

Title: Preliminary Proposal to Encode Nandinagari in ISO/IEC 10646
Source: Script Encoding Initiative (SEI)
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1 Introduction

This is a preliminary proposal to encode Nandinagari in the Universal Character Set (ISO/IEC 10646). It provides a draft character repertoire, names list, and some specimens. Research on the script is ongoing and a formal proposal is forthcoming.

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 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 the comparison in table 1). However, Nandinagari differs from Devanagari in the shapes of character glyphs, the lack of a connecting headline, and, particularly, in the rendering of consonant conjuncts (see figures 14–18; note the shapes of *kṣa* and *jña*, and the form of *ya* as C₂). There are also several styles of Nandinagari, which are to be treated as variant forms of the script. As such, Nandinagari cannot be considered a stylistic variant of Devanagari and the various styles of Nandinagari cannot be properly classified as variants of Devanagari. The independent status of Nandinagari is perhaps best articulated by Saraju Rath, 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.

Thus, despite its similarities to Devanagari, Nandinagari cannot be unified with the former in the UCS. The proper representation of Nandinagari in plain text requires the preservation of its glyphic repertoire, rendering behaviors, and stylistic variants. This can only be accomplished at the character level, through character content that is independent of font changes, alterations to text styles, or other formatting.

There is a requirement for encoding Nandinagari in the UCS in order to support current usage of the script. A community of scholars are working with Nandinagari, primarily in the preservation of manuscripts. The Sri Vadiraja Research Foundation, sponsored jointly by the National Mission for Manuscripts of the Government of India and the Puttige Math in Udipi, Karnataka has been working to preserve palm leaf manuscripts in Nandinagari from 2007 to the present (Prabhu 2012). An encoding for Nandinagari in the UCS will certainly be of benefit to these specialista and projects.

2 Script Details

2.1 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 in certain environments. These are described below.

2.2 Representative Glyphs

The character glyphs used here are derived from Grünendahl (2001). Those not found in Grünendahl are sourced from Visalakshy (2003). As mentioned, there are several styles of Nandinagari and there are several glyphic variants for some characters. Additional research and communication with experts is required in order to determine the most appropriate representative glyphs for Nandinagari characters.

2.3 Virāma

The Nandinagari ॠ VIRAMA is identical in function to the corresponding character in other Indic scripts.

2.4 Vowels

There are 10 vowel letters:

| | | | | | |
|---|-----------------|---|-----------------|---|-----------------|
| अ | VOWEL LETTER A | उ | VOWEL LETTER U | ऋ | VOWEL LETTER O |
| आ | VOWEL LETTER AA | ऊ | VOWEL LETTER UU | ॠ | VOWEL LETTER AU |
| इ | VOWEL LETTER I | ए | VOWEL LETTER E | | |
| ई | VOWEL LETTER II | ऐ | VOWEL LETTER AI | | |

Sources show ॡ *VOWEL LETTER VOCALIC R and ॢ *VOWEL LETTER VOCALIC RR as atomic characters; however, they may be represented using the sequences <ॡ RA, ॣ VOWEL SIGN VOCALIC R> and <ॡ RA, । VOWEL SIGN VOCALIC RR>. Space has been reserved in the code chart for these characters in the case that distinctive forms are identified. Figure 3 shows an independent form for *VOWEL LETTER VOCALIC L; however, this form also appears to be composed of a consonant and vowel sign. Space has been reserved for *VOWEL LETTER VOCALIC L and *VOWEL LETTER VOCALIC LL in the event these are identified as distinct characters.

2.5 Vowel Signs

There are 13 dependent vowel signs:

| | | | | | |
|----|---------------|----|-----------------------|----|---------------|
| आँ | VOWEL SIGN AA | ऊँ | VOWEL SIGN UU | ॠँ | VOWEL SIGN AI |
| अं | VOWEL SIGN I | ॣ | VOWEL SIGN VOCALIC R | ॠँ | VOWEL SIGN O |
| इं | VOWEL SIGN II | । | VOWEL SIGN VOCALIC RR | ॠँ | VOWEL SIGN AU |
| उं | VOWEL SIGN U | ॥ | VOWEL SIGN E | | |

Figure 10 shows an atomic form for *VOWEL SIGN VOCALIC L. This, however, appears to be a conjunct formed from a consonant + a half-form of LA + a visible VIRAMA. Shriramana Sharma reports that in Grantha and other southern Brahmi scripts the VOWEL SIGN VOCALIC L is often represented using the above sequence. Space has been reserved for *VOWEL SIGN VOCALIC L and *VOWEL SIGN VOCALIC LL in the event that distinctive forms for these characters are identified.

2.6 Consonants

There are 34 consonant letters:

| | | | | | | | |
|---|-----|---|------|---|-----|---|-----|
| 𑀓 | KA | 𑀕 | NYA | 𑀗 | DHA | 𑀙 | LA |
| 𑀔 | KHA | 𑀖 | TTA | 𑀘 | NA | 𑀚 | LLA |
| 𑀕 | GA | 𑀗 | TTHA | 𑀙 | PA | 𑀛 | VA |
| 𑀖 | GHA | 𑀘 | DDA | 𑀚 | PHA | 𑀜 | SHA |
| 𑀗 | NGA | 𑀙 | DDHA | 𑀛 | BA | 𑀝 | SSA |
| 𑀘 | CA | 𑀚 | NNA | 𑀜 | BHA | 𑀞 | SA |
| 𑀙 | CHA | 𑀛 | TA | 𑀞 | MA | 𑀟 | HA |
| 𑀚 | JA | 𑀜 | THA | 𑀟 | YA | | |
| 𑀛 | JHA | 𑀞 | DA | 𑀟 | RA | | |

Each consonant letter bears an inherent vowel, represented by /a/ (𑀓 A). This inherent vowel is silenced using 𑀑 VIRAMA. Conjuncts are encoded as in other Brahmi-based scripts.

2.7 Various Signs

1. Nasalization is indicated using the combining signs 𑀑𑀓 CANDRABINDU and 𑀑𑀔 ANUSVARA.
2. The combining sign 𑀑𑀕 VISARGA is identical to the corresponding character in Devanagari.
3. The 𑀑 AVAGRAHA is identical to the corresponding character in Devanagari.

2.8 Digits

There is a full set of decimal digits: 𑀑 ZERO, 𑀒 ONE, 𑀓 TWO, 𑀔 THREE, 𑀕 FOUR, 𑀖 FIVE, 𑀗 SIX, 𑀘 SEVEN, 𑀙 EIGHT, 𑀚 NINE.

2.9 Punctuation

Nandinagari uses *danḍā*-s for punctuation (see figure 1). These should be unified with the corresponding Devanagari characters.

2.10 Headstroke

The headstroke of Nandinagari characters do not join with that of the following character.

2.11 Characters Not Included in the Tentative Repertoire

Grünendahl identifies three characters used for marking Vedic accents — ॠ, ॡ, ॢ — (see figure 13), but does not provide details on their usage. Additional research is required regarding the attestation of these signs. If they are suitable for encoding, then it may be appropriate to place them in the Vedic Extensions block (1CD0..1CFF) instead of in the proposed Nandinagari block.

3 Tentative Character Properties

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11D50; NANDINAGARI LETTER A;Lo;0;L;;;;N;;;;;
11D51; NANDINAGARI LETTER AA;Lo;0;L;;;;N;;;;;
11D52; NANDINAGARI LETTER I;Lo;0;L;;;;N;;;;;
11D53; NANDINAGARI LETTER II;Lo;0;L;;;;N;;;;;
11D54; NANDINAGARI LETTER U;Lo;0;L;;;;N;;;;;
11D55; NANDINAGARI LETTER UU;Lo;0;L;;;;N;;;;;
11D56;<reserved>
11D57;<reserved>
11D58;<reserved>
11D59;<reserved>
11D5A; NANDINAGARI LETTER E;Lo;0;L;;;;N;;;;;
11D5B; NANDINAGARI LETTER AI;Lo;0;L;;;;N;;;;;
11D5C; NANDINAGARI LETTER O;Lo;0;L;;;;N;;;;;
11D5D; NANDINAGARI LETTER AU;Lo;0;L;;;;N;;;;;
11D5E; NANDINAGARI LETTER KA;Lo;0;L;;;;N;;;;;
11D5F; NANDINAGARI LETTER KHA;Lo;0;L;;;;N;;;;;
11D60; NANDINAGARI LETTER GA;Lo;0;L;;;;N;;;;;
11D61; NANDINAGARI LETTER GHA;Lo;0;L;;;;N;;;;;
11D62; NANDINAGARI LETTER NGA;Lo;0;L;;;;N;;;;;
11D63; NANDINAGARI LETTER CA;Lo;0;L;;;;N;;;;;
11D64; NANDINAGARI LETTER CHA;Lo;0;L;;;;N;;;;;
11D65; NANDINAGARI LETTER JA;Lo;0;L;;;;N;;;;;
11D66; NANDINAGARI LETTER JHA;Lo;0;L;;;;N;;;;;
11D67; NANDINAGARI LETTER NYA;Lo;0;L;;;;N;;;;;
11D68; NANDINAGARI LETTER TTA;Lo;0;L;;;;N;;;;;
11D69; NANDINAGARI LETTER TTHA;Lo;0;L;;;;N;;;;;
11D6A; NANDINAGARI LETTER DDA;Lo;0;L;;;;N;;;;;
11D6B; NANDINAGARI LETTER DDHA;Lo;0;L;;;;N;;;;;
11D6C; NANDINAGARI LETTER NNA;Lo;0;L;;;;N;;;;;
11D6D; NANDINAGARI LETTER TA;Lo;0;L;;;;N;;;;;
11D6E; NANDINAGARI LETTER THA;Lo;0;L;;;;N;;;;;
11D6F; NANDINAGARI LETTER DA;Lo;0;L;;;;N;;;;;
11D70; NANDINAGARI LETTER DHA;Lo;0;L;;;;N;;;;;
11D71; NANDINAGARI LETTER NA;Lo;0;L;;;;N;;;;;
11D72; NANDINAGARI LETTER PA;Lo;0;L;;;;N;;;;;
11D73; NANDINAGARI LETTER PHA;Lo;0;L;;;;N;;;;;
11D74; NANDINAGARI LETTER BA;Lo;0;L;;;;N;;;;;
11D75; NANDINAGARI LETTER BHA;Lo;0;L;;;;N;;;;;
11D76; NANDINAGARI LETTER MA;Lo;0;L;;;;N;;;;;
11D77; NANDINAGARI LETTER YA;Lo;0;L;;;;N;;;;;
11D78; NANDINAGARI LETTER RA;Lo;0;L;;;;N;;;;;
11D79; NANDINAGARI LETTER LA;Lo;0;L;;;;N;;;;;
11D7A; NANDINAGARI LETTER LLA;Lo;0;L;;;;N;;;;;
11D7B; NANDINAGARI LETTER VA;Lo;0;L;;;;N;;;;;
11D7C; NANDINAGARI LETTER SHA;Lo;0;L;;;;N;;;;;
11D7D; NANDINAGARI LETTER SSA;Lo;0;L;;;;N;;;;;
11D7E; NANDINAGARI LETTER SA;Lo;0;L;;;;N;;;;;
11D7F; NANDINAGARI LETTER HA;Lo;0;L;;;;N;;;;;
11D80; NANDINAGARI VOWEL SIGN AA;Mc;0;L;;;;N;;;;;

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11D81;NANDINAGARI VOWEL SIGN I;Mc;0;L;;;;N;;;;;
 11D82;NANDINAGARI VOWEL SIGN II;Mc;0;L;;;;N;;;;;
 11D83;NANDINAGARI VOWEL SIGN U;Mn;0;NSM;;;;N;;;;;
 11D84;NANDINAGARI VOWEL SIGN UU;Mn;0;NSM;;;;N;;;;;
 11D85;NANDINAGARI VOWEL SIGN VOCALIC R;Mn;0;NSM;;;;N;;;;;
 11D86;NANDINAGARI VOWEL SIGN VOCALIC RR;Mn;0;NSM;;;;N;;;;;
 11D87;<reserved>
 11D88;<reserved>
 11D89;NANDINAGARI VOWEL SIGN E;Mn;0;NSM;;;;N;;;;;
 11D8A;NANDINAGARI VOWEL SIGN AI;Mn;0;NSM;;;;N;;;;;
 11D8B;NANDINAGARI VOWEL SIGN O;Mn;0;NSM;;;;N;;;;;
 11D8C;NANDINAGARI VOWEL SIGN AU;Mc;0;L;;;;N;;;;;
 11D8D;NANDINAGARI SIGN CANDRABINDU;Mn;0;NSM;;;;N;;;;;
 11D8E;NANDINAGARI SIGN ANUSVARA;Mn;0;NSM;;;;N;;;;;
 11D8F;NANDINAGARI SIGN VISARGA;Mc;0;L;;;;N;;;;;
 11D90;NANDINAGARI SIGN VIRAMA;Mc;9;L;;;;N;;;;;
 11D91;NANDINAGARI SIGN AVAGRAHA;Lo;0;L;;;;N;;;;;
 11DA0;NANDINAGARI DIGIT ZERO;Nd;0;L;0;0;0;N;;;;;
 11DA1;NANDINAGARI DIGIT ONE;Nd;0;L;1;1;1;N;;;;;
 11DA2;NANDINAGARI DIGIT TWO;Nd;0;L;2;2;2;N;;;;;
 11DA3;NANDINAGARI DIGIT THREE;Nd;0;L;3;3;3;N;;;;;
 11DA4;NANDINAGARI DIGIT FOUR;Nd;0;L;4;4;4;N;;;;;
 11DA5;NANDINAGARI DIGIT FIVE;Nd;0;L;5;5;5;N;;;;;
 11DA6;NANDINAGARI DIGIT SIX;Nd;0;L;6;6;6;N;;;;;
 11DA7;NANDINAGARI DIGIT SEVEN;Nd;0;L;7;7;7;N;;;;;
 11DA8;NANDINAGARI DIGIT EIGHT;Nd;0;L;8;8;8;N;;;;;
 11DA9;NANDINAGARI DIGIT NINE;Nd;0;L;9;9;9;N;;;;;

4 References

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| | 11D5 | 11D6 | 11D7 | 11D8 | 11D9 | 11DA |
|---|------------|------------|------------|------------|------------|------------|
| 0 | 𑌵 11D50 | 𑌶 11D60 | 𑌷 11D70 | 𑌸 11D80 | 𑌹 11D90 | 𑌺 11DA0 |
| 1 | 𑌻 11D51 | 𑌼 11D61 | 𑌽 11D71 | 𑌾 11D81 | 𑌿 11D91 | 𑍀 11DA1 |
| 2 | 𑍁 11D52 | 𑍂 11D62 | 𑍃 11D72 | 𑍄 11D82 | | 𑍅 11DA2 |
| 3 | 𑍇 11D53 | 𑍈 11D63 | 𑍉 11D73 | 𑍊 11D83 | | 𑍋 11DA3 |
| 4 | 𑍍 11D54 | 𑍎 11D64 | 𑍏 11D74 | 𑍐 11D84 | | 𑍑 11DA4 |
| 5 | 𑍓 11D55 | 𑍔 11D65 | 𑍕 11D75 | 𑍖 11D85 | | 𑍗 11DA5 |
| 6 | | 𑍙 11D66 | 𑍚 11D76 | 𑍛 11D86 | | 𑍜 11DA6 |
| 7 | | 𑍝 11D67 | 𑍞 11D77 | | | 𑍟 11DA7 |
| 8 | | 𑍡 11D68 | 𑍢 11D78 | | | 𑍣 11DA8 |
| 9 | | 𑍥 11D69 | 𑍦 11D79 | 𑍧 11D89 | | 𑍨 11DA9 |
| A | 𑍩 11D5A | 𑍪 11D6A | 𑍫 11D7A | 𑍬 11D8A | | |
| B | 𑍭 11D5B | 𑍮 11D6B | 𑍯 11D7B | 𑍰 11D8B | | |
| C | 𑍲 11D5C | 𑍳 11D6C | 𑍴 11D7C | 𑍵 11D8C | | |
| D | 𑍷 11D5D | 𑍸 11D6D | 𑍹 11D7D | 𑍺 11D8D | | |
| E | 𑍽 11D5E | 𑍾 11D6E | 𑍿 11D7E | 𑎀 11D8E | | |
| F | 𑎁 11D5F | 𑎂 11D6F | 𑎃 11D7F | 𑎄 11D8F | | |

Independent vowels

| | | |
|-------|---|-----------------------|
| 11D50 | 𑌀 | NANDINAGARI LETTER A |
| 11D51 | 𑌁 | NANDINAGARI LETTER AA |
| 11D52 | 𑌂 | NANDINAGARI LETTER I |
| 11D53 | 𑌃 | NANDINAGARI LETTER II |
| 11D54 | 𑌄 | NANDINAGARI LETTER U |
| 11D55 | 𑌅 | NANDINAGARI LETTER UU |
| 11D56 | 𑌆 | <reserved> |
| 11D57 | 𑌇 | <reserved> |
| 11D58 | 𑌈 | <reserved> |
| 11D59 | 𑌉 | <reserved> |
| 11D5A | 𑌊 | NANDINAGARI LETTER E |
| 11D5B | 𑌋 | NANDINAGARI LETTER AI |
| 11D5C | 𑌌 | NANDINAGARI LETTER O |
| 11D5D | 𑌍 | NANDINAGARI LETTER AU |

Consonants

| | | |
|-------|---|-------------------------|
| 11D5E | 𑌎 | NANDINAGARI LETTER KA |
| 11D5F | 𑌏 | NANDINAGARI LETTER KHA |
| 11D60 | 𑌐 | NANDINAGARI LETTER GA |
| 11D61 | 𑌑 | NANDINAGARI LETTER GHA |
| 11D62 | 𑌒 | NANDINAGARI LETTER NGA |
| 11D63 | 𑌓 | NANDINAGARI LETTER CA |
| 11D64 | 𑌔 | NANDINAGARI LETTER CHA |
| 11D65 | 𑌕 | NANDINAGARI LETTER JA |
| 11D66 | 𑌖 | NANDINAGARI LETTER JHA |
| 11D67 | 𑌗 | NANDINAGARI LETTER NYA |
| 11D68 | 𑌘 | NANDINAGARI LETTER TTA |
| 11D69 | 𑌙 | NANDINAGARI LETTER TTHA |
| 11D6A | 𑌚 | NANDINAGARI LETTER DDA |
| 11D6B | 𑌛 | NANDINAGARI LETTER DDHA |
| 11D6C | 𑌜 | NANDINAGARI LETTER NNA |
| 11D6D | 𑌝 | NANDINAGARI LETTER TA |
| 11D6E | 𑌞 | NANDINAGARI LETTER THA |
| 11D6F | 𑌟 | NANDINAGARI LETTER DA |
| 11D70 | 𑌠 | NANDINAGARI LETTER DHA |
| 11D71 | 𑌡 | NANDINAGARI LETTER NA |
| 11D72 | 𑌢 | NANDINAGARI LETTER PA |
| 11D73 | 𑌣 | NANDINAGARI LETTER PHA |
| 11D74 | 𑌤 | NANDINAGARI LETTER BA |
| 11D75 | 𑌥 | NANDINAGARI LETTER BHA |
| 11D76 | 𑌦 | NANDINAGARI LETTER MA |
| 11D77 | 𑌧 | NANDINAGARI LETTER YA |
| 11D78 | 𑌨 | NANDINAGARI LETTER RA |
| 11D79 | 𑌩 | NANDINAGARI LETTER LA |
| 11D7A | 𑌪 | NANDINAGARI LETTER LLA |
| 11D7B | 𑌫 | NANDINAGARI LETTER VA |
| 11D7C | 𑌬 | NANDINAGARI LETTER SHA |
| 11D7D | 𑌭 | NANDINAGARI LETTER SSA |
| 11D7E | 𑌮 | NANDINAGARI LETTER SA |
| 11D7F | 𑌯 | NANDINAGARI LETTER HA |

Dependent vowel signs

| | | |
|-------|---|-----------------------------------|
| 11D80 | 𑌰 | NANDINAGARI VOWEL SIGN AA |
| 11D81 | 𑌱 | NANDINAGARI VOWEL SIGN I |
| 11D82 | 𑌲 | NANDINAGARI VOWEL SIGN II |
| 11D83 | 𑌳 | NANDINAGARI VOWEL SIGN U |
| 11D84 | 𑌴 | NANDINAGARI VOWEL SIGN UU |
| 11D85 | 𑌵 | NANDINAGARI VOWEL SIGN VOCALIC R |
| 11D86 | 𑌶 | NANDINAGARI VOWEL SIGN VOCALIC RR |
| 11D87 | 𑌷 | <reserved> |
| 11D88 | 𑌸 | <reserved> |
| 11D89 | 𑌹 | NANDINAGARI VOWEL SIGN E |
| 11D8A | 𑌺 | NANDINAGARI VOWEL SIGN AI |
| 11D8B | 𑌻 | NANDINAGARI VOWEL SIGN O |
| 11D8C | 𑌼 | NANDINAGARI VOWEL SIGN AU |

Various signs

| | | |
|-------|---|------------------------------|
| 11D8D | 𑌽 | NANDINAGARI SIGN CANDRABINDU |
| 11D8E | 𑌾 | NANDINAGARI SIGN ANUSVARA |
| 11D8F | 𑌿 | NANDINAGARI SIGN VISARGA |
| 11D90 | 𑍀 | NANDINAGARI SIGN VIRAMA |
| 11D91 | 𑍁 | NANDINAGARI SIGN AVAGRAHA |

Digits

| | | |
|-------|---|-------------------------|
| 11DA0 | 𑍂 | NANDINAGARI DIGIT ZERO |
| 11DA1 | 𑍃 | NANDINAGARI DIGIT ONE |
| 11DA2 | 𑍄 | NANDINAGARI DIGIT TWO |
| 11DA3 | 𑍅 | NANDINAGARI DIGIT THREE |
| 11DA4 | 𑍆 | NANDINAGARI DIGIT FOUR |
| 11DA5 | 𑍇 | NANDINAGARI DIGIT FIVE |
| 11DA6 | 𑍈 | NANDINAGARI DIGIT SIX |
| 11DA7 | 𑍉 | NANDINAGARI DIGIT SEVEN |
| 11DA8 | 𑍊 | NANDINAGARI DIGIT EIGHT |
| 11DA9 | 𑍋 | NANDINAGARI DIGIT NINE |

| | NANDI- NAGARI | DEVA- NAGARI | | NANDI- NAGARI | DEVA- NAGARI | | NANDI- NAGARI | DEVA- NAGARI |
|-----|------------------|-----------------|------|------------------|-----------------|-----------------|------------------|-----------------|
| A | 𑌒 | अ | TTA | 𑌔 | ट | SHA | रा | श |
| AA | 𑌓 | आ | TTHA | 𑌕 | ठ | SSA | ष | ष |
| I | 𑌖 | इ | DDA | 𑌗 | ड | SA | रा | स |
| II | 𑌘 | ई | DDHA | 𑌙 | ढ | HA | रु | ह |
| U | 𑌚 | उ | NNA | 𑌛 | ण | SIGN AA | ी | ा |
| UU | 𑌜 | ऊ | TA | 𑌝 | त | SIGN I | ि | ि |
| E | 𑌞 | ए | THA | 𑌟 | थ | SIGN II | ी | ी |
| AI | 𑌠 | ऐ | DA | 𑌡 | द | SIGN U | ु | ु |
| O | 𑌢 | ओ | DHA | 𑌣 | ध | SIGN UU | ू | ू |
| AU | 𑌤 | औ | NA | 𑌥 | न | SIGN VOCALIC R | ्र | ्र |
| KA | 𑌧 | क | PA | 𑌨 | प | SIGN VOCALIC RR | ्र | ्र |
| KHA | 𑌩 | ख | PHA | 𑌪 | फ | SIGN E | े | े |
| GA | 𑌬 | ग | BA | 𑌭 | ब | SIGN AI | ै | ै |
| GHA | 𑌮 | घ | BHA | 𑌯 | भ | SIGN O | ो | ो |
| NGA | 𑌰 | ङ | MA | 𑌱 | म | SIGN AU | ौ | ौ |
| CA | 𑌳 | च | YA | 𑌴 | य | CANDRABINDU | ँ | ँ |
| CHA | 𑌵 | छ | RA | 𑌶 | र | ANUSVARA | ं | ं |
| JA | 𑌸 | ज | LA | 𑌹 | ल | VISARGA | ः | ः |
| JHA | 𑌺 | झ | LLA | 𑌻 | ळ | VIRAMA | ् | ् |
| NYA | 𑌽 | ञ | VA | 𑌿 | व | AVAGRAHA | ः | ः |

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

The Krāku Grant of Harihara II - Plate XXXV

Śaka 1298 (A.D.1376/1377)

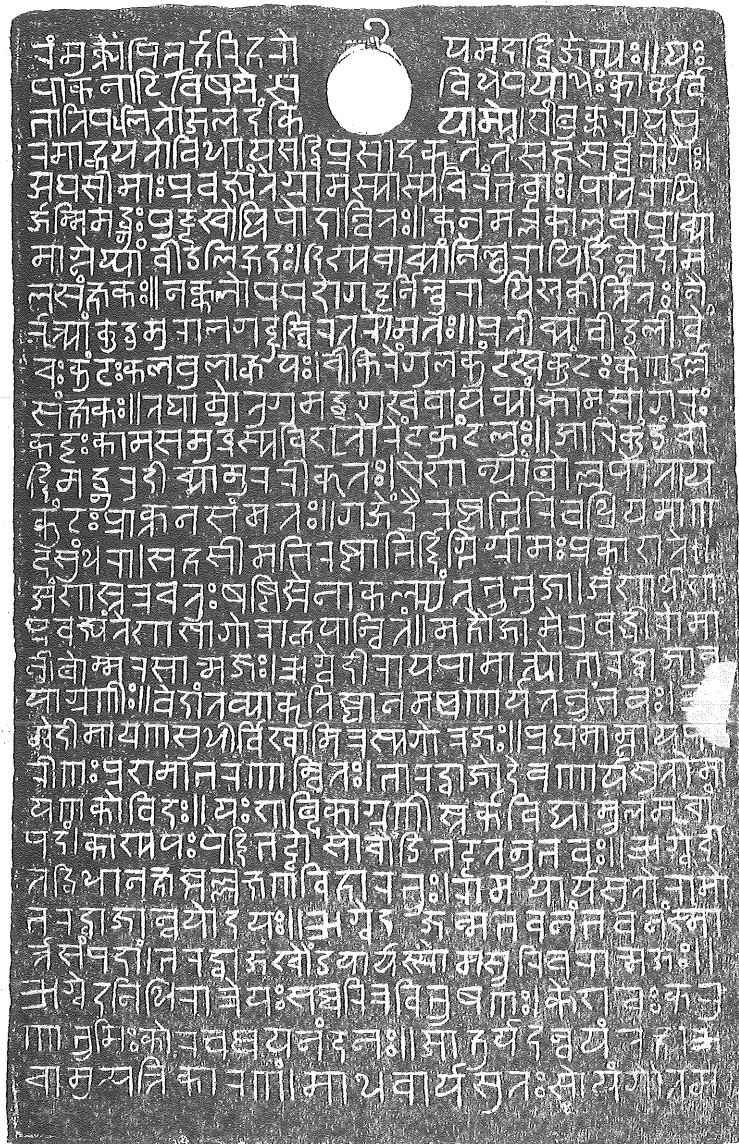


Figure 1: A plate containing a record in Nandinagari (from Visalakshy 2003: 266).

| <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 2: A chart showing letters of Nandinagari (from Mukhopadhyaya 2005).

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-śa 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 ḷ are derived from the consonant letters 'ra' and 'la'. The letters for long vowels ṛ and ḷ are absent. The diphthong '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 |
| ऌ | ḷ | ऌ |
| 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 | ÑA | ञ |

Figure 3: Charts showing basic characters of Nandinagari (from Visalakshy 2003: 20–23).

| NANDINĀGARĪ | ROMAN | DEVANĀGARĪ |
|-------------|-------|------------|
| ॠ | ṬA | ट |
| ॡ | ṬHA | ठ |
| ॢ | ḌA | ड |
| ॣ | 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

Anusvāra °
 Visarga :

Figure 4: Charts showing basic characters of Nandinagari (from Visalakshy 2003: 24–27).

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

Subsidiary Symbols of Vowels:

| SUBSIDIARY SYMBOL (NANDINĀGARĪ) | VOWEL REPRESENTED | DEVANĀGARĪ |
|------------------------------------|-------------------|------------|
| 𑂗 | Ā | आ |
| 𑂘 | I | इ |
| 𑂙 | Ī | ई |
| 𑂚 | U | उ |
| 𑂛 | Ū | ऊ |
| 𑂜 | Ṛ | ऋ |

| SUBSIDIARY SYMBOL (NANDINĀGARĪ) | VOWEL REPRESENTED | DEVANĀGARĪ |
|------------------------------------|-------------------|------------|
| 𑂝 | E | ए |
| 𑂞 | AI | ऐ |
| 𑂟 | O | ओ |
| 𑂠 | AU | औ |

Letters Representing Consonant Vowel Combinations

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

| NANDINĀGARĪ | ROMAN | DEVANĀGARĪ |
|-------------|-------|------------|
| 𑂡 | KA | क |

| NANDINĀGARĪ | ROMAN | DEVANĀGARĪ |
|-------------|-------|------------|
| 𑂢 | KĀ | का |
| 𑂣 | KI | कि |
| 𑂤 | KĪ | की |
| 𑂥 | KU | कु |
| 𑂦 | KŪ | कू |
| 𑂧 | KṚ | कृ |
| 𑂨 | Kḷ | क्लृ |

| NANDINĀGARĪ | ROMAN | DEVANĀGARĪ |
|-------------|-------|------------|
| 𑂩 | KE | के |
| 𑂪 | KAI | कै |
| 𑂫 | KO | को |
| 𑂬 | KAU | कौ |
| 𑂭 | KHA | ख |
| 𑂮 | KHĀ | खा |
| 𑂯 | KHI | खि |

Figure 5: 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 | 𑌶 | 6 |
| 𑌷 | 2 | 𑌷 | 7 |
| 𑌸 | 3 | 𑌸 | 8 |
| 𑌹 | 4 | 𑌹 | 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 6: 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 |
| त्र | त्र, त्र | 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 7: 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 8: 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 | ७ | TA | त |
| | ७ | BHA | भ |
| SET IV | ३ | ŃA | ड |
| | ३ | DA | द |
| SET V | ७ | PA | प |
| | ७ | 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 9: 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 | 𑂀 & 𑂁 & 𑂂 | | 𑂃 |
| ā | 𑂀𑂃 & 𑂁𑂃 & 𑂂𑂃 | 𑂄 | 𑂃𑂄 |
| i | 𑂅 & 𑂆 | 𑂇 & 𑂈 & 𑂉 | 𑂃𑂇 & 𑂃𑂈 & 𑂃𑂉 |
| ī | 𑂅𑂃 & 𑂆𑂃 | 𑂇𑂃 | 𑂃𑂇𑂃 |
| u | 𑂊 & 𑂋 | 𑂌 | 𑂃𑂌 |
| ū | 𑂊𑂃 & 𑂋𑂃 | 𑂌𑂃 | 𑂃𑂌𑂃 |
| r | 𑂍 (=“r̄”) | 𑂎 | 𑂃𑂎 |
| r̄ | 𑂍 (=“r̄̄”) | 𑂎̄ | 𑂃𑂎̄ |
| l | (not documented) | 𑂏 | 𑂃𑂏 |
| l̄ | (not documented) | | |
| e | 𑂐 & 𑂑 | 𑂒 | 𑂃𑂒 |
| ai | 𑂐𑂃 & 𑂑𑂃 | 𑂒𑂃 | 𑂃𑂒𑂃 |
| o | 𑂓 & 𑂔 | 𑂕 | 𑂃𑂕 |
| au | 𑂓𑂃 | 𑂕𑂃 | 𑂃𑂕𑂃 |

Figure 10: Distinctive features of Nandinagari (from Grünendahl 2001: 201).

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APPENDIX

*Consonants: Velar**Retroflex*

| | | | |
|-----|-------------------|-----|---------------------|
| ka | क | ṭa | ट & ट & ट |
| kha | ख & ख | ṭha | ठ & ठ & ठ (cf. ḍha) |
| ga | ग & ग & ग & ग & ग | ḍa | ड & ड |
| gha | घ & घ | ḍha | ढ |
| ṅa* | ङ | ṅa | ण |

*Palatal**Dental*

| | | | |
|------|----------------------|-----|-----------|
| ca | च & च | ta | त |
| cha | छ & छ & छ (cf. ccha) | tha | थ & थ |
| ja | ज & ज | da | द & द |
| jha† | झ | dha | ढ & ढ & ढ |
| ña | (not documented) | na | न |

* interpolated from conjuncts

† to be distinguished from ञ ru

Figure 11: Distinctive features of Nandinagari (from Grünendahl 2001: 202).

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| <i>Labial</i> | | <i>Sibilants</i> | |
|------------------|-------------------|------------------|---------|
| pa | प & प | śa | री & री |
| pha | फ़ & फ़ | ṣa | ष & ष |
| ba | ब | sa | री & री |
| bha | त & त | | |
| ma | म | | |
| <i>Sonorants</i> | | <i>Other</i> | |
| ya | य & य & प & प & ण | ha | रु & रु |
| ra | र | la | ल |
| la | ल & ल | | |
| va | व & व | | |

Figure 12: Distinctive features of Nandinagari (from Grünendahl 2001: 203).

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APPENDIX

Additional Graphs○ *-ṃ (anusvāra)*ॐ *-ñ (anunāsika)*ः & ॆ *-ḥ (visarga)*ॐ *avagraha*◻ & ◻ *virāma, e.g. -ṭ ॢ -t ॣ & ।*◻ & ◻ & ◻ *Vedic accents (preceding accented syllables)*ॐ *om**Numerals (cf. pp. 138, 180)*

| | | | | |
|-------|-------|---------------|-------|-------|
| ○ | ॑ | ॒ & ॒ & ॑ & ॑ | क़ | ख़ & ख़ |
| 1 | 2 | 3 | 4 | 5 |
| ॆ & ॆ | ॑ & ॑ | √ & √ | ॆ & ॆ | ○ |
| 6 | 7 | 8 | 9 | 0 |

Figure 13: Distinctive features of Nandinagari (from Grünendahl 2001: 204).

Conjuncts

| | | | | |
|-------|---|-----|-------|------------------------------------|
| kka | क | | gga | ग |
| kca | क | | gna | ग |
| кта | क | क | gya | ग |
| ktyā | क | | gra | ग |
| ktra | क | क | gla | ग |
| ktva | क | क | | |
| ktha | क | | ghna | ग |
| kya | क | क | | |
| kra | क | | ñ- | <i>usually appears as anusvāra</i> |
| kla | क | क | ñmu | क |
| kṣa | क | kṣū | | |
| kṣma | क | | cca | क |
| kṣmyā | क | | ccha | क (cf. cha) क |
| kṣya | क | | cchṛ | क (also for cchru) |
| | | | cchva | क |
| khya | क | | cya | क |

Figure 14: Distinctive features of Nandinagari (from Grünendahl 2001: 205).

| | | | | |
|------|-----------|----------|------|-----------|
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| cyu | चु | | dhva | धु |
| cra | च | | | |
| | | | ṅya | ण्य ण |
| jjha | ज्झ | | ṅva | ण्व |
| jña | ञ | | | |
| jñya | ञ्य | | tka | क क्तु कु |
| jya | ज ज्ञ | | tta | त त्त |
| jyo | ज्य ज्ञ्य | | tna | न |
| jva | ज्व | | tpa | प प्त |
| | | | tpra | प्प |
| | | | tpha | प्फ |
| | | | tma | म |
| ṭya | ट्ट | | tmya | ट्ट्य |
| ṭva | टु | | tya | ट्य |
| | | | tra | त्र |
| ḍya | ड्य | | trya | ट्र्य |

Figure 15: Distinctive features of Nandinagari (from Grünendahl 2001: 206).

| | | NANDINAGARI | | | |
|------|---------|-------------|-----|------|--------------|
| tva | व | | | dhva | ध्व ध |
| t | त | त् | त् | | |
| tsa | त्सा | त्सा | | | |
| tsya | त्स्या | | | nta | न्त न्त |
| tsva | त्सव | | | nma | न्म |
| | | | | nya | न्य न्यु न्य |
| dga | ङ | | | nva | न्व |
| dda | ङ् | द्दु | ङ्ग | | |
| ddha | ङ्ह | छ | झ | pta | प्त |
| dba | ड | | | pna | प्न |
| dbra | ड्र | | | pno | प्नो प्नो |
| dma | डम | | | pra | प्र प |
| dya | ड्य | ड्यु | ड्य | | |
| dra | ड्र | ड्र | | bda | ब्द |
| dva | ड्व | | | bra | ब्र |
| | | | | | |
| dhya | ध्या धय | | | bhya | भ्य भ्य |

Figure 16: Distinctive features of Nandinagari (from Grünendahl 2001: 207).

| 208 | | APPENDIX | |
|------|-----|----------|-----|
| bhra | 𑂔 | vya | 𑂗 |
| | | vra | 𑂘 |
| mpa | 𑂙 | | |
| mya | 𑂚 | śca | 𑂛 |
| mra | 𑂛 | śna | 𑂜 |
| | | śya | 𑂝 |
| yya | 𑂞 𑂟 | śra | 𑂞 |
| | | śrī | 𑂟 𑂠 |
| rda | 𑂡 | śva | 𑂡 |
| rma | 𑂢 | | |
| rya | 𑂣 | ṣka | 𑂤 𑂥 |
| rṣa | 𑂦 | ṣkr | 𑂦 |
| rṣe | 𑂧 | ṣta | 𑂧 |
| rṣya | 𑂨 | ṣtra | 𑂨 |
| | | ṣtva | 𑂩 𑂪 |
| lkya | 𑂫 | ṣtha | 𑂫 𑂬 |

Figure 17: Distinctive features of Nandinagari (from Grünendahl 2001: 208).

| NANDINAGARI | | | | | |
|-------------|----|----|-----|----|----|
| ṣṇa | ꣳ | | sma | ꣳꣳ | ꣳꣳ |
| ṣṇu | ꣳꣳ | | sya | ꣳꣳ | ꣳꣳ |
| ṣṇva | ꣳꣳ | | sra | ꣳꣳ | ꣳꣳ |
| ṣma | ꣳꣳ | ꣳꣳ | sva | ꣳꣳ | ꣳꣳ |
| ṣya | ꣳꣳ | | | | |
| ṣva | ꣳꣳ | | hna | ꣳꣳ | |
| | | | hma | ꣳꣳ | |
| ska | ꣳꣳ | ꣳꣳ | hya | ꣳꣳ | |
| sta | ꣳꣳ | ꣳꣳ | hla | ꣳꣳ | |
| stra | ꣳꣳ | ꣳꣳ | hva | ꣳꣳ | |
| stha | ꣳꣳ | ꣳꣳ | | | ꣳꣳ |

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Figure 18: Distinctive features of Nandinagari (from Grünendahl 2001: 209).