannot be considered as genuine.

These observations are valid. Since Tigalari is not standardised, such errors and inconsistencies are expected. A note had been added to the main document to indicate this.

23.5. Figure 38 appears to be tabulated by proposal author. This also contains some incorrect forms. For example kṭa , tkha, śta, śṭa are not written as ligatures but as stack. Bh does not have ligated form of Virama. Vowel signs U and UU are used in place for Vocalic R, RR for kṛ, kṝ, bhṝ bhṝ̄ etc. We request to modify Figure 38 to correct forms.

This has been deleted to avoid confusion.

24. Section 8 : Consonant clusters

24.1. Section 5.5 Ligatures of proposal explains formation of consonant clusters. The document says “It is therefore hard to come to a consensus and identify a definitive conjunct/ligature set or form for this script. Further study into this subject is required. As of now, the alternate forms of conjuncts can be handled using the opentype feature—stylistic sets.” According to our understanding its formations are similar to Grantha and pre-reformed Malayalam. We conclude following rules after studying manuscripts... (Rules explained on pages 16, 17)

The above stated rules are already present in the proposal. The draft proposal document suggested further study into Ligature sets for 'opentype features—stylistic sets' and not the ligature behaviour alone.

For (RA/YA/VA+Virama+Consonant+Repha/Arkavottu) ligature form is to be used.

VA *Reph* ligature (ೠೡ) and YA *Reph* ligature (ೡೡ) have been added to the font and this behaviour discussed in the updated proposal.

Unlike Kannada where anusvara is preferred for combination of nasal with its respective consonant of the varga. In Tigalari consonant cluster is preferred over anusvara. The ligatures of nasal and its respective consonant of KA, CA and PA varga have special forms that are unrelated to their parent shapes.

This is mentioned in the updated proposal.

24.2. The KVA on page 15 requires some modification. It should be written as ೠೠ.

This correction has been made.

24.3. The triangular form of ge[r]mination of consonant of CA, BA, YA and VA like are not commonly seen in Standard Tigalari. If they exist, the appearance of these forms in some manuscripts is likely due to influence of Malayalam script.

Yes, these forms are influenced by the Malayalam script but exist in Tigalari manuscripts as-well.

24.4. The conjuncts similar to nka should not be analysed as NA+VIRAMA+KA. Correct the sequence of nkta in page 15 of the proposal.

This has been changed to the *Anunaasika* sequence NGA+VIRAMA+KA.

25. Modifying conjunct behavior of RKA squenence.

Yes, this was a mistake which has been corrected. Thank you.

26. Section 9 : Other comments

26.1. Names of svarita and anudatta. The proposal suggests the names as TIGALARI SVARITA and TIGALARI ANUDATTA. As in Vedic extensions and Devanagari TIGALARI SIGN/TONE SVARITA and TIGALARI SIGN/ TONE ANUDATTA is recommended to be used.

This has been changed to :

TIGALARI TONE MARK SVARITA & TIGALARI TONE MARK ANUDATTA

26.2. The proposal questions “Two part vowels / reordering / encoding: U+0D57 (Malayalam AU length mark) is provided as an encoding for the right side of the two part vowel U+0D4C (Malayalam vowel sign AU). I'm proposing to follow the same for Tigalari. Is this a good practice? In the context of Tigalari, this length mark is never used alone. (It might be a redundant practice—as advised by Cibu CJ)”

In Grantha and Malayalam AU length mark was encoded due [to] its use in modern texts, whereas vowel sign AU was generally used in older texts. In case of Tigalari only vowel sign AU is used. Encoding of AU length mark may not required as it is never used alone.

It will be useful to have the AU length mark as discussed further in the updated proposal.

26.3. NNNA is used in Tamil and Malayalam languages. As Tigalari is not used to write these languages reserving space for NNA is inessential. Also, there are several gaps in the Code chart and Code points like 113A7, 113B8, 113C9, 113CC, 113CD, 113D3. It is appropriate to keep the characters continuous instead of having gaps in the middle.

Dravidian alveolar 'n' (NNNA) is commonly found in South Dravidian languages. Tulu belongs to this family. Kannada belongs to the Central Dravidian family. Alveolar sounds are more commonly found in Southern Dravidian. This is however not as rule as we see in the case of the retroflex approximant 'zha' (LLLA) that is present in Tulu.

It is not possible to come to a consensus on the topics that have not been studied well enough yet. One can rely on the language and usage patterns as seen in similar scripts and languages. The reserved spaces are for characters that are quite likely to exist. For example, until recently the existence of the TIGALARI LETTER RRA was not attested until looked-into by Srinidhi, but the space was reserved for the character beforehand making this addition pretty smooth.

26.4. Page 5 says “*Total number of characters: 63*”. But 90 characters are proposed. Update this section.

Yes, this was a mistake which has been corrected. Thank you.

26.5. Page 12 says “*Tigalari has two characters that represent the Dravidian sounds in Tigalari: LLLA and RRA (Shakata repha). These two characters are rare and are mostly found in Kannada (language) Manuscripts*”. It should be noted here that LLLA is found in Tulu and RRA in Kannada manuscripts.

This has been changed to “*Tigalari has two characters that represent the Dravidian sounds in Tigalari: LLLA and RRA (Shakata repha). These two characters are rare and are mostly found in Tulu / Kannada (language) manuscript...*”.