

Proposal to encode the Nandinagari script in Unicode

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1 Introduction

This is a proposal to encode the Nandinagari script in Unicode. It supersedes the following document:

- L2/13-002 “Preliminary Proposal to Encode Nandinagari in ISO/IEC 10646”

2 Description

Nandinagari is a Brahmi-based script that was used in southern India between the 8th and 19th centuries CE for producing manuscripts and inscriptions in Sanskrit in south Maharashtra, Karnataka and Andhra Pradesh. It was the official script of the Vijayanagara kingdom of southern India (1336–1646). There are numerous manuscripts and inscriptions bearing Nandinagari. Several of these manuscripts are biscriptal with text in the Kannada and Tigalari (Tulu) scripts. Nandinagari was also used for writing Kannada in Karnataka.

Nandinagari derives from the central group of ‘Nagari’ scripts and is related to Devanagari. There are several similarities between Nandinagari and Devanagari in terms of character repertoire, glyphic representation, and structure (see comparisons in tables 1–4). However, Nandinagari differs from Devanagari in terms of letterforms, the lack of a connecting headline, and in the rendering of consonant-vowel combinations and consonant conjuncts. There are several styles of Nandinagari, which are properly defined as variants of this particular type of ‘Nagari’ and do not resemble styles of other members of this class. As such, Nandinagari cannot be considered a stylistic variant of Devanagari. The independent status of Nandinagari is articulated by Saraju Rath (2009), who writes:

From statements in various early and recent secondary literature [...] one could infer that Nandināgarī, Nāgarī and Devanāgarī are very close and show only minor distinctions. From a study of the available evidence in manuscripts, however, it is clear that the scripts are indeed related as sister scripts, but that there are significant and systematic differences which justify us in considering them as different scripts. In the case of Nandināgarī the separate status is very clear but because of neglect and misleading statements in secondary literature it is frequently noted that scholars who try to read the script without proper preparation fail and have to give up.

Following the above, despite its similarities to Devanagari, Nandinagari cannot be unified with the ‘Devanagari’ encoding in Unicode. The proper representation of Nandinagari in plain text requires the preservation of the glyphic distinctions of its letterforms, consonant conjuncts, and consonant-vowel ligatures. The script also has its own historical styles and variant forms of letters, which diverge from Devanagari styles. Support for Nandinagari at the character level will provide for representation of the script in plain text. The block will, in turn, offer a means for unifying various styles of the script.

There is an active community of scholars conducting research on Nandinagari in the areas of epigraphy, preservation of manuscripts, and optical-character recognition. The Sri Vadiraja Research Foundation, sponsored jointly by the National Mission for Manuscripts of the Government of India and the Puttige Math in Udupi, Karnataka has been working to preserve Nandinagari palm leaf manuscripts from 2007 to the present (Prabhu 2012). The French Institute of Pondicherry has also digitized its collection of Nandinagari manuscripts and made them available online (see <http://apps.ifpindia.org/manuscripts/>). Study of Nandinagari is also advanced through the work of independent specialists with an interest in the script, who have analyzed manuscripts and produced character inventories (see, for example, figures 17–26). Moreover, there have been recent attempts to develop technologies for optical-character recognition of Nandinagari (Guruprasad *et al* 2011, 2013). An encoding for Nandinagari in the Unicode will help to advance research, study, and preservation of the script.

3 Script Details

3.1 Structure

The general structure (phonetic order, *mātrā* reordering, use of *virāma*, etc.) of Nandinagari is similar to that of Devanagari. Several consonant-vowel combinations are written as ligatures. Consonant clusters are represented as conjuncts. Some consonants have special behaviors when they occur conjuncts. The headstroke of Nandinagari letters do not join with preceding or following letters.

3.2 Character repertoire and representative glyphs

The proposed repertoire is based upon character inventories in manuscripts (see figures 1 and 2) and those published in secondary sources, such as Grünendahl (2001) and Visalakshy (2003). The representative glyphs are normalizations of forms attested in these sources. Several characters have variant forms and these are considered glyphic variants purposes of the encoding. The glyphs used here have been designed by the proposal author.

3.3 Vowels

There are 12 vowel letters:

𑌒	NANDINAGARI VOWEL LETTER A
𑌓	NANDINAGARI VOWEL LETTER AA
𑌔	NANDINAGARI VOWEL LETTER I
𑌕	NANDINAGARI VOWEL LETTER II
𑌖	NANDINAGARI VOWEL LETTER U
𑌗	NANDINAGARI VOWEL LETTER UU

𑌒	NANDINAGARI VOWEL LETTER VOCALIC R
𑌓	NANDINAGARI VOWEL LETTER VOCALIC RR
𑌔	NANDINAGARI VOWEL LETTER E
𑌕	NANDINAGARI VOWEL LETTER AI
𑌖	NANDINAGARI VOWEL LETTER O
𑌗	NANDINAGARI VOWEL LETTER AU

The 𑌒 VOWEL LETTER VOCALIC R and 𑌓 VOWEL LETTER VOCALIC RR are also represented as a consonant-vowel combination with the letter 𑌑 RA, as:

𑌑𑌔	<𑌑 RA, 𑌔 VOWEL SIGN VOCALIC R>
𑌑𑌕	<𑌑 RA, 𑌕 VOWEL SIGN VOCALIC RR>

Distinctive letters for *VOWEL LETTER VOCALIC L and *VOWEL LETTER VOCALIC LL are not attested, but space for them has been reserved in the event that an attestation is discovered. The sound of *VOWEL LETTER VOCALIC L is represented using the letter 𑌘 LA (see figure 1):

𑌘𑌔	<𑌘 LA, 𑌔 VOWEL SIGN U>
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3.4 Vowel Signs

There are 11 dependent vowel signs:

𑌐	NANDINAGARI VOWEL SIGN AA
𑌑	NANDINAGARI VOWEL SIGN I
𑌒	NANDINAGARI VOWEL SIGN II
𑌓	NANDINAGARI VOWEL SIGN U
𑌔	NANDINAGARI VOWEL SIGN UU
𑌕	NANDINAGARI VOWEL SIGN VOCALIC R
𑌖	NANDINAGARI VOWEL SIGN VOCALIC RR
𑌗	NANDINAGARI VOWEL SIGN E
𑌘	NANDINAGARI VOWEL SIGN AI
𑌙	NANDINAGARI VOWEL SIGN O
𑌚	NANDINAGARI VOWEL SIGN AU

There is no dependent form for 𑌒 VOWEL LETTER A. This sound is the inherent vowel in each consonant letter. Distinctive forms for *VOWEL SIGN VOCALIC L and *VOWEL SIGN VOCALIC LL are not attested. Space is reserved for VOWEL SIGN VOCALIC L and VOWEL SIGN VOCALIC LL in the event that distinctive forms are identified.

The dependent vowel signs are combined with consonants in encoded representations as follows:

<i>cā</i>	𑂔	<𑂔 CA, 𑂩 VOWEL SIGN AA>
<i>ci</i>	𑂕	<𑂔 CA, 𑂪 VOWEL SIGN I>
<i>cī</i>	𑂖	<𑂔 CA, 𑂫 VOWEL SIGN II>
<i>cu</i>	𑂗	<𑂔 CA, 𑂬 VOWEL SIGN U>
<i>cū</i>	𑂘	<𑂔 CA, 𑂭 VOWEL SIGN UU>
<i>cr</i>	𑂙	<𑂔 CA, 𑂮 VOWEL SIGN VOCALIC R>
<i>cṛ</i>	𑂚	<𑂔 CA, 𑂯 VOWEL SIGN VOCALIC RR>
<i>ce</i>	𑂛	<𑂔 CA, 𑂰 VOWEL SIGN E>
<i>cai</i>	𑂜	<𑂔 CA, 𑂱 VOWEL SIGN AI>
<i>co</i>	𑂝	<𑂔 CA, 𑂲 VOWEL SIGN O>
<i>cau</i>	𑂞	<𑂔 CA, 𑂳 VOWEL SIGN AU>

The 𑂪 NANDINAGARI VOWEL SIGN I is positioned at the top right of a consonant at the edge of the headstroke. The sign is often written such that its stroke straddles the headstroke at its midpoint.

Some consonant-vowel combinations may be rendered as ligatures.

<i>ku</i>	𑂏	<𑂏 KA, 𑂬 VOWEL SIGN U>
<i>kū</i>	𑂐	<𑂏 KA, 𑂭 VOWEL SIGN UU>
<i>kr</i>	𑂑	<𑂏 KA, 𑂮 VOWEL SIGN VOCALIC R>
<i>du</i>	𑂒	<𑂒 DA, 𑂬 VOWEL SIGN U>

3.5 Consonants

There are 35 consonant letters:

𑂏	NANDINAGARI LETTER KA
𑂐	NANDINAGARI LETTER KHA
𑂑	NANDINAGARI LETTER GA
𑂒	NANDINAGARI LETTER GHA
𑂓	NANDINAGARI LETTER NGA
𑂔	NANDINAGARI LETTER CA
𑂕	NANDINAGARI LETTER CHA
𑂖	NANDINAGARI LETTER JA

𑌦	NANDINAGARI LETTER JHA
𑌧	NANDINAGARI LETTER NYA
𑌨	NANDINAGARI LETTER TTA
𑌩	NANDINAGARI LETTER TTHA
𑌪	NANDINAGARI LETTER DDA
𑌫	NANDINAGARI LETTER DDHA
𑌬	NANDINAGARI LETTER NNA
𑌭	NANDINAGARI LETTER TA
𑌮	NANDINAGARI LETTER THA
𑌯	NANDINAGARI LETTER DA
𑌰	NANDINAGARI LETTER DHA
𑌱	NANDINAGARI LETTER NA
𑌲	NANDINAGARI LETTER PA
𑌳	NANDINAGARI LETTER PHA
𑌴	NANDINAGARI LETTER BA
𑌵	NANDINAGARI LETTER BHA
𑌶	NANDINAGARI LETTER MA
𑌷	NANDINAGARI LETTER YA
𑌸	NANDINAGARI LETTER RA
𑌹	NANDINAGARI LETTER LA
𑌺	NANDINAGARI LETTER VA
𑌻	NANDINAGARI LETTER SHA
𑌼	NANDINAGARI LETTER SSA
𑌽	NANDINAGARI LETTER SA
𑌾	NANDINAGARI LETTER HA
𑌿	NANDINAGARI LETTER LLA
𑍀	NANDINAGARI LETTER RRA

Each consonant letter bears the inherent vowel /a/. This inherent vowel is silenced using 𑌀 VIRAMA. Clusters of consonants are represented as conjuncts (see section 3.7).

The 𑍀 NANDINAGARI LETTER RRA is not part of the traditional consonant inventory. It appears to have been introduced in the 11th century for transcribing the Kannada letter 𑌦 U+0CB1 KANNADA LETTER RRA (see figure 3).

3.6 Virama

The 𑌶 NANDINAGARI SIGN VIRAMA has two functions, similar to the corresponding character of Devanagari. It is used as a *halanta* for marking the absence of the inherent vowel of a consonant letter. It is also a control character that is used for producing conjuncts.

The VIRAMA ligates with the base letter at the lower right edge:

k 𑌶 <𑌶 KA, 𑌶 VIRAMA>

c 𑌶 <𑌶 CA, 𑌶 VIRAMA>

3.7 Conjuncts

Consonant clusters are represented as conjuncts. It is appropriate to adopt the Devanagari model for producing conjuncts. The control character 𑌶 NANDINAGARI SIGN VIRAMA is placed after each non-initial consonant in a cluster, ie. <(C, 𑌶 VIRAMA)*, C>. This model also uses the generic control characters 𑌶 U+200D ZERO WIDTH JOINER (abbreviated as ZWJ) and 𑌶 U+200C ZERO WIDTH NON-JOINER (abbreviated as ZWNJ) for controlling alternate representations of conjuncts. Described below are the various ways of rendering conjuncts in Nandinagari and the proposed methods for their encoded representations.

Atomic ligatures Some clusters are represented using atomic or *akhaṇḍa* ligatures, in which the forms of the constituent letters are not readily recognizable. Examples of such ligatures are:

kṣa 𑌶 <𑌶 KA, 𑌶 VIRAMA, 𑌶 SSA>

jña 𑌶 <𑌶 JA, 𑌶 VIRAMA, 𑌶 NYA>

Clusters involving the above consonants are always represented using atomic ligatures. They are not produced using the other methods shown below. However, as the encoding allows for alternate representations of conjuncts, irregular forms of these conjuncts are permitted.

Regular ligatures Conjuncts may be represented as ligatures in which the shapes of individual letters are visible.

ccha 𑌶 <𑌶 CA, 𑌶 VIRAMA, 𑌶 CHA>

tta 𑌶 <𑌶 TA, 𑌶 VIRAMA, 𑌶 TA>

tra 𑌶 <𑌶 TA, 𑌶 VIRAMA, 𑌶 RA>

dda 𑌶 <𑌶 DA, 𑌶 VIRAMA, 𑌶 DA>

ṣṭa 𑌶 <𑌶 SSA, 𑌶 VIRAMA, 𑌶 TTA>

Initial half-forms The initial letter in a cluster may be represented as a half-form if its graphical structure provides such an opportunity. Generally, if the letter has a right descender it is removed to produce a half form; the headstroke is typically retained, eg. 𑌶 → 𑌶 for the half-form of 𑌶 TA. These are represented in encoded text as follows:

tka त्क <त TA, ् VIRAMA, क KA>

Conjoined forms Conjuncts may be represented by fusing the unaltered regular forms of letters together. In order to prevent ligature formation and to preserve the regular form of letters, the control character  ZWJ is placed before VIRAMA for producing such forms. Conjoined forms are produced by joining letters together at the edges:

tpa त्प <त TA,  ZWJ, ् VIRAMA, प PA>

bda ब्द <ब BA,  ZWJ, ् VIRAMA, द DA>

stha स्त <स SA,  ZWJ, ् VIRAMA, थ THA>

As the headstroke is not generally connected in Nandinagari, a conjoined conjunction may be produced by joining the headstroke between letters in a cluster:

tpa त्प <त TA,  ZWJ, ् VIRAMA, प PA>

bda ब्द <ब BA,  ZWJ, ् VIRAMA, द DA>

The headstroke is elongated for letters without a full-width headstroke so that the conjunction is seamless. This modification occurs with क KA, which has a half-width headstroke, when it is not in a cluster that is rendered using an atomic ligature.

kśa क्श <क KA,  ZWJ, ् VIRAMA, श SHA>

Conjoined forms can also be produced for clusters in which adjacent consonants may be treated as atomic ligatures. In such cases, the atomic ligature is produced first, then the following letter is fused with it. The headstrokes of these are also joined as necessary.

kṣma क्श्म <क KA, ् VIRAMA, श SSA,  ZWJ, ् VIRAMA, म MA>

Some fused conjuncts may resemble those produced using an initial half-form, particularly when the second element is य YA.

Subjoined Some consonants are rendered as subjoined forms when they are non-initial in a cluster:

gla ग्ल <ग GA, ् VIRAMA, ल LA>

ṭva ट्व <ट TTA, ् VIRAMA, व VA>

This type of conjunct normally occurs when the initial consonant does not have a half-form and when the shape of the following consonant provides a feasible means for producing a subjoined form.

Special cases The following letters have special behaviors in conjuncts.

- TA The letter त TA can be rendered in different ways when it is initial in a cluster. The first is as a half-form, as shown above:

tka त्क <त TA, ् VIRAMA, क KA>

The other is by truncating the left stroke (त → ढ) to retain the letter as the base and to attach the following consonant as a subjoined form:

tna त्ना <त TA, ् VIRAMA, न NA>

tta त्त <त TA, ् VIRAMA, त TA>

- **YA** The letter य YA is generally represented using the post-base form ड. This form is produced by default using the sequence <C, ् VIRAMA, य YA>:

kya क्य <क KA, ् VIRAMA, य YA>

gya ग्य <ग GA, ् VIRAMA, य YA>

tya त्य <त TA, ् VIRAMA, य YA>

yya य्य <य YA, ् VIRAMA, य YA>

ṣya ष्य <ष SSA, ् VIRAMA, य YA>

When YA is non-initial it can also form conjuncts with a half-form of the initial letter. In such cases, the ZWJ ZWJ is placed after VIRAMA to produce a half-form of the initial letter:

gya ग्य <ग GA, ् VIRAMA, ZWJ ZWJ, य YA>

ṣya ष्य <ष SSA, ् VIRAMA, ZWJ ZWJ, य YA>

The sequence <YA, YA> can be rendered in two ways. The default is to use the post-base form of the second letter:

yya य्य <य RA, ् VIRAMA, य YA>

The alternative is to use a conjoined ligature:

yya य्य <य RA, ZWJ ZWJ, ् VIRAMA, य YA>

- **RA** When ढ RA is the initial consonant in a cluster it takes the form ्र, which is called *repha*. This form is the default representation of the sequence <ढ RA, ् VIRAMA, C>:

rka र्क <ढ RA, ् VIRAMA, क KA>

rṣa र्ष <ढ RA, ् VIRAMA, ष SSA>

When it is non-initial it has the form -ॠ *ra-kara*. This form is the default representation of the sequence <C, ् VIRAMA, ढ RA>:

pra प <प PA, ॠ VIRAMA, र RA>

śra श <श SHA, ॠ VIRAMA, र RA>

- RA + YA When र RA is immediately followed by य YA in a cluster, it takes precedence over the latter. The conjunct RA is rendered as *repha*:

rya र्य <र RA, ॠ VIRAMA, य YA>

The post-base form of YA is not used with RA:

rya * रय <र RA, ॠ VIRAMA, य YA>

Breaking conjunct formation As is the case in Devanagari and other Indic scripts, default conjunct formation may be modified using ZWJ ZWNJ and ZWJ ZWJ.

An atomic ligature may be rendered with visible VIRAMA or as a conjoined ligature:

kṣa क्ष <क KA, ॠ VIRAMA, ष SSA>

kṣa क्ख <क KA, ॠ VIRAMA, ZWJ ZWNJ, ष SSA>

kṣa कक्ख <क KA, ZWJ ZWJ, ॠ VIRAMA, ष SSA>

Rendering of *repha* may be prevented:

rka र्क <र RA, ॠ VIRAMA, क KA>

rka रक्क <र RA, ZWJ ZWJ, ॠ VIRAMA, क KA>

The post-base form of YA may be produced after RA:

rya र्य <र RA, ॠ VIRAMA, य YA>

rya रय <र RA, ॠ VIRAMA, ZWJ ZWJ, य YA>

3.8 Various Signs

The following signs are used as vowel modifiers:

◌◌ NANDINAGARI SIGN ANUSVARA

◌ः NANDINAGARI SIGN VISARGA

The ◌◌ ANUSVARA is used for marking nasalization. It is generally placed to the right of a base letter, but may also be placed above it. The ◌ः VISARGA is used for representing post-vocalic aspiration in words of Sanskrit origin. They are used in encoded text as follows:

kaṃ क० <क KA, ० ANUSVARA>

kaḥ कः <क KA, ० VISARGA>

3.9 Avagraha

The following character is included in the repertoire:

₹ NANDINAGARI SIGN AVAGRAHA

This sign is used for marking the elision of word-initial *a* in Sanskrit as a result of sandhi (see figure 5).

3.10 Invocation signs

The following character is included in the repertoire:

ॐ NANDINAGARI SIGN SIDDHAM

The sign ॐ SIDDHAM is a symbol used as an invocation at the beginning of documents (see figure 3).

The syllable ॐ *om* is used frequently. However, this is not an atomic character. It is represented using the sequence:

om ॐ <ॐ O, ० ANUSVARA>

3.11 Punctuation

Nandinagari uses | *daṇḍā* and || double *daṇḍā* for punctuation. These should be unified with the corresponding Devanagari characters. Script extensions have been specified in section 4.5.

3.12 Spacing headstroke

The following character is included in the repertoire:

— NANDINAGARI HEADSTROKE

The — HEADSTROKE is used as a sign of spacing or joining a word. It may be used for connecting a word that is broken on account of imperfections on a writing surface. It is also used as placeholder (see figure 6). A sequence of multiple headstrokes are generally unconnected:

— — — <— BHA, — HEADSTROKE, — HEADSTROKE, ॐ JHA>

The HEADSTROKE may also occur between *daṇḍā*-s at the end of a section:

|| — || <|| U+0965 DEVANAGARI DOUBLE DANDA, — HEADSTROKE, — HEADSTROKE,
|| U+0965 DEVANAGARI DOUBLE DANDA>

3.13 Digits

A full set of digits is used in Nandinagari:

○	NANDINAGARI DIGIT ZERO	॥	NANDINAGARI DIGIT FIVE
○	NANDINAGARI DIGIT ONE	॥	NANDINAGARI DIGIT SIX
ॐ	NANDINAGARI DIGIT TWO	॥	NANDINAGARI DIGIT SEVEN
ॐ	NANDINAGARI DIGIT THREE	ॐ	NANDINAGARI DIGIT EIGHT
ॐ	NANDINAGARI DIGIT FOUR	ॐ	NANDINAGARI DIGIT NINE

Nandinagari digits are similar to Kannada digits (see table 4). However, they are currently included in the proposed repertoire because they are used commonly in Nandinagari environments and are written in a style that matches the Nandinagari handwriting. If the differences between Nandinagari and Kannada forms are truly artificial, then it may be practical to unify these digits with the corresponding Kannada characters.

3.14 Number forms

Fraction signs occur used in Nandinagari sources (see figure 7; also L2/15-243: 22). These may be represented using characters already encoded in the ‘Common Indic Number Forms’ block (U+A830):

Corresponding character		
I	¼	I U+A830 NORTH INDIC FRACTION ONE QUARTER
II	½	II U+A831 NORTH INDIC FRACTION ONE HALF
III	¾	III U+A832 NORTH INDIC FRACTION THREE QUARTERS
¼	¼	¼ U+A833 NORTH INDIC FRACTION ONE SIXTEENTH
½	½	½ U+A834 NORTH INDIC FRACTION ONE EIGHTH
¾	¾	¾ U+A835 NORTH INDIC FRACTION THREE SIXTEENTHS

These characters are specified as script extensions for Nandinagari. The ‘Common Indic Number Forms’ are described briefly in *The Unicode Standard* (chapter 22.3 ‘Numerals’, pp. 770–771) and in more detail in the original encoding proposal (L2/07-354).

3.15 Vedic signs

Signs for Vedic notation are found in Nandinagari manuscripts (see L2/15-101: 7–9). They are not included in the proposed repertoire. The following marks for intonation are attested (the given values are tentative):

○	<i>svarita</i>
○	<i>anudatta</i>
○	<i>udatta</i>

Usage of these signs is shown in figures 12 and 13. Additional research is required to determine if these signs should be encoded as specific to Nandinagari or in the generic Vedic Extensions block (1CD0..1CFF).

Other signs, such as ॠ *jihvāmūlīya* (see figures 8, 9) and ॡ Vedic *anusvāra* (see figure 10), are attested but these may be unified with existing characters in Vedic Extensions:

Corresponding character	
ॠ <i>jihvāmūlīya</i>	ॠ U+1CF2 VEDIC SIGN ARDHAVIDARGA
ॡ <i>upadhmānīya</i>	ॡ U+1CF2 VEDIC SIGN ARDHAVIDARGA
ॢ <i>anusvāra</i>	ॢ U+1CE9 VEDIC SIGN ANUSVARA ANTARGOMUKHA

A doubled form of ॢ Vedic *anusvāra* / *anunāsika* is attested in Nandinagari manuscripts (see figure 11):

ॣ Vedic double *anusvāra*

This character is not yet encoded in Unicode, but should be considered for inclusion. If encoded, it may be allocated to the Vedic Extensions block if there is space.

3.16 Collation

The sort order for Nandinagari is as follows:

अ A < आ AA < इ I < ई II < उ U < ऊ UU < ऋ VOCALIC R < ॠ VOCALIC RR <
 ए E < ऐ AI < ओ O < औ AU < क KA < ख KHA < ग GA < घ GHA < ङ NGA <
 च CA < छ CHA < ज JA < ङ NYA < ट TTA < ठ TTHA < ड DDA < ढ DDHA <
 ण NNA < त TA < थ THA < द DA < ध DHA < न NA < प PA < फ PHA < ब BA <
 भ BHA < म MA < य YA < र RA < ल LA < व VA < श SHA < ष SSA < स SA <
 ह HA < ळ LLA < र्र RRA < ी VOWEL SIGN I < ी VOWEL SIGN II < ु VOWEL SIGN U <
 ू VOWEL SIGN UU < ृ VOWEL SIGN VOCALIC R < ॠ VOWEL SIGN VOCALIC RR <
 े VOWEL SIGN E < ै VOWEL SIGN AI < ो VOWEL SIGN O < ौ VOWEL SIGN AU <
 ् VIRAMA

The letter र्र RRA does not have a position in the traditional order. For this reason it is sorted after the last consonant ळ LLA.

4 Character Data

4.1 Character Properties

In the format of UnicodeData.txt:

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11B90;NANDINAGARI LETTER A;Lo;0;L;;;;N;;;;;
11B91;NANDINAGARI LETTER AA;Lo;0;L;;;;N;;;;;
11B92;NANDINAGARI LETTER I;Lo;0;L;;;;N;;;;;
11B93;NANDINAGARI LETTER II;Lo;0;L;;;;N;;;;;
11B94;NANDINAGARI LETTER U;Lo;0;L;;;;N;;;;;
11B95;NANDINAGARI LETTER UU;Lo;0;L;;;;N;;;;;
11B96;NANDINAGARI LETTER VOCALIC R;Lo;0;L;;;;N;;;;;
11B97;NANDINAGARI LETTER VOCALIC RR;Lo;0;L;;;;N;;;;;
11B98;<reserved>
11B99;<reserved>
11B9A;NANDINAGARI LETTER E;Lo;0;L;;;;N;;;;;
11B9B;NANDINAGARI LETTER AI;Lo;0;L;;;;N;;;;;
11B9C;NANDINAGARI LETTER O;Lo;0;L;;;;N;;;;;
11B9D;NANDINAGARI LETTER AU;Lo;0;L;;;;N;;;;;
11B9E;NANDINAGARI LETTER KA;Lo;0;L;;;;N;;;;;
11B9F;NANDINAGARI LETTER KHA;Lo;0;L;;;;N;;;;;
11BA0;NANDINAGARI LETTER GA;Lo;0;L;;;;N;;;;;
11BA1;NANDINAGARI LETTER GHA;Lo;0;L;;;;N;;;;;
11BA2;NANDINAGARI LETTER NGA;Lo;0;L;;;;N;;;;;
11BA3;NANDINAGARI LETTER CA;Lo;0;L;;;;N;;;;;
11BA4;NANDINAGARI LETTER CHA;Lo;0;L;;;;N;;;;;
11BA5;NANDINAGARI LETTER JA;Lo;0;L;;;;N;;;;;
11BA6;NANDINAGARI LETTER JHA;Lo;0;L;;;;N;;;;;
11BA7;NANDINAGARI LETTER NYA;Lo;0;L;;;;N;;;;;
11BA8;NANDINAGARI LETTER TTA;Lo;0;L;;;;N;;;;;
11BA9;NANDINAGARI LETTER TTHA;Lo;0;L;;;;N;;;;;
11BAA;NANDINAGARI LETTER DDA;Lo;0;L;;;;N;;;;;
11BAB;NANDINAGARI LETTER DDHA;Lo;0;L;;;;N;;;;;
11BAC;NANDINAGARI LETTER NNA;Lo;0;L;;;;N;;;;;
11BAD;NANDINAGARI LETTER TA;Lo;0;L;;;;N;;;;;
11BAE;NANDINAGARI LETTER THA;Lo;0;L;;;;N;;;;;
11BAF;NANDINAGARI LETTER DA;Lo;0;L;;;;N;;;;;
11BB0;NANDINAGARI LETTER DHA;Lo;0;L;;;;N;;;;;
11BB1;NANDINAGARI LETTER NA;Lo;0;L;;;;N;;;;;
11BB2;NANDINAGARI LETTER PA;Lo;0;L;;;;N;;;;;
11BB3;NANDINAGARI LETTER PHA;Lo;0;L;;;;N;;;;;
11BB4;NANDINAGARI LETTER BA;Lo;0;L;;;;N;;;;;
11BB5;NANDINAGARI LETTER BHA;Lo;0;L;;;;N;;;;;
11BB6;NANDINAGARI LETTER MA;Lo;0;L;;;;N;;;;;
11BB7;NANDINAGARI LETTER YA;Lo;0;L;;;;N;;;;;
11BB8;NANDINAGARI LETTER RA;Lo;0;L;;;;N;;;;;
11BB9;NANDINAGARI LETTER LA;Lo;0;L;;;;N;;;;;
11BBA;NANDINAGARI LETTER VA;Lo;0;L;;;;N;;;;;
11BBB;NANDINAGARI LETTER SHA;Lo;0;L;;;;N;;;;;
11BBC;NANDINAGARI LETTER SSA;Lo;0;L;;;;N;;;;;
11BBD;NANDINAGARI LETTER SA;Lo;0;L;;;;N;;;;;
11BBE;NANDINAGARI LETTER HA;Lo;0;L;;;;N;;;;;
11BBF;NANDINAGARI LETTER LLA;Lo;0;L;;;;N;;;;;
11BC0;NANDINAGARI LETTER RRA;Lo;0;L;;;;N;;;;;
11BC1;NANDINAGARI VOWEL SIGN AA;Mc;0;L;;;;N;;;;;
11BC2;NANDINAGARI VOWEL SIGN I;Mn;0;NSM;;;;N;;;;;
11BC3;NANDINAGARI VOWEL SIGN II;Mc;0;L;;;;N;;;;;
11BC4;NANDINAGARI VOWEL SIGN U;Mn;0;NSM;;;;N;;;;;
11BC5;NANDINAGARI VOWEL SIGN UU;Mn;0;NSM;;;;N;;;;;

```

```

11BC6;NANDINAGARI VOWEL SIGN VOCALIC R;Mn;0;NSM;;;;N;;;;;
11BC7;NANDINAGARI VOWEL SIGN VOCALIC RR;Mn;0;NSM;;;;N;;;;;
11BC8;<reserved>
11BC9;<reserved>
11BCA;NANDINAGARI VOWEL SIGN E;Mn;0;NSM;;;;N;;;;;
11BCB;NANDINAGARI VOWEL SIGN AI;Mn;0;NSM;;;;N;;;;;
11BCC;NANDINAGARI VOWEL SIGN O;Mc;0;L;;;;N;;;;;
11BCD;NANDINAGARI VOWEL SIGN AU;Mc;0;L;;;;N;;;;;
11BCE;NANDINAGARI SIGN ANUSVARA;Mc;0;L;;;;N;;;;;
11BCF;NANDINAGARI SIGN VISARGA;Mc;0;L;;;;N;;;;;
11BD0;NANDINAGARI SIGN VIRAMA;Mc;9;L;;;;N;;;;;
11BD1;NANDINAGARI SIGN AVAGRAHA;Lo;0;L;;;;N;;;;;
11BD2;NANDINAGARI SIGN SIDDHAM;Lo;0;L;;;;N;;;;;
11BD3;NANDINAGARI HEADSTROKE;Po;0;L;;;;N;;;;;
11BE0;NANDINAGARI DIGIT ZERO;Nd;0;L;;0;0;0;N;;;;;
11BE1;NANDINAGARI DIGIT ONE;Nd;0;L;;1;1;1;N;;;;;
11BE2;NANDINAGARI DIGIT TWO;Nd;0;L;;2;2;2;N;;;;;
11BE3;NANDINAGARI DIGIT THREE;Nd;0;L;;3;3;3;N;;;;;
11BE4;NANDINAGARI DIGIT FOUR;Nd;0;L;;4;4;4;N;;;;;
11BE5;NANDINAGARI DIGIT FIVE;Nd;0;L;;5;5;5;N;;;;;
11BE6;NANDINAGARI DIGIT SIX;Nd;0;L;;6;6;6;N;;;;;
11BE7;NANDINAGARI DIGIT SEVEN;Nd;0;L;;7;7;7;N;;;;;
11BE8;NANDINAGARI DIGIT EIGHT;Nd;0;L;;8;8;8;N;;;;;
11BE9;NANDINAGARI DIGIT NINE;Nd;0;L;;9;9;9;N;;;;;

```

4.2 Linebreaking

In the format of LineBreak.txt:

```

11B90..11B97; AL # NANDINAGARI LETTER A .. NANDINAGARI LETTER VOCALIC RR
11B9A..11BC0; AL # NANDINAGARI LETTER E .. NANDINAGARI LETTER HA
11BC1..11BC7; CM # NANDINAGARI VOWEL SIGN AA .. NANDINAGARI VOWEL SIGN VOCALIC RR
11BCA..11BD0; CM # NANDINAGARI VOWEL SIGN E .. NANDINAGARI SIGN VIRAMA
11BD1..11BD3; AL # NANDINAGARI SIGN AVAGRAHA .. NANDINAGARI HEADSTROKE
11BE0..11B9E; NU # NANDINAGARI DIGIT ZERO .. NANDINAGARI DIGIT NINE

```

4.3 Syllabic Categories

in the format of IndicSyllabicCategory.txt:

```

# Indic_Syllabic_Category=Bindu
11BCE ; Bindu # Mc NANDINAGARI SIGN ANUSVARA

# Indic_Syllabic_Category=Visarga
11BCF ; Visarga # Mc NANDINAGARI SIGN VISARGA

# Indic_Syllabic_Category=Virama
11BD0 ; Virama # Mn NANDINAGARI SIGN VIRAMA

# Indic_Syllabic_Category=Vowel_Independent
11B90..11B97 ; Vowel_Independent # Lo [9] NANDINAGARI LETTER A ..
NANDINAGARI LETTER VOCALIC RR
11B9A..11BC0 ; Vowel_Independent # Lo [4] NANDINAGARI LETTER E ..
NANDINAGARI LETTER AU

# Indic_Syllabic_Category=Vowel_Dependent
11BC1 ; Vowel_Dependent # Mc NANDINAGARI VOWEL SIGN AA
11BC2 ; Vowel_Dependent # Mn NANDINAGARI VOWEL SIGN I

```

```

11BC3      ; Vowel_Dependent      # Mc      NANDINAGARI VOWEL SIGN II
11BC4..11BC7 ; Vowel_Dependent      # Mn      [4] NANDINAGARI VOWEL SIGN U ..
              NANDINAGARI VOWEL SIGN VOCALIC RR
11BCA..11BCB ; Vowel_Dependent      # Mn      [2] NANDINAGARI VOWEL SIGN E ..
              NANDINAGARI VOWEL SIGN AI
11BCC..11BCD ; Vowel_Dependent      # Mc      [2] NANDINAGARI VOWEL SIGN O ..
              NANDINAGARI VOWEL SIGN AU

# Indic_Syllabic_Category=Consonant
11B9E..11BC0 ; Consonant            # Lo      [35] NANDINAGARI LETTER KA ..
              NANDINAGARI LETTER RRA

```

4.4 Positional Categories

In the format of IndicPositionalCategory.txt:

```

# Indic_Positional_Category=Top
11BC2      ; Top      # Mn      NANDINAGARI VOWEL SIGN I
11BCA..11BCB ; Top      # Mn      [2] NANDINAGARI VOWEL SIGN E ..
              NANDINAGARI VOWEL SIGN AI

# Indic_Positional_Category=Bottom
11BC4..11BC7 ; Bottom # Mn      [4] NANDINAGARI VOWEL SIGN U ..
              NANDINAGARI VOWEL SIGN VOCALIC RR
11BD0      ; Bottom # Mn      NANDINAGARI SIGN VIRAMA

# Indic_Positional_Category=Right
11BC1      ; Right   # Mc      NANDINAGARI VOWEL SIGN AA
11BC3      ; Right   # Mc      NANDINAGARI VOWEL SIGN II
11BCC..11BCD ; Right   # Mc      [2] NANDINAGARI VOWEL SIGN O ..
              NANDINAGARI VOWEL SIGN AU
11BCE..11BCF ; Right   # Mc      [2] NANDINAGARI SIGN ANUSVARA ..
              NANDINAGARI SIGN VISARGA

```

4.5 Script Extensions

The following characters should be extended for use with Nandinagari in ScriptExtensions.txt:

```

0964      ; # Po      DEVANAGARI DANDA
0965      ; # Po      DEVANAGARI DOUBLE DANDA

A830..A835 ; # No      [6] NORTH INDIC FRACTION ONE QUARTER..
              NORTH INDIC FRACTION THREE SIXTEENTHS

```

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	11B9	11BA	11BB	11BC	11BD	11BE
0	𑌀 11B90	𑌁 11BA0	𑌂 11BB0	𑌃 11BC0	𑌄 11BD0	𑌅 11BE0
1	𑌆 11B91	𑌇 11BA1	𑌈 11BB1	𑌉 11BC1	𑌊 11BD1	𑌋 11BE1
2	𑌌 11B92	𑌍 11BA2	𑌎 11BB2	𑌏 11BC2	𑌐 11BD2	𑌑 11BE2
3	𑌒 11B93	𑌓 11BA3	𑌔 11BB3	𑌕 11BC3	𑌖 11BD3	𑌗 11BE3
4	𑌘 11B94	𑌙 11BA4	𑌚 11BB4	𑌛 11BC4		𑌜 11BE4
5	𑌝 11B95	𑌞 11BA5	𑌟 11BB5	𑌠 11BC5		𑌡 11BE5
6	𑌢 11B96	𑌣 11BA6	𑌤 11BB6	𑌥 11BC6		𑌦 11BE6
7	𑌧 11B97	𑌨 11BA7	𑌩 11BB7	𑌪 11BC7		𑌫 11BE7
8		𑌬 11BA8	𑌭 11BB8			𑌮 11BE8
9		𑌯 11BA9	𑌰 11BB9			𑌱 11BE9
A	𑌳 11B9A	𑌴 11BAA	𑌵 11BBA	𑌶 11BCA		
B	𑌷 11B9B	𑌸 11BAB	𑌹 11BBB	𑌺 11BCB		
C	𑌼 11B9C	𑌽 11BAC	𑌾 11BBC	𑌿 11BCC		
D	𑍀 11B9D	𑍁 11BAD	𑍂 11BBD	𑍃 11BCD		
E	𑍅 11B9E	𑍆 11BAE	𑍇 11BBE	𑍈 11BCE		
F	𑍊 11B9F	𑍋 11BAF	𑍌 11BBF	𑍍 11BCF		

Independent vowels

11B90	𑌀	NANDINAGARI LETTER A
11B91	𑌁	NANDINAGARI LETTER AA
11B92	𑌂	NANDINAGARI LETTER I
11B93	𑌃	NANDINAGARI LETTER II
11B94	𑌄	NANDINAGARI LETTER U
11B95	𑌅	NANDINAGARI LETTER UU
11B96	𑌆	NANDINAGARI LETTER VOCALIC R
11B97	𑌇	NANDINAGARI LETTER VOCALIC RR
11B98	𑌈	<reserved>
11B99	𑌉	<reserved>
11B9A	𑌊	NANDINAGARI LETTER E
11B9B	𑌋	NANDINAGARI LETTER AI
11B9C	𑌌	NANDINAGARI LETTER O
11B9D	𑌍	NANDINAGARI LETTER AU

Consonants

11B9E	𑌎	NANDINAGARI LETTER KA
11B9F	𑌏	NANDINAGARI LETTER KHA
11BA0	𑌐	NANDINAGARI LETTER GA
11BA1	𑌑	NANDINAGARI LETTER GHA
11BA2	𑌒	NANDINAGARI LETTER NGA
11BA3	𑌓	NANDINAGARI LETTER CA
11BA4	𑌔	NANDINAGARI LETTER CHA
11BA5	𑌕	NANDINAGARI LETTER JA
11BA6	𑌖	NANDINAGARI LETTER JHA
11BA7	𑌗	NANDINAGARI LETTER NYA
11BA8	𑌘	NANDINAGARI LETTER TTA
11BA9	𑌙	NANDINAGARI LETTER TTHA
11BAA	𑌚	NANDINAGARI LETTER DDA
11BAB	𑌛	NANDINAGARI LETTER DDHA
11BAC	𑌜	NANDINAGARI LETTER NNA
11BAD	𑌝	NANDINAGARI LETTER TA
11BAE	𑌞	NANDINAGARI LETTER THA
11BAF	𑌟	NANDINAGARI LETTER DA
11BB0	𑌠	NANDINAGARI LETTER DHA
11BB1	𑌡	NANDINAGARI LETTER NA
11BB2	𑌢	NANDINAGARI LETTER PA
11BB3	𑌣	NANDINAGARI LETTER PHA
11BB4	𑌤	NANDINAGARI LETTER BA
11BB5	𑌥	NANDINAGARI LETTER BHA
11BB6	𑌦	NANDINAGARI LETTER MA
11BB7	𑌧	NANDINAGARI LETTER YA
11BB8	𑌨	NANDINAGARI LETTER RA
11BB9	𑌩	NANDINAGARI LETTER LA
11BBA	𑌪	NANDINAGARI LETTER VA
11BBB	𑌫	NANDINAGARI LETTER SHA
11BBC	𑌬	NANDINAGARI LETTER SSA
11BBD	𑌭	NANDINAGARI LETTER SA
11BBE	𑌮	NANDINAGARI LETTER HA
11BBF	𑌯	NANDINAGARI LETTER LLA
11BC0	𑌰	NANDINAGARI LETTER RRA

Dependent vowel signs

11BC1	𑌱	NANDINAGARI VOWEL SIGN AA
11BC2	𑌲	NANDINAGARI VOWEL SIGN I
11BC3	𑌳	NANDINAGARI VOWEL SIGN II
11BC4	𑌴	NANDINAGARI VOWEL SIGN U
11BC5	𑌵	NANDINAGARI VOWEL SIGN UU
11BC6	𑌶	NANDINAGARI VOWEL SIGN VOCALIC R
11BC7	𑌷	NANDINAGARI VOWEL SIGN VOCALIC RR
11BC8	𑌸	<reserved>
11BC9	𑌹	<reserved>
11BCA	𑌺	NANDINAGARI VOWEL SIGN E
11BCB	𑌻	NANDINAGARI VOWEL SIGN AI
11BCC	𑌼	NANDINAGARI VOWEL SIGN O
11BCD	𑌽	NANDINAGARI VOWEL SIGN AU

Various signs

11BCE	𑌾	NANDINAGARI SIGN ANUSVARA
11BCF	𑌿	NANDINAGARI SIGN VISARGA
11BD0	𑍀	NANDINAGARI SIGN VIRAMA

Additional signs

11BD1	𑍁	NANDINAGARI SIGN AVAGRAHA
-------	---	---------------------------

Invocation sign

11BD2	𑍂	NANDINAGARI SIGN SIDDHAM
-------	---	--------------------------

Punctuation

11BD3	𑍃	NANDINAGARI HEADSTROKE • used as a spacing or filler mark
-------	---	--

Digits

11BE0	𑍄	NANDINAGARI DIGIT ZERO
11BE1	𑍅	NANDINAGARI DIGIT ONE
11BE2	𑍆	NANDINAGARI DIGIT TWO
11BE3	𑍇	NANDINAGARI DIGIT THREE
11BE4	𑍈	NANDINAGARI DIGIT FOUR
11BE5	𑍉	NANDINAGARI DIGIT FIVE
11BE6	𑍊	NANDINAGARI DIGIT SIX
11BE7	𑍋	NANDINAGARI DIGIT SEVEN
11BE8	𑍌	NANDINAGARI DIGIT EIGHT
11BE9	𑍍	NANDINAGARI DIGIT NINE

Nandinagari Devanagari			Nandinagari Devanagari		
KA	क	क	DHA	३	ध
KHA	ख	ख	NA	न	न
GA	ग	ग	PA	प	प
GHA	घ	घ	PHA	फ	फ
NGA	ङ	ङ	BA	ब	ब
CA	च	च	BHA	भ	भ
CHA	छ	छ	MA	म	म
JA	ज	ज	YA	य	य
JHA	झ	झ	RA	र	र
NYA	ञ	ञ	LA	ल	ल
TTA	ट	ट	VA	व	व
TTHA	ठ	ठ	SHA	श	श
DDA	ड	ड	SSA	ष	ष
DDHA	ढ	ढ	SA	स	स
NNA	ण	ण	HA	ह	ह
TA	त	त	LLA	ळ	ळ
THA	थ	थ	RRA	ॠ	ॠ
DA	द	द			

Table 1: Comparison of basic letters and signs of Nandinagari and Devanagari.

	Nandinagari	Devanagari		Nandinagari	Devanagari
A	अ	अ	Inherent vowel		
AA	आ	आ	SIGN AA	ा	ा
I	इ	इ	SIGN I	ि	ि
II	ई	ई	SIGN II	ी	ी
U	उ	उ	SIGN U	ु	ु
UU	ऊ	ऊ	SIGN UU	ू	ू
VOCALIC R	ऋ	ऋ	SIGN VOCALIC R	ृ	ृ
VOCALIC RR	ॠ	ॠ	SIGN VOCALIC RR	ॡ	ॡ
E	ए	ए	SIGN E	े	े
AI	ऐ	ऐ	SIGN AI	ै	ै
O	ओ	ओ	SIGN O	ो	ो
AU	औ	औ	SIGN AU	ौ	ौ

Table 2: Comparison of basic letters and signs of Nandinagari and Devanagari.

	Nandinagari	Devanagari
ANUSVARA	◌ं	◌ं
VISARGA	◌ः	◌ः
VIRAMA	◌्	◌्
AVAGRAHA	◌ः	◌ः

Table 3: Comparison of various signs of Nandinagari and Devanagari.

	Nandinagari	Kannada	Devanagari
ZERO	೦	೦	०
ONE	೧	೧	१
TWO	೨	೨	२
THREE	೩	೩	३
FOUR	೪	೪	४
FIVE	೫	೫	५
SIX	೬	೬	६
SEVEN	೭	೭	७
EIGHT	೮	೮	८
NINE	೯	೯	९

Table 4: Comparison of digits of Nandinagari, Kannada, and Devanagari.

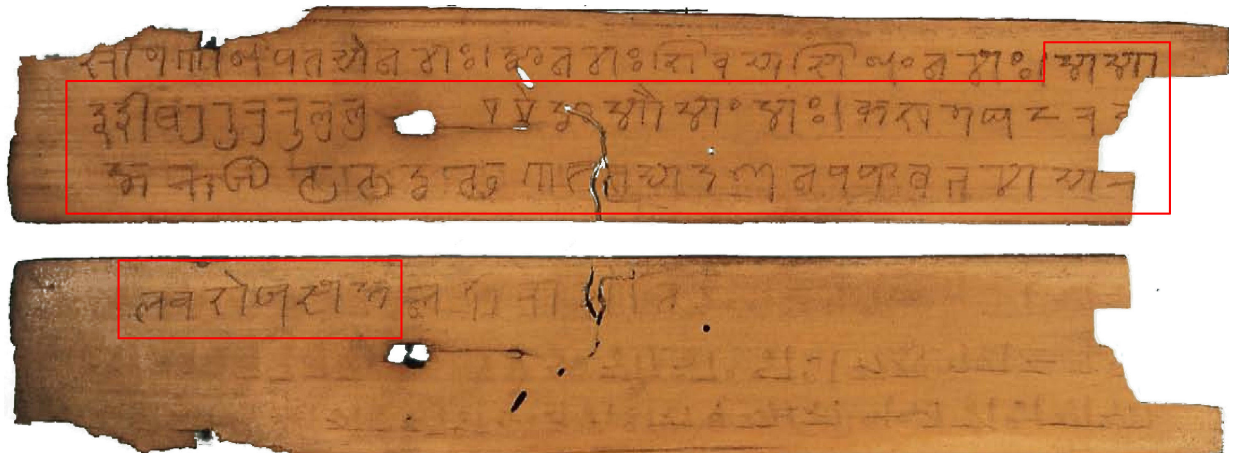


Figure 1: Nandinagari character inventory in a manuscript. Note the representation of the vocalic letters r , $\bar{r}$, $\bar{l}$, $\bar{\bar{l}}$ using RA and LA combined with U VOWEL SIGN U . The letter NGA is shown without the $\circ$ *bindu*. The letter CHA and half of RA is missing because the folio is damaged.

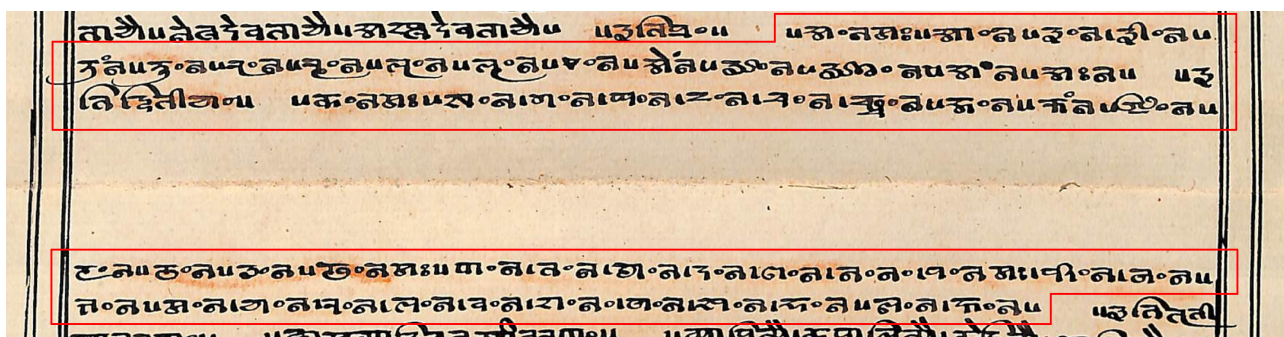


Figure 2: Nandinagari character inventory in a manuscript.

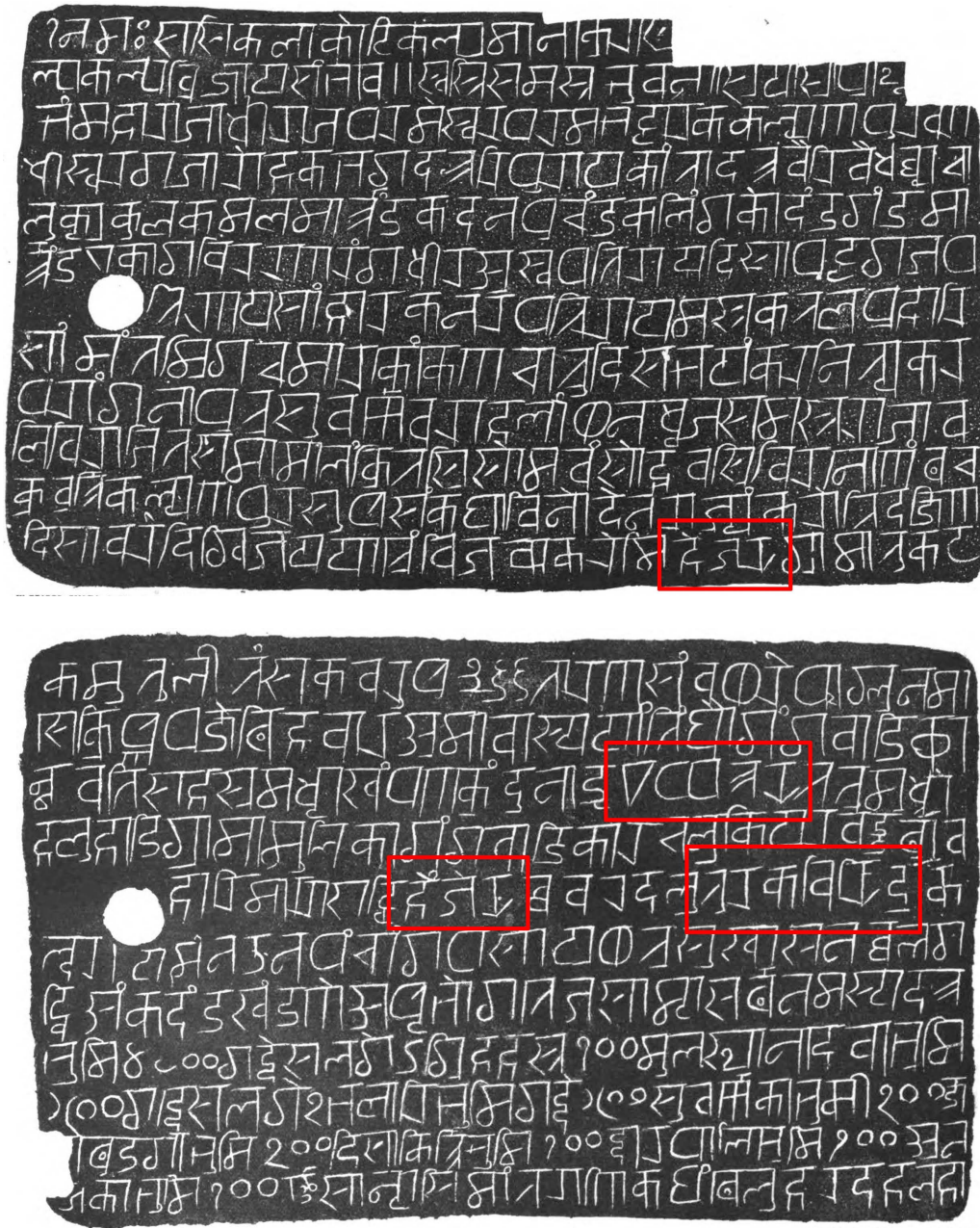


Figure 3: Copper plate of Vīraṇaṇṁba bearing a grant inscribed in Nandinagari, Saka 366 (from Rice 1879, plates 1, 2). The letter 𑌕 RA occurs in the name of the village Henjara (*heṃjara-grāmā*) and in the phrases *eppattara* and *turakaviridu*.

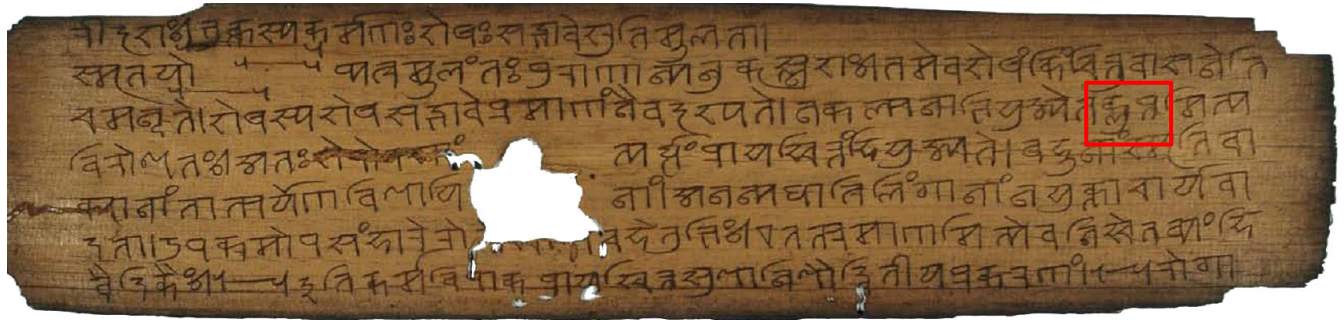
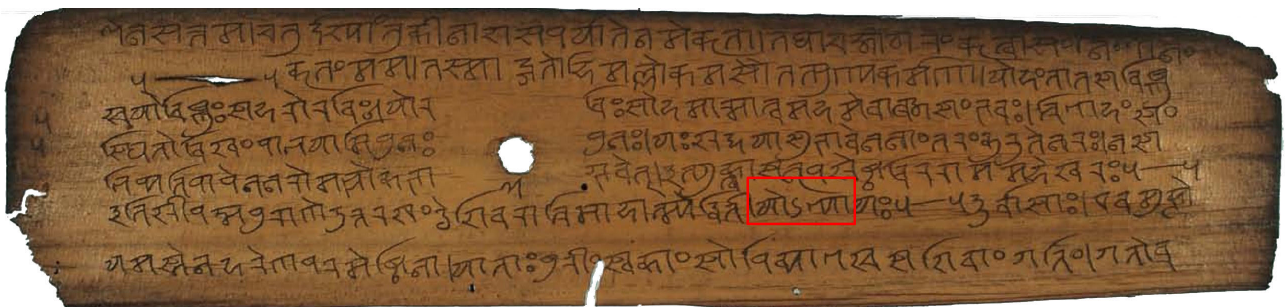
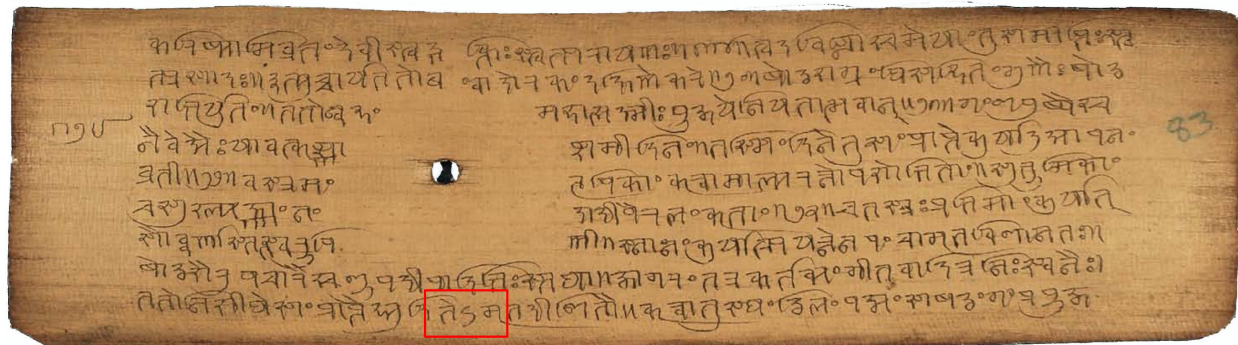
Figure 4: Occurrence of *l* in the word *kṛpta*.

Figure 5: Nandinagari folios showing usage of S NANDINAGARI SIGN AVAGRAHA.

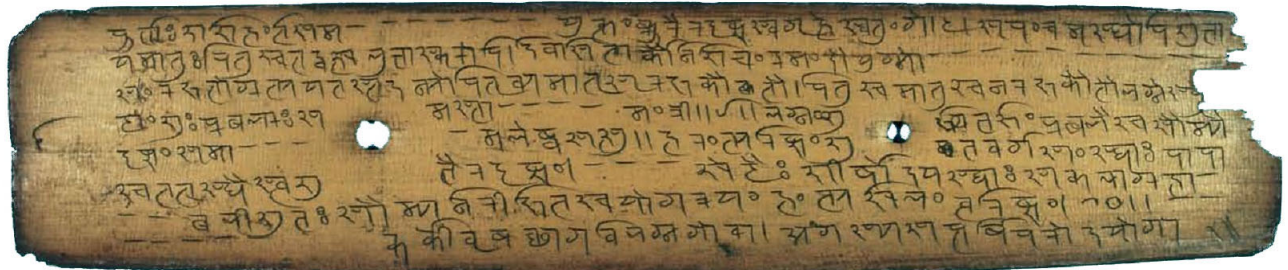
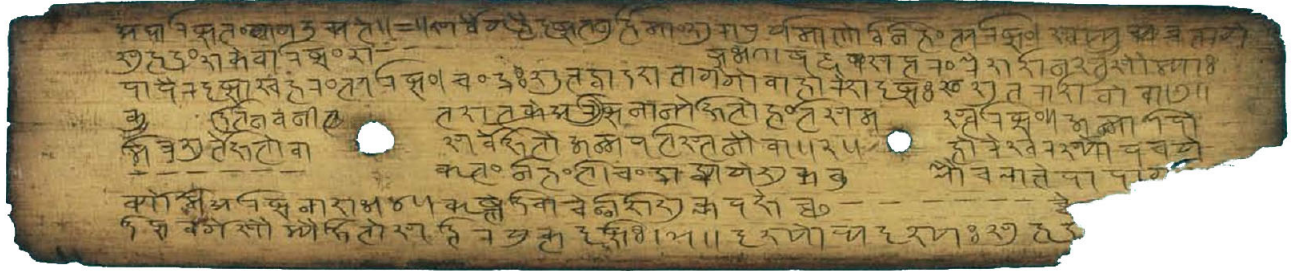


Figure 6: Usage of the $\neg$ NANDINAGARI HEADSTROKE (from *Jyotisham Vastulakshanam*, IFP no. RE33587).

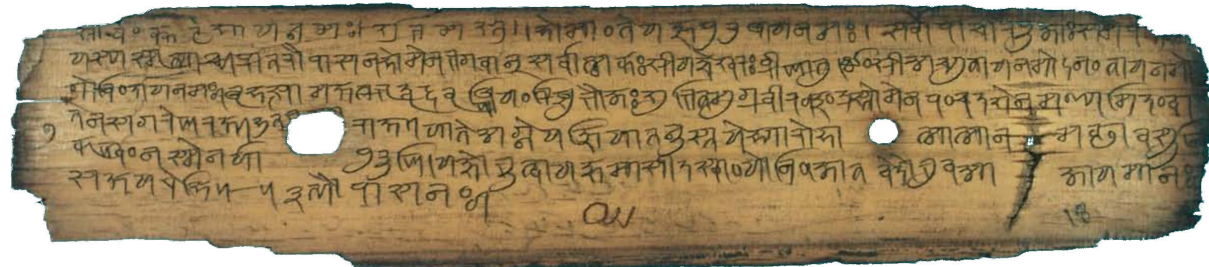
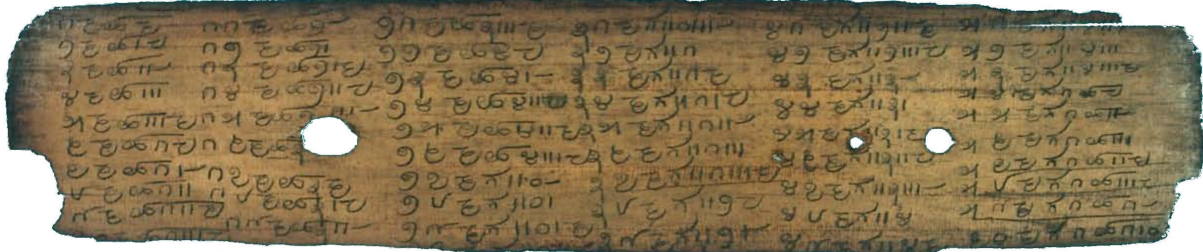
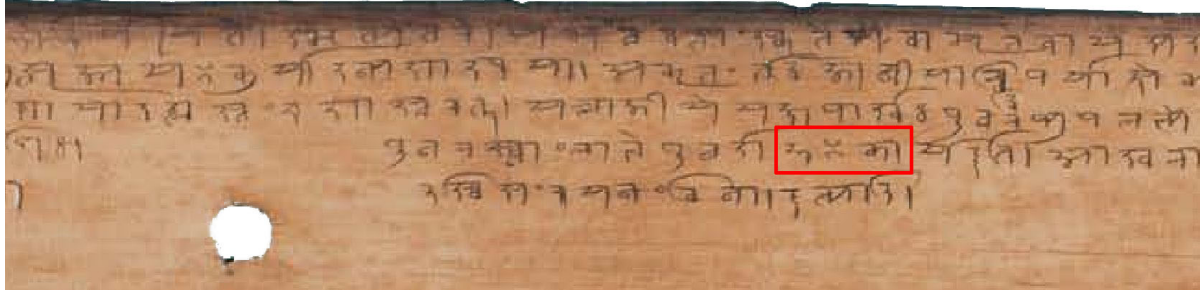
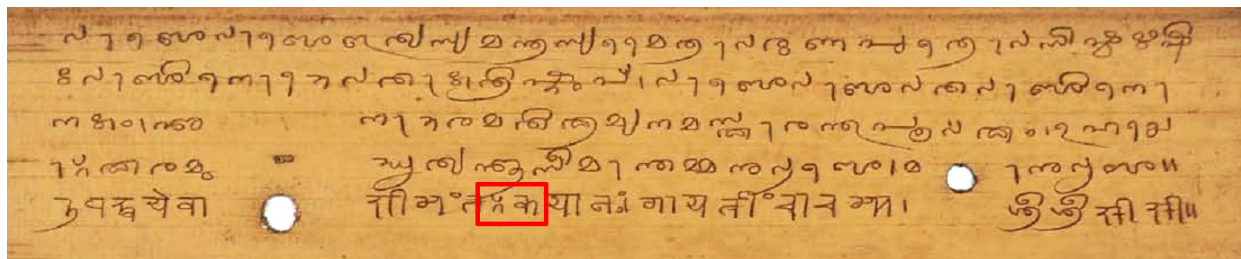
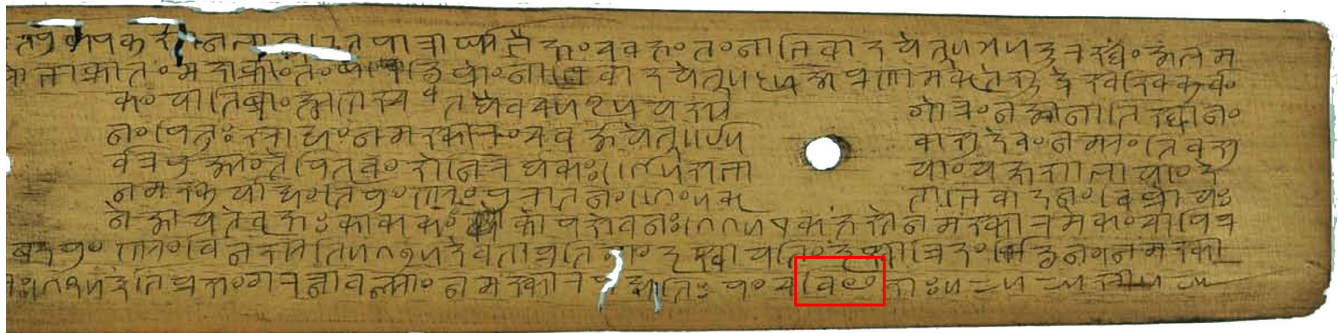
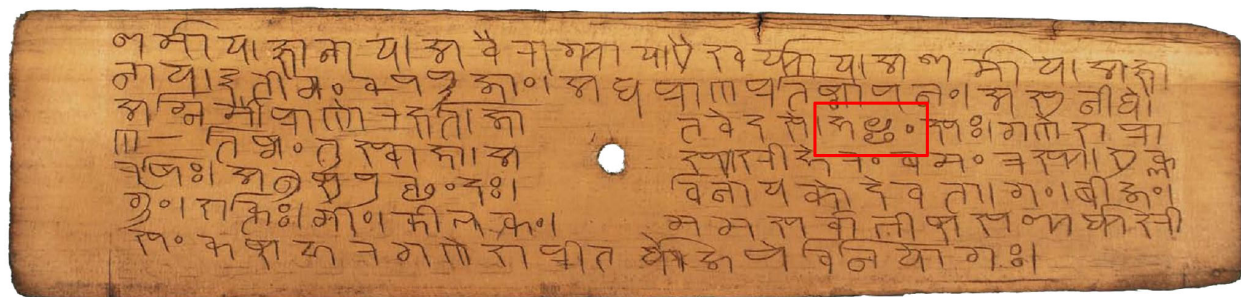


Figure 7: Usage of fraction signs in Nandinagari (from *Jyotisham Vastulakshanam*, IFP no. RE33587).

Figure 8: Usage of *jivhāmūlīya* in Nandinagari.Figure 9: Usage of *jivhāmūlīya* in Nandinagari.

Figure 10: Usage of Vedic *anusvāra* in Nandinagari.Figure 11: Usage of double *anusvāra* in Nandinagari.

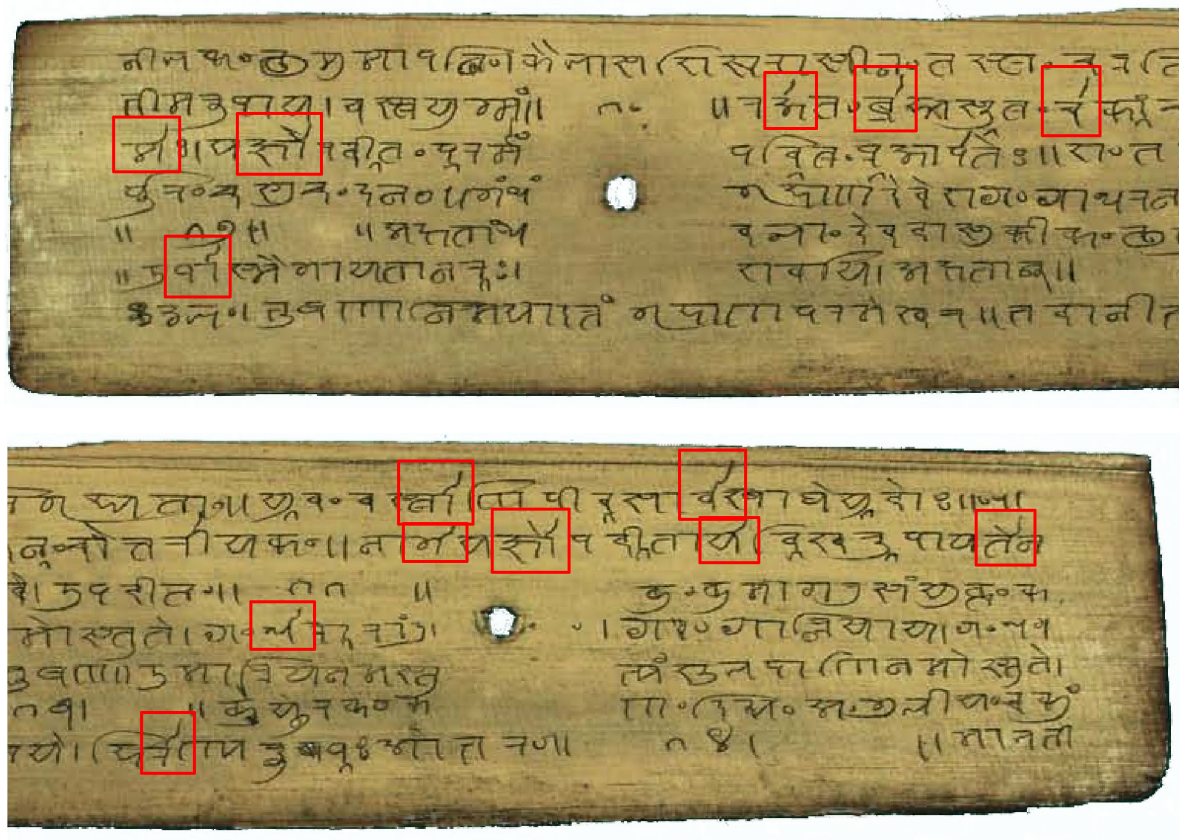
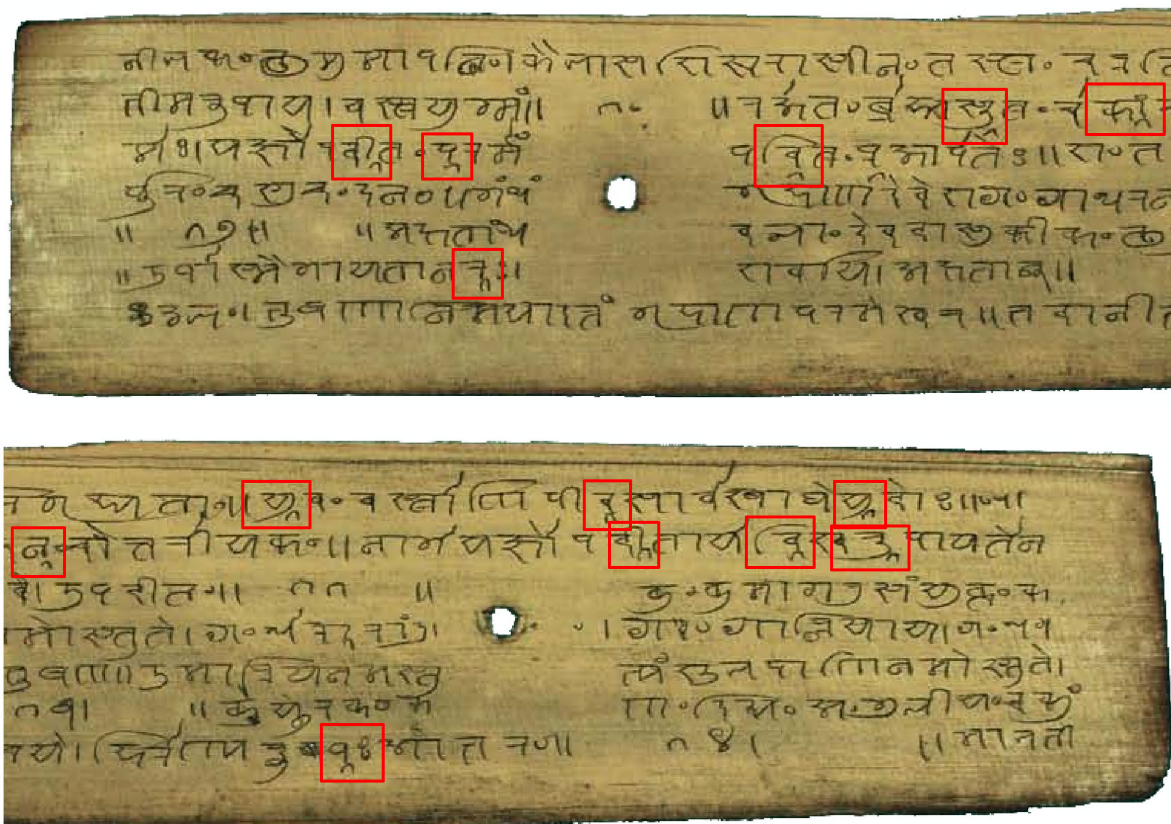


Figure 12: Usage of the Vedic intonation sign ○, *svarita* in Nandinagari.

Figure 13: Usage of the Vedic intonation sign ॐ *anudatta* in Nandinagari.

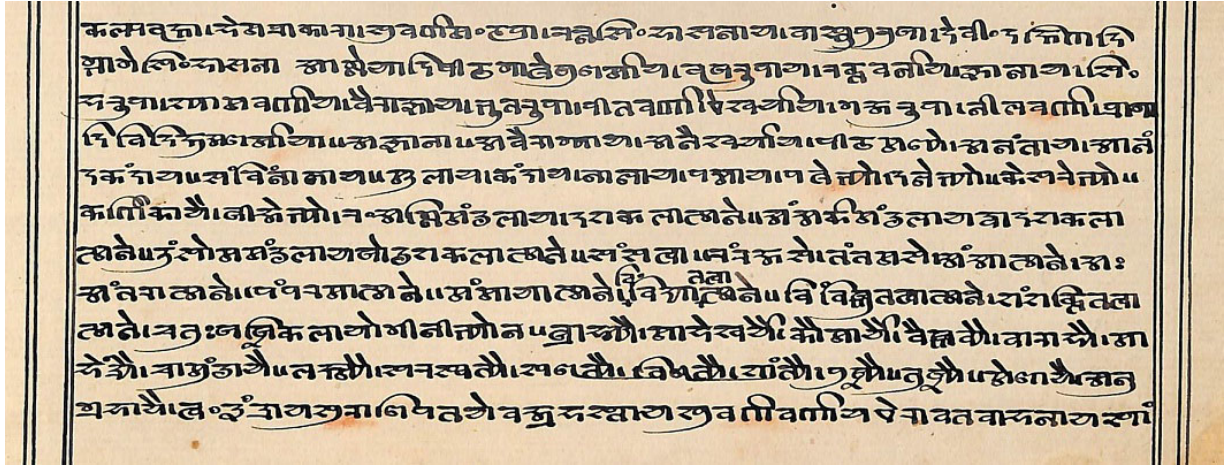


Figure 14: Example of a style of Nandinagari written in ink, which differs from the style used on palm leaves, as shown in the preceding figures.



Figure 15: A coin of Krishnadevaraya, the emperor of Vijayanagara (r. 1509–1530), with the inscription “*srīkṛṣṇarāya*” in Nandinagari on the obverse.

The Krāku Grant of Harihara II - Plate XXXV

Śaka 1298 (A.D.1376/1377)

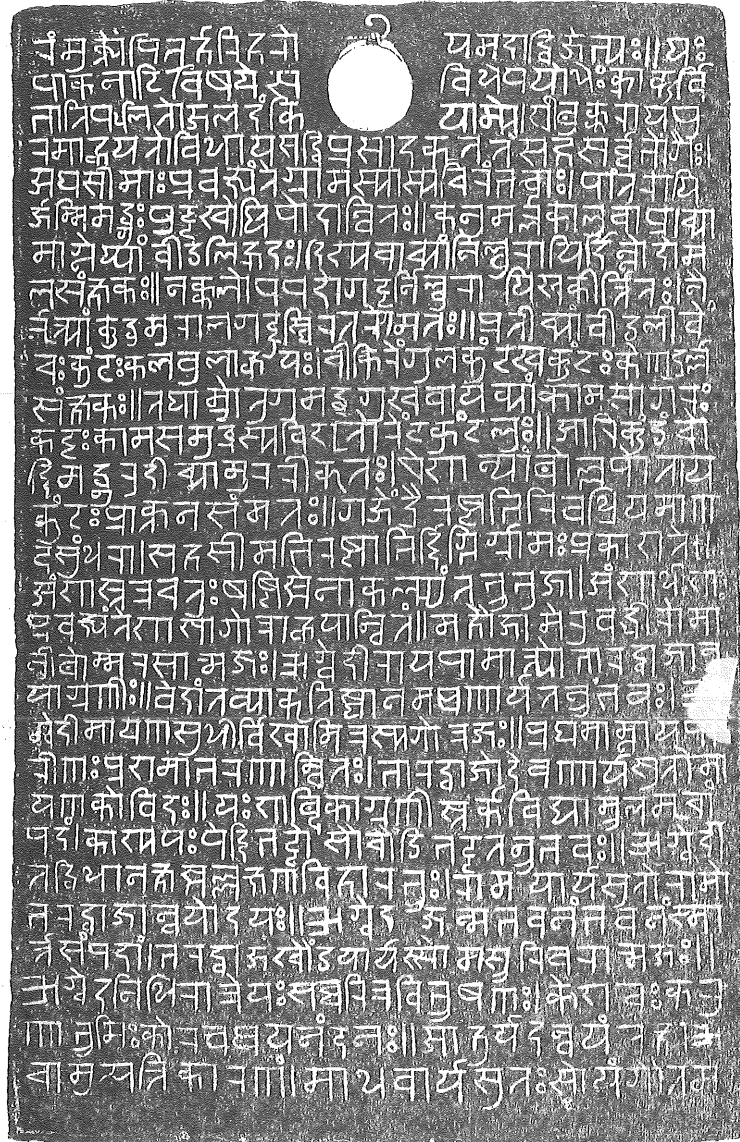


Figure 16: A plate containing a record in Nandinagari (from Visalakshy 2003: 266).

Nandinagari script नन्दिनागरी नन्दिनागरी लिपि

Vowels स्वराः स्वराः

अ	आ	इ	ई	उ	ऊ
a अ	ā आ	i इ	ī ई	u उ	ū ऊ
ऋ	ॠ	ए	ऐ	ओ	औ
r ऋ	r̄ ॠ	e ए	ai ऐ	o ओ	au औ

Consonants व्यन्जनानि व्यञ्जनानि

क	ख	ग	घ	ङ
ka क	kha ख	ga ग	gha घ	ṅa ङ
च	छ	ज	झ	ञ
ca च	cha छ	ja ज	jha झ	ña ञ
ट	ठ	ड	ढ	ण
ṭa ट	ṭha ठ	ḍa ड	ḍha ढ	ṇa ण
त	थ	द	ध	न
ta त	tha थ	da द	dha ध	na न
प	फ	ब	भ	म
pa प	pha फ	ba ब	bha भ	ma म
य	र	ल	व	श
ya य	ra र	la ल	va व	śa श
ष	स	ह	ळ	र
ṣa ष	sa स	ha ह	ḷa ळ	ra र

Figure 17: Handwritten chart of Nandinagari characters (courtesy of Srinidhi A., Tumkur, Karnataka).

Vowel signs

क का कि की कु कु क् क् के कै को को
ka k̄a ki k̄i ku k̄u kṛ kṝ ke kai ko kau

Various signs

Anusvara- ँ Visarga- ः Ardhavisarga- ऌ

Avagraha- ः Vedic Anusvaras- ऌ, ऍ

Virama- ः

क-क, ग-ग, त-त, न-न, त-त

Digits (Kannada digits)

० १ २ ३ ४ ५ ६ ७ ८ ९

0 1 2 3 4 5 6 7 8 9

Variants

अ - अ, अ

इ - इ

उ - उ

ऋ - ऋ

ॠ - ॠ

ऌ - ऌ

ॡ - ॡ

ॢ - ॢ, ॣ

। - ।, ॥

व - व, व

म - म

ष - ष, ष

स - स, स

॥ - ॥

॥ - ॥

॥ - ॥

॥ - ॥

॥ - ॥

Figure 18: Handwritten chart of Nandinagari characters (courtesy of Srinidhi A., Tumkur, Karnataka).

Consonant conjuncts in Nandinagari script

<u>K-</u>							
Kka	क, कः		Knya	क्य		kṣva	क्ष
Kkra	कः		kpa	कप		kṣa	क्षः, कश्च
Kkla	कः		kpra	कप्प		kṣta	कश्च
Kkva	कः		kpla	कप्ल		kṣtra	कश्च
Kkha	कश्च		kpha	कफ		kṣtha	कश्च
Kca	क		kma	कम		kṣna	कश्च
Kcha	कः		kmya	कम्य		kṣpa	कश्च
Kta	क		kya	क		kṣpha	कश्च
Kṭa	कट		kra	क		kṣma	कश्च
Kṇa	कः		kṛya	कः		kṣya	कश्च
Kṭa	कः, कः		kṛla	कः		kṣra	कश्च
Kṭya	कः		kṛya	कः		kṣva	कश्च
Ktra	कः		kva	क, कः		<u>kh-</u>	
Kṭya	कः		kṣa	कः		khkha	क्ष
Kṭya	कः		kṣa	कः		khna	क्ष
Kṭya	कः		kṣna	कः		khyā	क्ष
Kṭya	कः		kṣna	कः		khva	क्ष
Kṭya	कः		kṣna	कः		<u>ḡ-</u>	
Kṭya	कः		kṣna	कः		ḡga	ग, गः
Kṭya	कः		kṣna	कः		ḡga	ग
Kṭya	कः		kṣna	कः		ḡgha	ग
Kṭya	कः		kṣna	कः		ḡghya	ग
Kṭya	कः		kṣna	कः			

Figure 19: Handwritten table of Nandinagari conjuncts (courtesy of Srinidhi A., Tumkur, Karnataka).

gghra	गघ		grya	गय		c-	
gja	गज		grva	गव		cca	व
gja	गज		gla	गल		cca	व
gja	गज		gva	गव		ccha	व
gda	गद		guya	गय		cchya	व
gda	गद		gura	गु		cchra	व
gdya	गद					cchla	व
gdra	गद		gh-			cchva	व
gdva	गद		ghgha	गघ		cma	व
gdvya	गद		ghra	ग		cna	व
gdha	गद		ghnya	ग		cya	व
gdhra	गद		ghma	ग		cra	व
gdhya	गद		ghya	ग		cva	व
gdhva	गद		ghra	ग			
gna	गन		ghrya	ग		j-	
gnya	गन		ghva	ग		ija	ग, ग
gba	गब		ghvya	ग			
gbha	गब		i-			ija	ग
gbhya	गब		rita	र		ija	ग
gbhra	गब		rina	र		iva	ग
gma	गम		riya	र		ija	ग
gmya	गम		rma	र, म, म		ina	ग
gya	ग		nva	व			
gra	ग						

Figure 20: Handwritten table of Nandinagari conjuncts (courtesy of Srinidhi A., Tumkur, Karnataka).

ṣṇya	ṣṇ	tṭra	ṭṭ, ṭṭ	ḍṇa	ḍṇ
ṣṇva	ṣṇṃ	tṭva	ṭṭṃ	ḍṇya	ḍṇṃ
jma	ṣṇ	tṭpa	ṭṭṃ	ḍḍa	ḍḍ
jmya	ṣṇṃ	tṭpra	ṭṭṃ	ḍḍha	ḍḍṃ
jya	ṣṇ	tṭpha	ṭṭṃ	ḍḍhya	ḍḍṃṃ
jva	ṣṇṃ	tṭma	ṭṭṃ	ḍḍhva	ḍḍṃṃṃ
jmya	ṣṇṃ	tṭya	ṭṭṃ	ḍḍa	ḍḍ
jva	ṣṇṃ	tra	ṭṭ	ḍḍva	ḍḍṃ
jmya	ṣṇṃ	tva	ṭṭṃ	ḍḍba	ḍḍṃṃ
t-		tṣa	ṭṭṃ	ḍḍbha	ḍḍṃṃṃ
tka	ṭṭ, ṭṭṃ	tṣa	ṭṭṃ	ḍḍhya	ḍḍṃṃṃ
tkra	ṭṭṃ	tṣva	ṭṭṃṃ	ḍma	ḍṃ
tca	ṭṭ	ṭh-		ḍya	ḍṃ
tcha	ṭṭṃ	ṭhya	ṭṭṃ	ḍra	ḍṃṃ
tṭa	ṭṭ, ṭṭṃ	ḍ-		ḍla	ḍṃṃṃ
tṭa	ṭṭṃ	ḍḍ	ḍṃṃṃ	ḍva	ḍṃṃṃṃ
tṭa	ṭṭṃ	ḍḍya	ḍṃṃṃṃ	ḍhya	ḍṃṃṃṃṃ
tṭa	ṭṭṃ	ḍḍra	ḍṃṃṃṃ	ḍh-	
tṭa	ṭṭṃ	ḍḍha	ḍṃṃṃṃ	ḍhya	ṭṭṃ
tṭa	ṭṭṃ	ḍḍia	ḍṃṃṃṃ	ḍhra	ṭṭṃ

Figure 21: Handwritten table of Nandinagari conjuncts (courtesy of Srinidhi A., Tumkur, Karnataka).

dhva	द्व	ttma	तम	trva	त्र
n-		ttya	तम	tva	त्व,
nna	म	ttra	त्रे	tvya	व्य
nna	म	ttrya	त्र्य	tsta	स्त
nma	म,	ttva	त्र	taka	त्क
nya	म	ttsa	स्त	tskha	त्ख
nva	म	ttha	थ	tsta	स्त
nvya	म	tthya	थ्य	tstra	स्त्र
t-		tta	त्र	tstha	स्थ
tka	क	tnya	त्र्य	tsthya	स्थ्य
tkya	क्य	tnva	त्र	tsna	स्न
tkva	क्य	tpa	त	tspa	स्प
tkla	क्ल	tpa	त	tspra	स्प
tkla	क्ल	tpa	त	tspha	स्फ
tksa	क	tpa	त	tsphya	स्फ्य
tkma	कम	tma	तम	tisma	स्म
tkva	कव	tmya	त्र्य	tsya	स्य
tkha	त्ख,	tya	त	tsra	स्त्र
tkhya	त्ख्य	tyva	त्र्य	tsa	स्व
tta	त्र	tra	त्र	th-	
ttna	त्र	trya	त्र्य	thna	थ
				thya	थ्य

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thra	𑌔	dna	𑌔	dhya	𑌔
thva	𑌕	dba	𑌕	dhra	𑌕
d-		dbra	𑌖	dhrya	𑌖
dga	𑌗	dbha	𑌗	dhva	𑌗
dgra	𑌘	dbhya	𑌘	dhrya	𑌘
dglā	𑌙	dbhra	𑌙	dhvra	𑌙
dghē	𑌚	dhva	𑌚	n-	
dghra	𑌛	dma	𑌛	nka	𑌛
dghra	𑌜	dmga	𑌜	nkra	𑌜
dda	𑌝	dya	𑌝	nkla	𑌝
ddya	𑌞	dra	𑌞	nkva	𑌞
ddra	𑌟	drya	𑌟	nkṣa	𑌟
ddva	𑌠	drva	𑌠	nkha	𑌠
ddha	𑌡	dva	𑌡	nknya	𑌡
	𑌢	dvya	𑌢	nga	𑌢
	𑌣	dvra	𑌣	ngha	𑌣
	𑌤	dh-		nna	𑌤
ddhma	𑌥	dhra	𑌥	nnya	𑌥
ddhya	𑌦	dhda	𑌦	nnva	𑌦
ddhae	𑌧	dhnya	𑌧	npa	𑌧
ddhva	𑌨	dhma	𑌨	npa	𑌧

Figure 23: Handwritten table of Nandinagari conjuncts (courtesy of Srinidhi A., Tumkur, Karnataka).

npla	नप्ल		nsna	नसना		pma	पमा
npsa	नपसा		nspa	नस्प		pya	पय
npha	नपहि		nsma	नसम		pra	प्र
nba	नब		nsya	नस्य		prya	प्रय
nbra	नब्र		nsra	नस्र		pla	प्ल
nbha	नभ		nsva	नस्व		pva	पव
nbhra	नभ्र		nha	नह		pśa	पश
nma	नम		p-			psa	पस
nmya	नम्य		pka	पक		psna	पसन
nmra	नम्र		pca	पच		psnya	पस्यन
nmla	नम्ल		pccha	पच्छ		psya	पस्य
nya	नय		pta	पत		psva	पस्व
nyva	नयव		pna	पन		b-	
nra	नर		pta	पत, पत्		bga	बग
nva	नव		ptya	पय		bgra	बग्र
nvya	नव्य		ptva	पतव		bja	बज
nvra	नवर		ptrya	पत्रय			क
nśa	नश		ptva	पतव		bija	बिज
nsa	नस		pna	पन		bda	बद
nska	नस्क		pnya	पन्य		bdya	बदय
nsta	नस्त		ppa	पप		bdhva	बद्व
nstha	नस्थ		ppra	पप्र		bdhya	बद्व
	नस्य		p-ph	पपि			

Figure 24: Handwritten table of Nandinagari conjuncts (courtesy of Srinidhi A., Tumkur, Karnataka).

bdhva	बध्व	bhva	भ्व	l-	ल
bba	बब,	bhva	भ्व	lKa	लक
	बव			dkya	दक्य
bbra	बुब	m-	म	ilga	इलग,
bbha	बुभ	mna	मन	lgva	लगव
bbhya	बुभ्य	mna	मन	lgva	लगव
bya	ब्य	mnya	मन्य	lgvya	लगव्य
bba	बु	mna	मन	lpa	लप
bla	बु	mmya	मम्य	lpya	लप्य
bva	बुव	mmra	मम	lba	लब
buya	बुव्य	mmk	मम	lbha	लभ
bh-		mya	म	lra	लर
bhma	भम	mra	म	lma	लम
bhna	भन	mrya	मन्य	lya	लय
bhya	भ्य	mra	म	lla	लल
bha	भ	mva	मव	llya	लल्य
bhya	भ्य	mha	मह	lva	लव
bha	भ	y-	य	lvya	लव्य
bhya	भ्य	yya	य्य	lha	लह
bhya	भ्य	yva	यव	v-	व
bhya	भ्य	r-	र	vna	व
bhya	भ्य	reph	रि	vnya	व
bhya	भ्य	rka	रि		

Figure 25: Handwritten table of Nandinagari conjuncts (courtesy of Srinidhi A., Tumkur, Karnataka).

vya	वा	ṣ-	ष	ṣra	ष	ṣṣa	षष
vra	व्र	ṣka	ष्क	ṣva	व्ष	ṣṣya	षष्य
vla	व्ल	ṣkya	षक्य	ṣ-	सक	ṣṣva	षष्व
wa	वु, वव	ṣkra	षक्र	ska	स्क	h-	
ṣ-		ṣkla	षक्ल	sta	स्त	hṇa	ह्न
ṣca	श्च	ṣkva	षक्व	stma	स्म	nna	न्न
ṣcya	श्च्य	ṣta	ष्ट	stya	स्त्य	hṇya	ह्न्य
ṣcha	श्चु	ṣtya	ष्त्य	stṛa	स्त्र	hṇa	ह्न
ṣna	श्न	ṣtra	ष्त्र	stṛya	स्त्र्य	hṇya	ह्न्य
ṣnya	श्न्य	ṣtrya	ष्त्र्य	stva	स्त्व	hya	ह्य
ṣpa	श्प	ṣtrya	ष्त्र्य	stha	स्थ	hra	ह्र
ṣma	श्म	stva	स्त्व	sthna	स्थ्न	hla	ह्ल
ṣmya	श्म्य	ṣna	ष्न	sthya	स्थ्य	hva	ह्व
ṣya	श्य	ṣnya	ष्न्य	sthya	स्थ्य	hṇya	ह्न्य
ṣra	श्न	ṣṇa	ष्ण	ṣna	स्न	l-	
ṣrya	श्न्य	ṣṇva	ष्ण्व	ṣnya	स्न्य	ḷga	ग्ल
ṣrva	श्न्र	ṣpa	षप	spa	स्प	ḷya	ग्ल्य
ṣla	श्ल	ṣpya	षप्य	spra	स्पृ	ḷka	ग्लक
ṣva	श्व	ṣpra	षप्र	spha	स्फ	ḷla	ग्लल
ṣvya	श्व्य	ṣpla	षप्ल	sphya	स्फ्य		
ṣṣa	श्श	ṣpva	षप्व	sma	स्म		
		ṣpha	षफ	ṣmya	स्म्य		
		ṣma	षम	ṣya	श्य		
		ṣmya	षम्य	ṣra	श्न		
		ṣya	ष्य	ṣva	श्व		
				ṣvya	श्व्य		

Figure 26: Handwritten table of Nandinagari conjuncts (courtesy of Srinidhi A., Tumkur, Karnataka).

CHAPTER II

ALPHABETS AND NUMERALS

Nandināgarī has twelve vowel letters and thirty five consonant letters. The number excludes 'a' with anusvāra and 'a' with visarga. In the inventory of Nandināgarī alphabets 'kṣa' and 'jña' are treated as single letters. In the case of the letter for 'kṣa' it does not show any apparent resemblance with the letters of ka and ṣa. However, in the case of 'jña' it has some resemblance with the letter ja. The letter for 'ba' is very often used to represent 'va' and the letter for 'sa' is commonly used to represent 'śa'. Since a few instances are noticed where sa-ṣa and ba - va are distinguished by separate letters, all the four are included in the inventory of letters.

VOWELS

There exists only four basic vowel letters. The other letters representing vowels are only derivations. These four primary vowel letters are those which represent a, i, u and e. The long vowels ā, ī, and ū are derived by the use of subsidiary symbols. The vowels ṛ and ṝ are derived from the consonant letters 'ra' and 'la'. The letters for long vowels ȳ and ȳ̄ are absent. The dipthong 'ai' is formed by the use of subsidiary symbol with the letter for the vowel 'e', the letters for 'o' and 'au' are formed by adding subsidiary symbols to the letter 'ā'. The vowels of Nandināgarī script are given below.

NANDINĀGARĪ	ROMAN	DEVANĀGARĪ
अ	A	अ
आ	Ā	आ
इ	I	इ

NANDINĀGARĪ	ROMAN	DEVANĀGARĪ
ओ	O	ओ
औ	AU	औ

CONSONANTS

The basic consonant letters of Nandināgarī, similar to that of other Indian scripts, indicate the consonant + the vowel 'a'. As in Devanāgarī, letters are found for all the varga consonants. When a pure consonant i.e. without any vowel is to be represented, a separate subsidiary symbol which is identical with the symbol in the Devanāgarī script is found to be in use. Eg. (k), (c), (t). The consonant letters are as follows:

NANDINĀGARĪ	ROMAN	DEVANĀGARĪ
क	KA	क
ख	KHA	ख
ग	GA	ग

NANDINĀGARĪ	ROMAN	DEVANĀGARĪ
ई	Ī	ई
उ	U	उ
ऊ	Ū	ऊ
ऋ	Ṛ	ऋ
ॠ	Ṝ	ॠ
ए	E	ए
ऐ	AI	ऐ

NANDINĀGARĪ	ROMAN	DEVANĀGARĪ
घ	GHA	घ
ङ	ṆA	ङ
च	CA	च
छ	CHA	छ
ज	JA	ज
झ	JHA	झ
ञ	ṆA	ञ

Figure 27: Charts showing basic characters of Nandinagari (from Visalakshy 2003: 20–23).

NANDINĀGARĪ	ROMAN	DEVANĀGARĪ
ट	ṬA	ट
ठ	ṬHA	ठ
ड	ḌA	ड
ढ	ḌHA	ढ
ण	ṆA	ण
त	TA	त
थ	THA	थ

NANDINĀGARĪ	ROMAN	DEVANĀGARĪ
द	DA	द
ध	DHA	ध
न	NA	न
प	PA	प
फ	PHA	फ
ब	BA	ब
भ	BHA	भ

NANDINĀGARĪ	ROMAN	DEVANĀGARĪ
म	MA	म
य	YA	य
र	RA	र
ल	LA	ल
व	VA	व
श	ŚA	श
ष	ṢA	ष

NANDINĀGARĪ	ROMAN	DEVANĀGARĪ
स	SA	स
ह	HA	ह
क्ष	KṢA	क्ष
ज्ञ	JÑA	ज्ञ

NUSVĀRA AND VISARGA

Nusvāra	◌̣
Visarga	◌̣ː

Figure 28: Charts showing basic characters of Nandinagari (from Visalakshy 2003: 24–27).

l. For the combination of the vowel 'l' with consonants, instead of a separate subsidiary symbol the letter for l itself is used.

Subsidiary Symbols of Vowels:

SUBSIDIARY SYMBOL (NANDINĀGARĪ)	VOWEL REPRESENTED	DEVANĀGARĪ
𑂔	Ā	आ
𑂕	I	इ
𑂖	Ī	ई
𑂗	U	उ
𑂘	Ū	ऊ
𑂙	Ṛ	ऋ

NANDINĀGARĪ	ROMAN	DEVANĀGARĪ
𑂚	KĀ	का
𑂛	KI	कि
𑂜	KĪ	की
𑂝	KU	कु
𑂞	KŪ	कू
𑂟	KṚ	कृ
𑂠	KṚ	क्लृ

SUBSIDIARY SYMBOL (NANDINĀGARĪ)	VOWEL REPRESENTED	DEVANĀGARĪ
𑂡	E	ए
𑂢	AI	ऐ
𑂣	O	ओ
𑂤	AU	औ

Letters Representing Consonant Vowel Combinations

Though 𑂡 does not occur with all consonants, its combination with consonants is not very much restricted and also has a regular pattern. Hence all C+𑂡 combinations are given. Only very few examples are found for the occurrence of consonant +vowel l.

NANDINĀGARĪ	ROMAN	DEVANĀGARĪ
𑂥	KA	क

NANDINĀGARĪ	ROMAN	DEVANĀGARĪ
𑂦	KE	के
𑂧	KAI	कै
𑂨	KO	को
𑂩	KAU	कौ
𑂪	KHA	ख
𑂫	KHĀ	खा
𑂬	KHI	खि

Figure 29: Dependent vowel signs in Nandinagari (from Visalakshy 2003: 30–33).

NUMERALS

In order to represent numerals, Nandināgarī uses ten symbols. They are as follows:

NANDINĀGARĪ	ROMAN	NANDINĀGARĪ	ROMAN
०	0	𑌵	5
𑌶	1	𑌶𑌵	6
𑌷	2	𑌷𑌵	7
𑌸	3	𑌸𑌵	8
𑌹	4	𑌹𑌵	9

The combination of these symbols derive higher numerals. The patterns of combinations are same as in Devanāgarī. The following are some examples:

NANDINĀGARĪ	ROMAN	NANDINĀGARĪ	ROMAN
𑌶𑌵	10	𑌶𑌵𑌵𑌵	1000
𑌶𑌶	11	𑌷𑌷𑌸𑌵	2235

Figure 30: Nandinagari digits (from Visalakshy 2003: 86).

CHAPTER VII

VARIANTS

Some variant letters/symbols noticed in Nandināgarī are given here. Some of the variants may be due to the interference of other writing systems such as Devanāgarī.

Nandināgarī		Letter Represented	
Regular Form	Variant Form	Roman	Devanāgarī
उ	उ	u	उ
रु	रु	r	ऋ
वे	वे, वे	e	ए
वे	वे, वे	ai	ऐ
कु	कु	ku	कु

Nandināgarī		Letter Represented	
Regular Form	Variant Form	Roman	Devanāgarī
कु	कु, कु	kū	कू
क्र	क्र	kra	क्र
ख	ख, ख	kha	ख
चा	चा	cā	चा
चि	चि	ci	चि
छ	छ, छ, छ	cha	छ

Nandināgarī		Letter Represented	
Regular Form	Variant Form	Roman	Devanāgarī
ठ	ठ	ṭha	ठ
ल	ल	tna	ल
त	त, त	tra	त्र
त्व	त्व	tva	त्व
द्य	द्य	dya	द्य
ध	ध, ध, ध, ध, ध	dha	ध

Nandināgarī		Letter Represented	
Regular Form	Variant Form	Roman	Devanāgarī
प	प	pa	प
प्प	प्प	ppa	प्प
फ	फ, फ	pha	फ
ब	ब, ब	ba	ब
भू	भू	bhū	भू
म	म, म, म	ma	म

Figure 31: Glyphic variants in Nandinagari (from Visalakshy 2003: 235–238).

Nandināgarī		Letter Represented	
Regular Form	Variant Form	Roman	Devanāgarī
य	य	ya	य
र	र	ra	र
रु	रु	rū	रु
ल	ल	la	ल
ल	ल	rla	ल

Nandināgarī		Letter Represented	
Regular Form	Variant Form	Roman	Devanāgarī
ष	ष	ṣa	ष
ष्ट	ष्ट	ṣṭa	ष्ट
श्री	श्री	sri	श्री
ज्ञ	ज्ञ	jña	ज्ञ
०(Anusvāra)	०	ṁ	०

Nandināgarī		Letter Represented	
Regular Form	Variant Form	Roman	Devanāgarī
२	२	2	२
६	६	6	६
७	७	7	७
९	९	9	९

Figure 32: Glyphic variants in Nandinagari (from Visalakshy 2003: 235–238).

The following letters show close resemblance and care is required to distinguish them.

	NANDINĀGARĪ	ROMAN	DEVANĀGARĪ
SET I	३	I	इ
	उ	U	उ
	३	DA	ड
	३	JA	ज
SET II	७	JHA	झ
	७	RA	र

	ROMAN	DEVANĀGARĪ	NANDINĀGARĪ
SET III	त	TA	त
	भ	BHA	भ
SET IV	ड	NA	ड
	द	DA	द
SET V	प	PA	प
	य	YA	य

CONSONANT VOWEL COMBINATIONS

As already pointed out, the basic consonant letter represents the combination of consonant and the vowel 'a'. All the other vowel combinations with the consonants are represented by using subsidiary symbols with the basic consonant letter except in the case of

Figure 33: Internal 'confusables' in Nandinagari (from Visalakshy 2003: 28–29).

Appendix: Distinctive Features of Nandinagari

<i>Vowels</i>	<i>Initial</i>	<i>Diacritic</i>	<i>k-Ligatures</i>
a	𑌵 & 𑌶 & 𑌷		𑌸
ā	𑌵𑌃 & 𑌶𑌃 & 𑌷𑌃	𑌵𑌶	𑌸𑌃
i	𑌵 & 𑌶	𑌵𑌶 & 𑌶𑌶 & 𑌶	𑌸𑌶 & 𑌸𑌶 & 𑌸𑌶
ī	𑌵𑌶 & 𑌶𑌶	𑌵𑌶	𑌸𑌶
u	𑌵 & 𑌶	𑌵𑌶	𑌸𑌶
ū	𑌵𑌶 & 𑌶𑌶	𑌵𑌶	𑌸𑌶
r	𑌵 (=“r̥”)	𑌵𑌶	𑌸𑌶
r̄	𑌵 (=“r̄”)	𑌵𑌶	𑌸𑌶
l	(not documented)	𑌵𑌶	𑌸𑌶
l̄	(not documented)		
e	𑌵 & 𑌶	𑌵𑌶	𑌸𑌶
ai	𑌵 & 𑌶	𑌵𑌶	𑌸𑌶
o	𑌵 & 𑌶	𑌵𑌶	𑌸𑌶
au	𑌵	𑌵𑌶	𑌸𑌶

Figure 34: Distinctive features of Nandinagari (from Grünendahl 2001: 201).

*Consonants: Velar**Retroflex*

ka	𑖅	ṭa	𑖇 & 𑖈 & 𑖉
kha	𑖆 & 𑖇	ṭha	𑖊 & 𑖋 & 𑖌 (cf. ḍha)
ga	𑖍 & 𑖎 & 𑖏 & 𑖐 & 𑖑	ḍa	𑖒 & 𑖓
gha	𑖔 & 𑖕	ḍha	𑖖
ṇa*	𑖘	ṇa	𑖙

*Palatal**Dental*

ca	𑖚 & 𑖛	ta	𑖜
cha	𑖞 & 𑖟 & 𑖠 (cf. ccha)	tha	𑖡 & 𑖢
ja	𑖣 & 𑖤	da	𑖥 & 𑖦
jha†	𑖧	dha	𑖨 & 𑖩 & 𑖪
ña	(not documented)	na	𑖬

* interpolated from conjuncts

† to be distinguished from 𑖧 ru

Figure 35: Distinctive features of Nandinagari (from Grünendahl 2001: 202).

NANDINAGARI				203
<i>Labial</i>		<i>Sibilants</i>		
pa	प & प	śa	रा & रा	
pha	फ & फ	ṣa	ष & ष	
ba	ब	sa	स & स	
bha	भ & भ			
ma	म			
<i>Sonorants</i>		<i>Other</i>		
ya	य & य & प & प & ण	ha	ह & ह	
ra	र	ḷa	ळ	
la	ल & ल			
va	व & व			

Figure 36: Distinctive features of Nandinagari (from Grünendahl 2001: 203).

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APPENDIX

Additional Graphs

◦	-ṁ (<i>anusvāra</i>)
ॐ	-ñ (<i>anunāsika</i>)
ः & ॥	-ḥ (<i>visarga</i>)
ॐ	<i>avagraha</i>
◻ & ◻	<i>virāma</i> , e.g. -ṭ ॢ -ṭ ॣ & ॣ
◻ & ◻ & ◻	Vedic accents (preceding accented syllables)
ॐ	<i>om</i>

Numerals (cf. pp. 138, 180)

०	१	२ & ३ & ४ & ५	६	७ & ८
1	2	3	4	5
६ & ७	८ & ९	१० & ११	१२ & १३	१४
6	7	8	9	0

Figure 37: Distinctive features of Nandinagari (from Grünendahl 2001: 204).

Conjuncts

kka	क	gga	ग
kca	क	gna	ग
кта	क	ग	ग
ktyā	क	ग	ग
ktra	क	ग	ग
ktva	क		
ktha	क	ghna	घ
kya	क		
kra	क	ṅ- usually appears as anusvāra	
kla	क	ṅmu	ङ
kṣa	क्ष	kṣū	क्ष
kṣma	क्ष	cca	च
kṣmyā	क्ष	ccha	च (cf. cha) च
kṣya	क्ष	cchṛ	च (also for cchru)
		cchva	च
khya	ख	cya	य

Figure 38: Distinctive features of Nandinagari (from Grünendahl 2001: 205).

206	APPENDIX			
cyu	चु	dhva	ध्व	
cra	च			
		ṇya	ण	ण
jjha	झ	ṇva	ण्व	
jña	ज्ञ			
jñya	ज्ञ	tka	क	tku कृ
jya	ज	tta	त	त
jyo	जो	tna	न	
jva	ज्व	tpa	प	प
		tpra	प्र	
ñ- is usually appears as anusvāra		tpha	फ	
		tma	म	
ṭya	ट	tmya	म	
ṭva	ट्व	tya	य	
		tra	त्र	
ḍya	ड	trya	य	

Figure 39: Distinctive features of Nandinagari (from Grünendahl 2001: 206).

NANDINAGARI				207
tva	वे		dhva	व्ह ध
tsa	त्सा	त्सा		
tsya	त्स्या		nta	न्त न्ह
tsva	त्स्व		nma	न्म
			nya	न्या न्यु न्य
dga	ङ		nva	न्व
dda	ड	ddu	ड्ड ड्ड	
ddha	ड्ह	ड्ड	pta	प्ता
dba	ड्ब		pna	प्ना
dbra	ड्ब्र		pno	प्नो प्नो
dma	ड्म		pra	प्रा प्प्रा
dya	ड्या	dyu		ड्यु
dra	ड्र	ड्र	bda	ब्दा
dva	ड्व		bra	ब्ब्र
dhya	व्या ध्या		bhya	ब्ध्या

Figure 40: Distinctive features of Nandinagari (from Grünendahl 2001: 207).

208		APPENDIX			
bhra	𑂔		vya	𑂶	
			vra	𑂷	
mpa	𑂙				
mya	𑂚		śca	𑂼	
mra	𑂛		śna	𑂽	
			śya	𑂾	
yya	𑂿 𑃀		śra	𑂿	
			śrī	𑃁	śrū 𑃂
rda	𑃃		śva	𑃄	
rma	𑃅				
rya	𑃆		ṣka	𑃇 𑃈	
rṣa	𑃉		ṣkr	𑃊	
rṣe	𑃋		ṣta	𑃌	
rṣya	𑃍		ṣtra	𑃎	
			ṣtva	𑃏 𑃐	
lkya	𑃑		ṣtha	𑃒 𑃓	

Figure 41: Distinctive features of Nandinagari (from Grünendahl 2001: 208).

NANDINAGARI					209
ṣṇa	ॠ		sma	रॠ	रॠ
ṣṇu	ॡ		sya	रॡ	रॡ
ṣṇva	ॢ		sra	रॢ	रॢ
ṣma	ॣ	ॣ	sva	रॣ	रॣ
ṣya	।				
ṣva	॥		hna	र॥	
			hma	र॥	
ska	र॥	र॥	hya	र॥	
sta	र॥	र॥	hla	र॥	
stra	र॥	र॥	hva	र॥	
stha	र॥	र॥			र॥

Figure 42: Distinctive features of Nandinagari (from Grünendahl 2001: 209).

<u>Vowels</u>				
अ a(अ)	आ ā(आ)	इ i(इ)	ई ī(ई)	
उ u(उ)	ऊ ū(ऊ)	ऋ ṛ(ऋ)	ॠ ṝ(ॠ)	
ए e(ए)	ऐ ai(ऐ)	ओ o(ओ)	औ au(औ)	
<u>Consonants</u>				
क k(क)	ख kh(ख)	ग g(ग)	घ gh(घ)	ङ ṅ(ङ)
च c(च)	छ ch(छ)	ज j(ज)	झ jh(झ)	ञ ñ(ञ)
ट ṭ(ट)	ठ ṭh(ठ)	ड ḍ(ड)	ढ ḍh(ढ)	ण ṇ(ण)
त t(त)	थ th(थ)	द d(द)	ध dh(ध)	न n(न)
प p(प)	फ ph(फ)	ब b(ब)	भ bh(भ)	म m(म)
य y(य)	र r(र)	ल l(ल)	व v(व)	
श ś(श)	ष ṣ(ष)	स s(स)	ह h(ह)	

Figure 43: A chart showing letters of Nandinagari (from Mukhopadhyaya 2005).