# Hariphunchai Tai Tham Font Project
## โครงการฟอนต์อักษรธรรมล้านนา "หริภุญชัย"

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## Introduction

For centuries throughout the northern regions of Southeast Asia in the Xishuangbanna (西双版纳 สิบสองปันนา) region of Yunnan in China, in the Lanna (ล้านนา) region of Northern Thailand, in the Shan state (รัฐ ฉาน) of Myanmar around the city of Kengtung (เชียงตุง) and in Laos, the Tai Tham script (อักษรธรรมล้านนา หรือ ตั๋วเมือง) has been used extensively to preserve important religious and cultural texts. In Buddhist monastaries throughout the region, texts in Sanskrit, Pali, and local Tai (傣 ไท) languages were traditionally written on palm leaf manuscripts (贝叶经 คัมภีร์ใบลาน) or folded *sa* paper (พับสา).

While scripts such as Central Thai and Laotian have replaced Tai Tham in the regions of Thailand and Laos where Tai Tham was traditionally used, Tai Tham remains the only script of the Tai Kuen (ไท เขิน) people in the Shan state of Myanmar, and continues to be taught also in monastaries by the Tai Lue (傣仂 ไทลื้อ) people in the Xishuangbanna region in China.

In the current Digital Age, there is renewed interest in using the Tai Tham script to preserve the cultural heritage of the past and to educate the youth of a new generation. Historically, only monks and a few other educated people had access to Tai Tham texts. Now digital technology, the internet, and the continuing development of Unicode as the worldwide standard for the exchange of textual information are beginning to make it possible for many more people to access documents written in Tai Tham.

Notably, l'École française d'Extrême-Orient (EFEO,

http://www.efeo.fr) in Paris, in cooperation with the Princess Maha Chakri Sirindhorn Anthropology Centre in Bangkok (ศูนย์มานุษยวิทยาสิรินธร, http://www.sac.or.th ) have made available online a collection of *Lanna* palm leaf manuscript chronicles, traditional stories and Buddhist narratives called *tamnan* (ตำนาน, http://www.efeo.fr/lanna_manuscripts/).  Another notable example is the Digital Library of Lao Manuscripts (ຫໍສະໝຸດດີຈີຕອລຫັຽສີໃບລານລາວ, http://laomanuscripts.net), an online collaboration of the National Library of Laos (ຫໍສະໝຸດແຫ່ງຊາດລາວ), the University of Passau and the Staatsbibliothek zu Berlin Preußischer Kulturbesitz in Germany.

However much work remains before people can conveniently use Tai Tham on computers and on the internet. High-quality Unicode fonts, keyboard and input methods, and software capable of handling Tai Tham are required.  For example, currently neither the EFEO project nor the Lao Manuscript project allow the user to search directly using Tai Tham.

## Goal

The goal of the Hariphunchai Tai Tham Font Project is to create a freely available, professional-quality Unicode Tai Tham font licensed under the terms of the Open Font License (OFL, http://scripts.sil.org/OFL).

## Design of the font

In recent years there has been renewed interest in Tai Tham, but Tai Tham is a very complex script and finding high-quality fonts and software for typesetting Tai Tham correctly remains a real problem.

Faced with these problems, authors and publishers of some books printed in Thailand have simply incorporated hand-written Tai Tham passages rather than attempt typesetting. Other books have used non-Unicode digital fonts, but these fonts often exhibit poor legibility or "crowding" for certain combinations of symbols that occur in practice (*figure 1*).
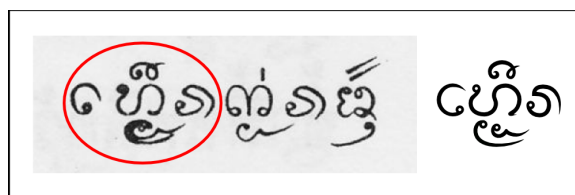
*Figure 1. The image on the left from a book published in Thailand illustrates a common problem of glyph "crowding" in the digitally typeset Tai Tham word "เหมือน". A more legible version is shown on the right.*

Glyph crowding is not a problem when Tai Tham is written by hand because the scribe can dynamically adjust the spacing and size of letters as he writes to achieve legibility and pleasing results.

Until quite recently, Tai Tham was used almost exclusively to write manuscripts by hand. As a result, there does not exist a long-established typographic tradition that modern type designers can turn to when attempting to design fonts for Tai Tham. This situation is much different than with scripts such as Latin which has a long history of typographic design.

As Tai Tham typography is not yet fully developed in countries like Thailand and Laos, it is especially important to turn to manuscript sources for insight and inspiration to guide font design. While this is a fruitful approach, one needs to pay attention to other classes of problems that accompany hand-written manuscripts.

First, it is not enough to examine only a few manuscripts. A single manuscript is often the work of a single scribe or, at most, of two or three scribes or "hands" who completed the manuscript. Each scribe has his own idiosyncracies and style. If we pay too close attention to the idiosyncratic variations of single hands, we may lose sight of the commonalities that are present among all hands.

For a project such as *Hariphunchai*, what we really want to find are the commonalities that are shared by all scribes. We want to capture those common features of shape, styling, structure, and spacing into a modern font that all readers of Tai Tham will immediately recognize as being clean, legible, and pleasing to the eye.

But this is easier said than done. Prior to the modern era, cultural communication and transmission on a regional scale occurred much less rapidly than it does now. Regional isolation fostered the development of regional variations in the Tai Tham script (*figure 2*).
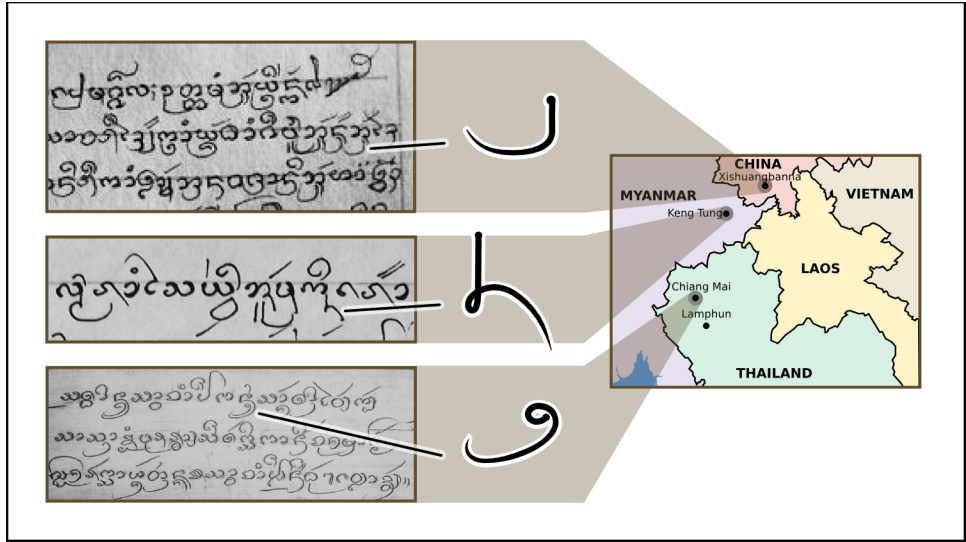


*Figure 2. Regional variation in the shape of subjoined na ( ᩁᩤ) is evident in manuscripts from Xishuangbanna (Yunnan Province, China), Keng Tung (Shan State, Myanmar), and Chiangmai (Thailand).*

For the *Hariphunchai* Tai Tham Unicode Font project, I have looked at palm leaf manuscripts as the ultimate authority for inspiration and guidance regarding the design of letterforms in the font. I have endeavored to create clean and simple letterforms close to the *Lanna* style that are easy to read both on screen and in print. In addition to striving to create elegant individual letterforms, when I have noticed commonly-repeated conventions for writing two or more characters together or in sequence in the manuscripts, I have done my best to design ligated (joined) forms that I hope capture the spirit and beautiful letterforms of the palm leaf manuscript scribes (*figure 3*).
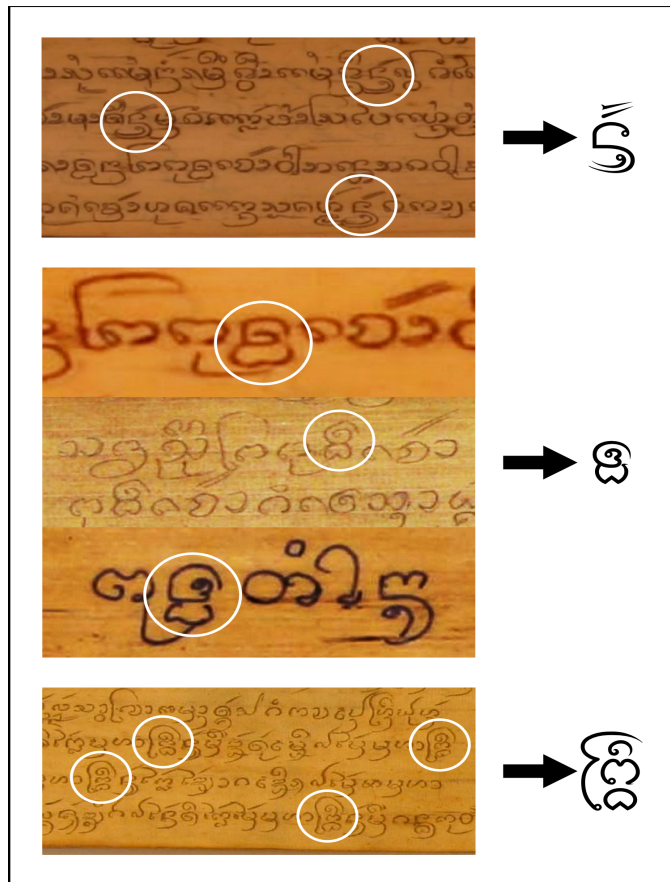
*Figure 3. A few ligated forms in the Hariphunchai font (right) created in the spirit of the Tai Tham calligraphic tradition.*

# Source Files & Availability

All of the source files for the Hariphunchai Tai Tham Unicode Font are available on Sourceforge at http://sourceforge.net/projects/hariphunchai/.

Hariphunchai will become freely available to everyone as part of Google's Font Initiative.   Look on http://www.google.com/fonts/earlyaccess for early access to the font, and on http://www.google.com/fonts for regular access.

# Consonants

Tai Tham consonants in the Hariphunchai font are displayed in the table below. Equivalent consonants in Devanagari, Lao, Tai Kuen, and Central Thai scripts are also shown.

## Tai Tham (Lanna) Consonants
## พยัญชนะล้านนา

*with Devanagari, Lao, Tai Khuen, and Central Thai equivalents*



# Character Charts

Tai Tham characters are arranged by Unicode value in the following charts. Sample words are included showing use of base consonants and subjoined consonants. Tai Tham shaping was done using Harfbuzz `hb-view` version 0.9.25 ([http://cgit.freedesktop.org/harfbuzz/](http://cgit.freedesktop.org/harfbuzz/)).

| 1A2x | ตัว<br>อักษร<br>CHARACTER | ตัวอย่าง<br>EXAMPLES | ตัวอย่างที่ใช้ ตีน ฐาน หรือหาง<br>ของพยัญชนะ<br>EXAMPLES WITH SUBJOINED FORM |
|---|---|---|---|
| U+1A20 | ၮ | ကူၵ | ၹၮ |
| U+1A21 | ၡ | ၡ� | ၕ္ၡၟ |
| U+1A22 | ၢ | ၢဴ္ခႝ | [ၮ] |
| U+1A23 | ၣ | ၣ္- | ၣ္ၨၣ |
| U+1A24 | ၤ | ၤ္ | [ၮ] |
| U+1A25 | ၥ | ၸ္ၥၾ္ | ၸၸ |
| U+1A26 | ၦ | ၦၥ ၾ္ၦ | ၽၥၟ |
| U+1A27 | ၧ | ၧ္ဴ္ | ၸၳ္ၧၟ္ |
| U+1A28 | ၨ | ၨၟ | ၹၟၡၥ |
| U+1A29 | ၩ | ၩၟ | ၾ္ၧၩ |
| U+1A2A | ၪ | ၪၟ္ | [ၮ]<br>ၪ္ |
| U+1A2B | ၫ | ၫၥၥၭ | [ၮ]<br>ၫ္ |
| U+1A2C | ၬ | ၬၥၡ္ | ၥ္ၬၥ |
| U+1A2D | ၭ | ၭၳၮၥ | ၾ္ၭၟ္ |
| U+1A2E | ၮ | ၮၥၭ ၤၮၪၟ | [ၮ]<br>ၮ္ |
| U+1A2F | ၯ | ၯၟ | ၮၡ ၤ္ၯၡၥ |

| 1A3x | ตัว<br>อักษร<br>CHARACTER | ตัวอย่าง<br>EXAMPLES | ตัวอย่างที่ใช้ ตีน ฐาน หรือหาง<br>ของพยัญชนะ<br>EXAMPLES WITH SUBJOINED FORM |
|---|---|---|---|
| U+1A30 | ᨰ | ᨰ᩠ᨧ᩠ᨩ | ᨧ᩠ᨩᨮ |
| U+1A31 | ᨱ | ᨧᨲ | ᨰᨲ |
| U+1A32 | ᨲ | ᨲ�᩶ | ᨲᨴ |
| U+1A33 | ᨳ | ᨧᨳ | ᨳᨳ |
| U+1A34 | ᨴ | ᨴ | ᨴ |
| U+1A35 | ᨵ | ᨷᨵ | ᨵᨵ  ᨵᨷ |
| U+1A36 | ᨶ | ᨶ᩠ᨵ᩶  ᨶ᩶ | ᨶ᩠ᨵ  ᨶ᩶ |
| U+1A37 | ᨷ | ᨷ᩠ᨶ᩶ | ᨧᨷ᩶ |
| U+1A38 | ᨸ | ᨧᨸᩩ | [ᨸ᩠ᨿ] |
| U+1A39 | ᨹ | ᨹ᩶ | ᨷᨹᩣ |
| U+1A3A | ᨺ | ᨧᨺᩳ | [ᨺ᩠ᨿ] |
| U+1A3B | ᨻ | ᨻ᩶ | ᩉᨻ |
| U+1A3C | ᨼ | ᨶᨼ | ᨼ᩠ᨿᩴ  ᨠᨿ�ᩴ |
| U+1A3D | ᨽ | ᨧᨽᩣ | ᨠᨽᩣ |
| U+1A3E | ᨾ | ᨾ᩠ᨿ-ᩈ | ᨲᩩ |
| U+1A3F | ᨿ | ᨿ᩠ᨾ | ᩅ᩠ᨿ |

| 1A4x | ตัวอักษร<br>CHARACTER | ตัวอย่าง<br>EXAMPLES | ตัวอย่างที่ใช้ ตีน ฐาน หรือหาง<br>ของพยัญชนะ<br>EXAMPLES WITH SUBJOINED FORM |
|---|---|---|---|
| U+1A40 | ᩀ | ᩀᩣᩴ | [ ᩀ ] |
| U+1A41 | ᩁ | � ᩁᩣ | ᩁ |
| U+1A42 | ᩂ | ᩃᩂ ᩂᨠᩅ | |
| U+1A43 | ᩃ | ᩃᩬᩳ | ᩃ |
| U+1A44 | ᩄ | ᩄ | |
| U+1A45 | ᩅ | ᩅᩢ | ᩰᩅᩢ |
| U+1A46 | ᩆ | ᩆ�ᩥ | ᨻᩣᨠᩅ |
| U+1A47 | ᩇ | ᩈᩆᩦ | ᩅᩩᩇᩣ |
| U+1A48 | ᩈ | ᩈᩣᨣ | ᩅᩩᩈ |
| U+1A49 | ᩉ | ᩉᩩ | ᩈᩥᩉᩬ |
| U+1A4A | ᩊ | ᨠᩥᩊᩣ | [ ᩊ ] |
| U+1A4B | ᩋ | ᩋᩬᩴ | [ ᩋ ] ᩮᩛᩬᨠᩁᩢᨿ |
| U+1A4C | ᩌ | ᨠᩮᩌᩢᩢ� | [ ᩌ ] |
| U+1A4D | ᩍ | ᩍᨲᩢᩈᩮᩣ ᩍᨬᩳᩥ | |
| U+1A4E | ᩎ | ᩎᩈᩣ | |
| U+1A4F | ᩏ | ᩏᨸᩢᩊᩣᨿ | |

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| 1A5x | ตัว<br>อักษร<br>CHARACTER | ตัวอย่าง<br>EXAMPLES | ตัวอย่างที่ใช้ ตีน ฐาน หรือหาง<br>ของพยัญชนะ<br>EXAMPLES WITH SUBJOINED FORM |
|---|---|---|---|
| U+1A50 | ᩐ | ᩐ᩠ᩣ ᩐ᩠ᨦᩱ | |
| U+1A51 | ᩑ | ᩑᨸ᩠ᨻ᩠ᨿᩦ ᩑᨠᨲᩰᩅᩡᩴ | |
| U+1A52 | ᩒ | ᩒ | |
| U+1A53 | ᩓ | ᩓᩖ | [ᩔ] |
| U+1A54 | ᩔ | ᩔᩅᩔ᩠ᨬᩦ | [ᩔ] |
| U+1A55 | ᩕ | ᩕᩣ ᩕᩖᩣᨩᩁᩦ | |
| U+1A56 | ᩖ | ᩖᩯ ᩖᩯ ᩖᨩ | |
| U+1A57 | ᩗ | ᩗ | |
| U+1A58 | ᩘ | ᩈᩘᩥᩈᩬᩣ ᩈᩘᩥᨣᩘ� | |
| U+1A59 | ᩙ | ᩙᩥᨲᩖᩥ ᩅᩘᩖᩔᨠᨿᩣᨣᩘᩥ | |
| U+1A5A | ᩚ | ᨠᨻᩚ | |
| U+1A5B | ᩛ | ᩚᨦᩗᩣ᩠ᩲ ᩔᩣᩚᩫ᩠ | |
| U+1A5C | ᩜ | ᩜ | |
| U+1A5D | ᩝ | ᩝ | |
| U+1A5E | ᩞ | ᩒᩘᨠᩞᩯ ᩢᩚᩯᩮ | |
| U+1A5F | □ | | |

| 1A6x | ตัว<br>อักษร<br>CHARACTER | ตัวอย่าง<br>EXAMPLES | ตัวอย่างที่ใช้ ตีน ฐาน หรือหาง<br>ของพยัญชนะ<br>EXAMPLES WITH SUBJOINED FORM |
|---|---|---|---|
| U+1A60 | ◌ͅ+ | ᨠ + ◌ͅ + ᨠ = ᨠ᩠ᨠ | ᨠ᩠ᨠ ᨠ᩠ᨣ ᨠ᩠ᨮ ᨠ᩠ᨣ ᨠ᩠ᨬᩉ |
| U+1A61 | ᩡ | ᨣᩮᩧ᩠ᨦᩡ | |
| U+1A62 | ᩢ | ᩊᩢᨧᩮᩢ᩠ᨾ | |
| U+1A63 | ᩣ | ᨠᩣ ᨦᩣ | |
| U+1A64 | ᩤ | ᨷᩤ ᨣᩤᩢᨠᩤ | |
| U+1A65 | ᩥ | ᨷᩥᨲ᩠ᨲᩣ ᩉᩥᨻᨧᩩ | |
| U+1A66 | ᩦ | ᩊᩦᩢ ᨣᩮᩦᩡ | |
| U+1A67 | ᩧ | ᨦᩧᩢ᩠ᨦ | |
| U+1A68 | ᩨ | ᨣᩮᩨ᩠ᨾ ᨲᩮᩨᩢ᩠ᩃ | |
| U+1A69 | ᩩ | ᩃᩩᨠ | |
| U+1A6A | ᩪ | ᨳᩪᨠᨣᩮᩪ | |
| U+1A6B | ᩫ | ᨠᩫ᩠ᩃᩉᩢ᩠ᨿ | |
| U+1A6C | ᩬ | ᨣᩮᩬᩢᨠ | |
| U+1A6D | ᩭ | ᨣᩭ | |
| U+1A6E | ᩮ | ᨷᩮᨬ | |
| U+1A6F | ᩯ | ᨣᩯ᩠ᨾᩬᩢᨦ᩠ᨿᨠ | |

| 1A7× | ตัว<br>อักษร<br>CHARACTER | ตัวอย่าง<br>EXAMPLES | ตัวอย่างที่ใช้ ตีน ฐาน หรือหาง<br>ของพยัญชนะ<br>EXAMPLES WITH SUBJOINED FORM |
|---|---|---|---|
| U+1A70 | ᩰ | ᨶᩖᩴ᩻ ᨶᩖ᩵ᩴ | |
| U+1A71 | ᩱ | ᩱᨷᩃᩩ | |
| U+1A72 | ᩲ | ᩲᨠᩮᩲᦖ | |
| U+1A73 | ᩳ | ᨶᩴᩢᩛᩣ᩶ | |
| U+1A74 | ᩴ | ᨦᩴᩢ᩺ | |
| U+1A75 | ᩵ | ᨳ᩠ᩣᩁᩡ | |
| U+1A76 | ᩶ | ᩖᩩ᩶ ᨷᩢ᩺ᨧᩩᩢ᩺ | |
| U+1A77 | ᩷ | ᩖᩩᩢ᩻ | |
| U+1A78 | ᩸ | | |
| U+1A79 | ᩹ | | |
| U+1A7A | ᩺ | ᨲᩫ᩠ᨮᩰᩢ᩺ | |
| U+1A7B | ᩻ | ᨬᩣᩢ᩻ | |
| U+1A7C | ᩼ | | |
| U+1A7D | □ | | |
| U+1A7E | □ | | |
| U+1A7F | ᩿ | ᨲ᩿ | |

| 1A8x | ตัว<br>อักษร<br>CHARACTER | ตัวอย่าง<br>EXAMPLES | ตัวอย่างที่ใช้ ตีน ฐาน หรือหาง<br>ของพยัญชนะ<br>EXAMPLES WITH SUBJOINED FORM |
|---|---|---|---|
| U+1A80 | ꪀ | | |
| U+1A81 | ꪁ | | |
| U+1A82 | ꪂ | | |
| U+1A83 | ꪃ | | |
| U+1A84 | ꪄ | | |
| U+1A85 | ꪅ | | |
| U+1A86 | ꪆ | | |
| U+1A87 | ꪇ | | |
| U+1A88 | ꪈ | | |
| U+1A89 | ꪉ | | |
| U+1A8A | □ | | |
| U+1A8B | □ | | |
| U+1A8C | □ | | |
| U+1A8D | □ | | |
| U+1A8E | □ | | |
| U+1A8F | □ | | |

| 1A9x | ตัว<br>อักษร<br>CHARACTER | ตัวอย่าง<br>EXAMPLES | ตัวอย่างที่ใช้ ตีน ฐาน หรือหาง<br>ของพยัญชนะ<br>EXAMPLES WITH SUBJOINED FORM |
|---|---|---|---|
| U+1A90 | ๐ | | |
| U+1A91 | ๑ | | |
| U+1A92 | ๒ | | |
| U+1A93 | ๓ | | |
| U+1A94 | ๔ | | |
| U+1A95 | ๕ | | |
| U+1A96 | ๖ | | |
| U+1A97 | ๗ | | |
| U+1A98 | ๘ | | |
| U+1A99 | ๙ | | |
| U+1A9A | □ | | |
| U+1A9B | □ | | |
| U+1A9C | □ | | |
| U+1A9D | □ | | |
| U+1A9E | □ | | |
| U+1A9F | □ | | |

| 1AAx | ตัว<br>อักษร<br>CHARACTER | ตัวอย่าง<br>EXAMPLES | ตัวอย่างที่ใช้ ตีน ฐาน หรือหาง<br>ของพยัญชนะ<br>EXAMPLES WITH SUBJOINED FORM |
|---|---|---|---|
| U+1AA0 | ⊕ | | |
| U+1AA1 | ⊕ | | |
| U+1AA2 | ᪂ | | |
| U+1AA3 | ᪃ | | |
| U+1AA4 | ᪄ | | |
| U+1AA5 | ᪅ | | |
| U+1AA6 | ᪆ | | |
| U+1AA7 | ᪇ | | |
| U+1AA8 | ᪈ | | |
| U+1AA9 | ᪉ | | |
| U+1AAA | ᪊ | | |
| U+1AAB | ᪋ | | |
| U+1AAC | ᪌ | | |
| U+1AAD | ᪭ | | |
| U+1AAE | □ | | |
| U+1AAF | □ | | |

# Samples

Excerpt from
**เชื้อเครือเจ้าแสนหวีสิบสองพันนา**
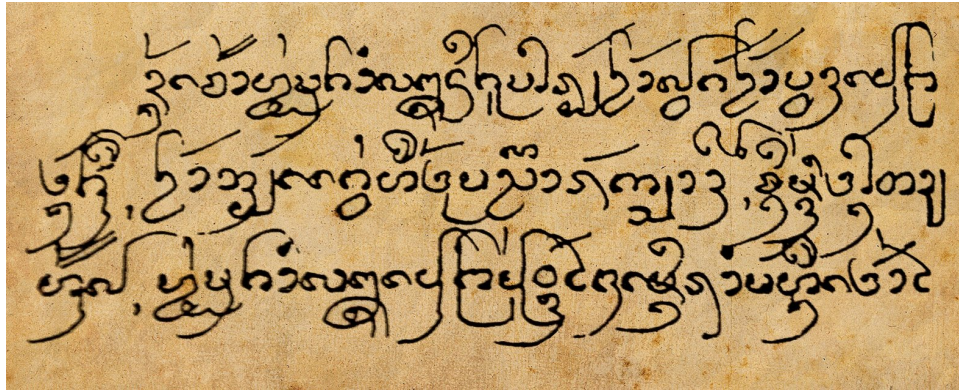


ᨣᩤᩴᨣᩤᩴᨤᩴᨾᨠᩴᩅᩅᩃᨯᩫᨠᩢ᩠ᨦᨠᩩᨸᩃ᩠ᨬᩰᩅᩃᩩᩢ᩠ᨠᩥᩅᨷᩩᨱᨻᩰᨹ
ᨵᩢᩴ ᩮᩅᩡᩮᨣᩢᩴᩉᩥᩪᨷᨱᩣᩅᩢᨮᩩᩣᨣᩤᩴ ᨣᩤᩴᨾᩪᩢ᩠ᨦᩃᩩᩢᩣᩅ
ᩁᩢᩴᩃᩥ ᨤᩴᨾᨠᩴᩅᩃᨯᩫᩮᨷᩩᨮᨷᩩᩢᩪᩃᩮᨤᨾᩪᩢᩴᨩᩴᨷᩉᩢᩴᩮᨮᩅᨤ

ดั่งเจ้าหม่อมตำฎุนิตูบารับเอาแล้ว คัเอาบวดเปนพร
ทังคืน เอาอับแคว่หี้ทุปญฺญารกฺสาดี ๆ จิงมดทางตาย
หั้นแล หม่อมตำฎุเปนพรอยู่วัดไชเมิงรำบัหึงเท่าได

*Figure 4. Excerpt from เชื้อเครือเจ้าแสนหวีสิบสองพันนา, a book in Tai
Lue containing historical accounts of the Xishuangbanna region
(edited by Tao Kwang Seng & Yan Han (Ai-Kham), Silkworm Books,
Bangkok, ISBN 974-7551-52-7). Top: Excerpt from the manuscript folio.
Middle: Typeset using the Hariphunchai Tai Tham Unicode font.
Bottom: Transcription into Central Thai script.*

## ฆะ ระฆังย่ำเสียงดัง



## ผะ ผาชั้นช่อคีรี
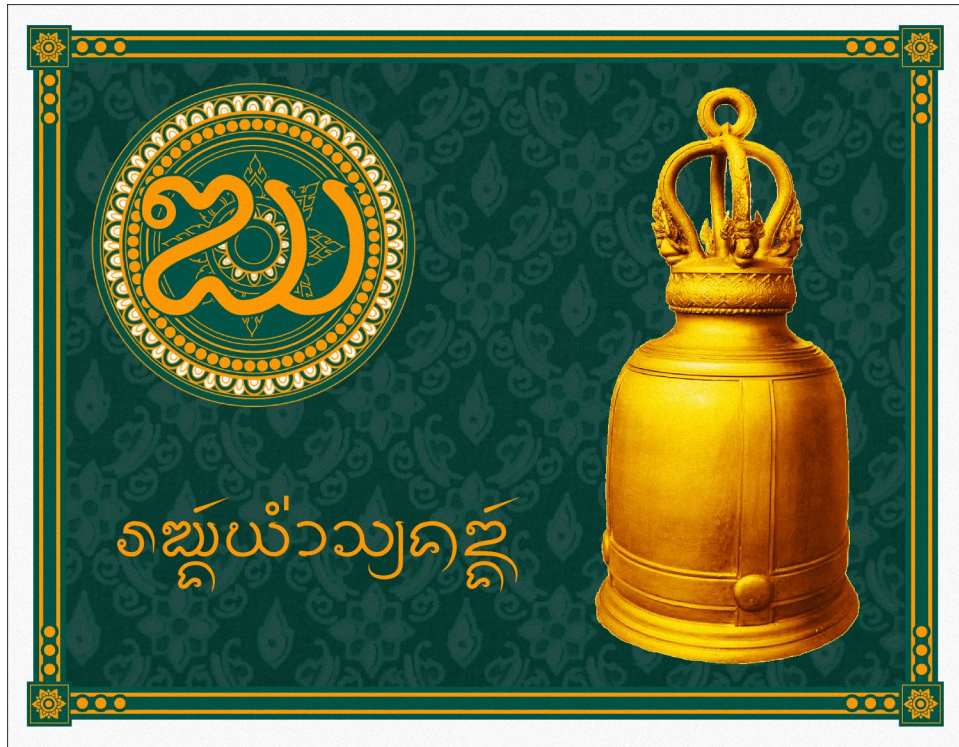


*Figure 5 & 6. Letters kha (ฆะ) and pha (ผะ).*

ยะ  ยักษ์นั่งร้องกินคน



ระ  เรือเทียวหนแม่น้ำ



*Figures 7 & 8. Letters ya (ยะۛ) and ra (ระۛ).*

*Figure 9. Hariphunchai font waterfall. This image was prepared with Harfbuzz* `hb-view` *version 0.9.25 using* `--output-format=svg` *and* `--font-size=<number shown on the left side>.`

# Aknowledgements

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Bangkok, Thailand. ISBN 974-8359-03-4.

# Online Resources

**Digital Library of Lao Manuscripts -**
ຫໍສະໝຸດດີຈີຕອລຫັນສືໃບລານລາວ:

http://laomanuscripts.net/

**EFEO Lanna Manuscripts — คัมภีร์ล้านนา:**

http://www.efeo.fr/lanna_manuscripts/

**Google Font Initiative:**

http://www.google.com/fonts

http://www.google.com/fonts/earlyaccess

**Harfbuzz text shaping engine:**

http://www.freedesktop.org/wiki/Software/HarfBuzz/

http://cgit.freedesktop.org/harfbuzz/

**Hariphunchai Tai Tham Font Project:**

http://unifont.org/hariphunchai/

http://sourceforge.net/projects/hariphunchai/

**Open Font License (OFL):**

http://scripts.sil.org/OFL

**Princess Maha Chakri Sirindhorn Anthropology Centre**
ศูนย์มานุษยวิทยาสิรินธร:

http://www.sac.or.th