

Title: Preliminary Proposal to encode the Yo Lai Tay Script
Author: Viet Khoi Nguyen
Cong Danh Sam
Frank van de Kasteelen

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1. Introduction

The *Tai Yo* language (ISO 639-3: **tyj**), usually mentioned as *Tay Dọ* or *Thái Yo* in Vietnamese, is one of the Tai languages spoken in some districts of two provinces Nghệ An and Thanh Hóa, Vietnam. There are also some Tai Yo varieties spoken in Laos by communities known as Tai Maen and Tai Pao. The *Tai Yo* language belongs to the Southwestern Tai group which includes Siamese (Central Thai), Lao, Tai Dam, Tai Don, and its geographically-related Tai Daeng and Tai Meuyay.

Native speakers of the Tai Yo language are called Tai Yo people, a subgroup of Thái ethnic group under Vietnam's classification. The Tai Yo people in fact have some other ethnonyms such as Tay Mương, Tay Hàng Tổng, and Tay Chiềng/Xiềng (only in Nghệ An). An estimated number of 292.000 native Tai Yo speakers (2019) in Nghệ An and Thanh Hóa is reported¹.

Lai Tay, meaning the script of Tay, is one of the two Brahmic scripts used to write the Tai Yo language. Since Tay or Tai is the endonym of various Tai ethnic groups, the script is hereafter called *Yo Lai Tay*. The other script for Tai Yo is known as *Lai Pao*.

2. Usage

The *Yo Lai Tay* script was traditionally used by some Tai Yo communities in Thanh Hóa province (Thường Xuân and Như Xuân districts, formerly belonging to an upland district called *Châu Thường Xuân*) and in Nghệ An province (Quê Phong, Quỳnh Châu, Quỳnh Hợp, Tân Kỳ districts, belonging to a former prefecture called *Phủ Quỳnh Châu*). Nowadays, in Nghệ An province, *Yo Lai Tay* manuscripts are preserved in some personal collections and public places. Besides, teaching and learning activities of the *Yo Lai Tay* script are proceeding with the support of the local government and teachers.

3. Writing system

The *Yo Lai Tay* script remains relatively close to its neighboring scripts Thai, Lao and Tai Viet. There are three features, however, that structurally set it apart. The most obvious of these features is that *Yo Lai Tay* is written from top to bottom in columns running from right to left in a way similar to, and clearly influenced by, Chinese. In fact, many of the older manuscripts have their titles written in Chinese, and gloss uncommon words with the related Chinese character. The second differentiating feature is that in *Yo Lai Tay*, the vowel is always written in phonetic order, following the consonant it modifies. There are five signs which do occur to the right of their

¹ Sầm Công Danh (2021: 30)

associated consonant, but a vowel sign never precedes or circumvents its consonant as is common in other Tai scripts.

Thirdly, the *Yo Lai Tay* script remains a true abugida, meaning that a bare consonant is pronounced as a syllable with the inherent vowel <o>, [ɔ], where Thai and Lao, for example, now explicitly mark this vowel and have thus developed more into alphabets.

Fourthly, the *Tai Yo* language is tonal, similar to other Tai languages. However, like other traditional scripts for Southwestern Tai languages, the traditional *Yo Lai Tay* script does not use tone marks. Tone indicators are developed in modernized scripts of some Tai languages such as Lao, Black Tai, White Tai (sharing the Tai Viet Unicode block).

Especially the fact that vowels in general follow their associated consonant makes that the script is relatively straightforward to encode, requiring very little in terms of complex rendering. There are 29 consonants, of which only 8 occur in syllable final position. The script has 13 vowels, one of which is placed to the right of the consonant in an open syllable, but follows it in a closed syllable. There are 9 signs which represent a vowel-final consonant combination. Of those 4 are placed to the right of the consonant, one of which doubles as a medial glide [-w-]. Finally, there are 2 to 4 other signs, which represent iteration or whole words.

Throughout the proposal, whenever a single Tai Yo letter is shown embedded in Latin text, it is shown on its side in horizontal layout. Whenever characters are shown in a table, they are displayed in their vertical layout.

3.1. Consonants

Similar to other Tai languages in Vietnam, initial consonants of low class in *Yo Lai Tay* are equivalent to voiceless consonants in Proto-Tai and those of high class are equivalent to voiced consonants in Proto-Tai. In the phonology of the modern *Tai Yo* language, most low-high consonant phonemic pairs are merged into one pronunciation attached with different tones.

3.1.1. Initial consonants

The following consonants are used for the onset:

Name	Glyph	IPA	Tai Dam equivalent	Siamese equivalent	Sukhothai equivalent
LETTER LOW KO	ᨶ	/k/	ᨶ	ก	ᨶ
LETTER HIGH KO	ᨷ		ᨷ	ค	ᨷ
LETTER LOW KHO	ᨸ	/kʰ/	ᨸ	ข	ᨸ
LETTER HIGH KHO ²	ᨹ				

² Letter HIGH KHO is found only in modern teaching materials.

LETTER GO	ꨀ	/g/	ꨁ		
LETTER NGO	ꨂ	/ŋ/	ꨃ	ง	င
LETTER CO	ꨄ	/c/	ꨅ	จ	ဆ
LETTER LOW XO	ꨆ	/s/	ꨇ	ส	ဆ
LETTER HIGH XO	ꨈ		ꨉ	ซ	ဆ
LETTER LOW NYO	ꨊ	/ɲ/	ꨋ	ญ	ဇ
LETTER HIGH NYO	ꨌ				
LETTER DO	ꨎ	/d/	ꨏ	ด	တ
LETTER LOW TO	ꨐ	/t/	ꨑ?	ต/ต?	တ/တ?
LETTER HIGH TO	ꨒ		ꨓ?	ท/ธ?	တ/ธ?
LETTER THO	ꨔ	/tʰ/	ꨕ	ถ	တ
LETTER NO	ꨗ	/n/	ꨘ	น	န
LETTER BO	ꨙ	/b/	ꨚ	บ	ပ
LETTER LOW PO	ꨛ	/p/	ꨜ	ป	ပ
LETTER HIGH PO	ꨝ		ꨞ?	พ/ภ?	ပ/ပ?
LETTER PHO	ꨟ	/pʰ/, /f ³ /	(ꨠ)	ผ	မ
LETTER LOW FO	ꨡ	/f/	ꨢ	ฝ	ဖ
LETTER HIGH FO	ꨣ		ꨤ	ฟ	ဖ
LETTER MO	ꨥ	/m/	ꨦ	ม	မ
LETTER YO	ꨨ	/j/	ꨩ, ꨪ	ย	ယ
LETTER LO	ꨬ	/l/	ꨭ	ล	လ
LETTER VO	ꨮ	/v/	ꨯ	ว	ဝ
LETTER LOW HO	ꨱ	/h/	ꨲ	ห	ဟ
LETTER HIGH HO	ꨳ		ꨴ	ร	ဝ

³ Some dialects of Tai Yo language have no distinction between /pʰ/ and /f/, thus in these dialects, this LOW PH is used as LOW F.

LETTER QO	◌	/ʀ/	๑	๑	๑
LETTER LOW KVO	◌	/kw/	๑	๑	๑
LETTER HIGH KVO	◌		๑	๑	๑

The following initial consonants are missing in old manuscripts but are mentioned in one modern teaching material (**Figure 13**), which lists them but gives no examples of their use:

Name	Glyph	IPA	Alternative
LETTER SO	◌	/s/	◌
LETTER RO	◌	/z/	◌
LETTER TRO	◌	/t/	◌/◌

The phonemes these letter represent are not native in Tai Yo and found in loanwords from Vietnamese. However, phoneme /s/ is found in *Sâm* (a popular surname of Tai Yo people) and was frequently spelled with LETTER THO (◌) in some old materials (**Figure 14**). /z/ and /t/ sometimes merge into /d/ and /t/ respectively by some Tai Yo speakers. These phonemes are expected to be alternatively represented by DO as RO and HIGH or LOW TO as TRO, but as far as we know, these phonemes are not found in known old manuscripts. Since their actual use is still to be proven, they are for now not included in this proposal, but space will be left in the table for addition at a later time.

The letter HIGH KHO is similarly a recent addition to the *Yo Lai Tay* script. This letter is used for a phoneme native to Tai Yo, although it's quite rare. Since this glyph has no alternative, it has been included in this proposal. The fact that it's missing from the older manuscripts is mainly due to the fact that it's quite rare in and occurs in vocabulary not related to the mainly religious context of these manuscripts. Additionally, there are other rare phonemes native to Tai Yo, which are HIGH PHO, HIGH THO, HIGH CO, HIGH YO, and HIGH QO. Since they are missing in known manuscripts, they are not included in this proposal.

3.1.2. Final consonants

Codas are optional for most vowels and written at the end of the syllable. Only 8 following consonants, which are also in the above-mentioned initial consonant list, can be used for codas:

Name	Glyph	IPA
LETTER LOW NYO	◌	/-j/

LETTER NGO	◌	/-ŋ/
LETTER NO	◌	/-n/

LETTER MO		/-m/
Name	Glyph	IPA
LETTER VO		/-w/

LETTER LOW KO		/-k/
LETTER DO		/-t/
LETTER BO		/-p/

3.2. Vowels

3.2.1. Vowels with Zero initial

Like other Tai scripts, there is no independent vowel glyph. Like ə in Siamese Thai, *Yo Lai Tay* uses LETTER QO for the zero initial or glottal stop onset. While Siamese Thai uses ə for both the glottal stop onset and vowel /-ɔ:-/ in non-initial position, *Yo Lai Tay* uses a different glyph for vowel /-ɔ:-/: LETTER OO (○). When vowel OO /-ɔ:-/ is followed by no coda, the whole syllable is written as a standalone initial consonant.

The vowel UE /-i(:)-/ has two different forms. It occurs to the right of the consonant in open syllables, but sometimes follows it in closed syllables. This is comparable behavior to Thai SARA A and MAI HAN-AKAT, which have the same distribution. It therefore makes sense, like the Thai examples, to encode them separately and to not depend on complex behavior to choose the required form.

<i>mue</i>	<i>chue</i>	<i>puen</i>	<i>fuen</i>
‘hand’	‘character’	‘arrow’	‘firewood’

3.2.2. Vowel placement

The way vowels are written in *Yo Lai Tay* is different from other Tai scripts. Vowels succeed (are below) the initial consonant.

3.2.3. List of vowels

𑜆 (like 𑜈 in Tai Dam, 𑜇 in Siamese and 𑜇 in Sukhothai) is used in place of the initial consonant.





Succeeding vowels	Glyph	IPA	Tai Dam equivalent	Siamese equivalent	Sukhothai equivalent
LETTER AUE		/-ɔ(:)-/	𑜈	ໄ	𑜇

LETTER AA	၂၅	/-a:-/	ကၢ	ကာ	ၵၢ
LETTER I	၂၅	/-i(:)-/	ကိ	ကီ	ၵိ
LETTER U	၂၅	/-u(:)-/	ကု	ကူ	ၵု
LETTER IA	၂၅	/-iə-/	ကိ		
LETTER E	၂၅	/-e(:)-/	ကေ	ကေး	ၵေ
LETTER AE	၂၅	/-ɛ(:)-/	ကေ	ကေး	ၵေ
LETTER UEA	၂၅	/-iə-/			
LETTER UA	၂၅	/-uə-/	ကု		ၵု
LETTER O	၂၅	/-o(:)-/	ကေ	ကို	ၵေ
LETTER OO	၂၅	/-o:-/	ကဝ	ကဝ	ၵဝ
LETTER UE	၂၅	/-i(:)-/	ကိ	ကီ	ၵိ

3.2.4. Rime signs






Phonetically, vowel short A /a/ only occurs in closed syllables. Rimes with short A /a/ are written a single glyph. This is the only instance where vowel length is indicated in Tai Yo, all other vowel signs double as long and short vowels:






၂၅	၂၅	၂၅	၂၅
၂၅	၂၅	၂၅	၂၅
<i>chap</i>	<i>hak</i>	<i>mat</i>	<i>nam</i>
'snake skin'	'root'	'birthmark'	'thorn'

			
<i>chăp</i> 'perched'	<i>hăk</i> 'love'	<i>măt</i> 'vermin'	<i>năm</i> 'water'

When vowel /-o-/ proceeds coda M forming rime OM /-om/, a single rime sign, called SIGN OM (◌̣), is used as an alternative of LETTER O (◌̣) + LETTER MO (◌̣).

The following glyphs represent such rimes:

Succeeding rimes	Glyph	IPA	Tai Dam equivalent	Siamese equivalent	Sukhothai equivalent
LETTER AN		/-an/	นั	กัน	ฉนณ
LETTER AM		/-am/	ทั	ก่า	ฉฉา
LETTER AK		/-ak/	ทั	กัก	ฉฉฉ
LETTER AT		/-at/	ทั ⁴	กัต	ฉฉฉ
LETTER AP		/-ap/	ทั	กั	ฉฉฉ

Rime marks	Glyph	IPA	Tai Dam equivalent	Siamese equivalent	Sukhothai equivalent
SIGN UE		/-i:/	ทั	กี	ฉฉ
SIGN ANG		/-aŋ/	ทั	กัง	ฉฉฉ
SIGN AU		/-aw/	เทา	เกา	ฉฉ
SIGN AY		/-aj/	เ	ไก	ฉฉ
SIGN OM		/-om/	โ	กม	ฉฉ

⁴ นั in Tai Don.

3.3. Medial W

When the phonemes LOW K and HIGH K are followed by medial /w/, LOW KVO (𑜏𑜃𑜂, a ligature of LOW KO and LOW VO) (**Figure 9**) and HIGH KVO (𑜏𑜃𑜂, a ligature of HIGH KO and LOW VO) (**Figure 10**) are used respectively.

When other initial consonants are followed by medial /w/, the glyph of SIGN AY is used (**Figure 3**). Thus, SIGN AY is interpreted as rime /-aj/ with no succeeding glyph and as medial /-w-/ with succeeding glyphs for the rime.

As /-aj/	As /-w-/
𑜏+	𑜏+ 𑜏+
/ɲaj/	/ɲwɪən/

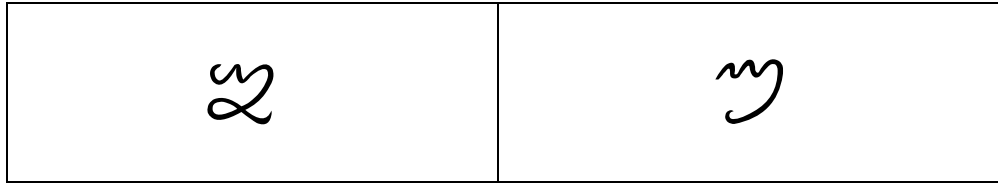
3.4. Special symbols

Name	Glyph	Tai Dam equivalent	Siamese equivalent	Notes
SYMBOL XAM LAI	𑜏	𑜏	๑	= Repetition mark.
SYMBOL MEUANG	⊙			Used for syllable <i>murōng</i> /miəŋ ^{A2} / = village, country, region.

LETTER HIGH NYO (𑜏) is also used for syllable *nhì* /ɲi:^{B2}/ as in the proper name of *Taaw Nyi* [*Khun Cheuang Epic*] and a Sino-Vietnamese word *nhị* (二).

SYMBOL XAM LAI (𑜏) has a stylistic variant: 𑜏. Use of this variant makes no difference in meaning and most authors consistently use either one or the other. One text is known in which the author switches variant halfway through the text on a new page.

DEFAULT SYMBOL XAM LAI	VARIANT SYMBOL XAM LAI
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3.5. Punctuation

Most traditional Yo Lai Tay manuscripts are written without punctuation marks. However, some aiding symbols are found in some manuscripts. All of these marks are the same as traditional Chinese punctuation marks and should be unified with them (**Figure 2**).

FULL STOP DOT	ENUMERATION COMMA
○	、
Codepoint: U+3002	Codepoint: U+3001

Modern texts sometimes make use of western punctuation marks in a way similar to vertical Chinese and Japanese (**Figure 15**). For this, the Latin punctuation marks () , : < > [] are used, rotated as expected. In addition, full-width U+FF01 (!) and U+FF1F (?) are used upright. The centred forms are preferred.

3.6. Numerals

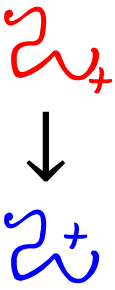
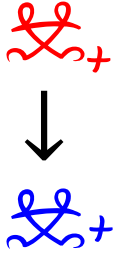
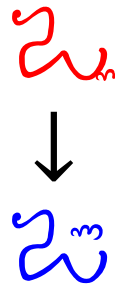
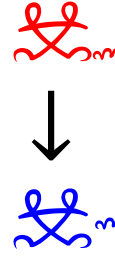
Yo Lai Tay does not use numerals, as numbers are generally spelled out. The use of numerals is predicted for modern texts, where it is expected that longer numbers will be written rotated in line with the text while individual numerals would be written upright. For the latter case full-width numerals (U+FF10 ... U+FF19) should be used.

4. Rendering

4.1. Mark positioning

Vowel marks should be rendered appropriately with the initial consonant.

HIGH TO + SIGN AY	HIGH FO + SIGN AY	HIGH TO + SIGN ANG	HIGH FO + SIGN ANG
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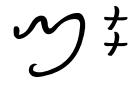

			
/taj/	/faj/	/tang/	/fan/

Since HIGH TO and HIGH FO are wider than other consonants, fonts without correct rendering function may have some positioning issues as in the red text: the vowel marks are too close to the tail of their preceding consonants. The blue ones are preferred and observed in manuscripts.

4.2. Medial W with vowel marks

When a word has SIGN AY as the medial /-w-/ and its vowel glyph is a right-side mark, the two marks are stacked vertically to avoid overlapping. Since one syllable has no more than one vowel mark, the right-side mark stack has no more than two layers. As far as we know, only /ɲwaj/ and /ʔwaj/ are found in Tai Yo vocabulary for such cases.

This behaviour is similar to Greek combining marks where, for example, U+0313 (◌̇) and U+0300 (◌̈) appear next to each other rather (◌̈̇) than stacked (*◌̈̇).

NGO + SIGN AY + SIGN AY	QO + SIGN AY + SIGN ANG
	
/ɲwaj/	/ʔwaj/

4.3. Tone marks

Although Tai Yo is a tonal language, the traditional *Yo Lai Tay* script uses no tone indicators. Readers have to guess the tone and meaning of a word from context. Modernizing attempts consider adding a tone mark system based on its sister scripts. Tai languages follow a common tone system, conventionally described as having 4 phonemic tones: A, B, C and D, where D is only for dead syllables (always with plosive codas). Tones in Siamese Thai have been indicated since Sukhothai era as in the Ram Khamhaeng stele, which dates from 1283-1290 AD. In the

Sukhothai script and the modern Thai script, tone A and D have no tone mark while tone B and tone C are represented by a diacritic on top of the syllable. The modern Lao script developed the same tone indicating system. Similarly since 1970s, modern scripts of Black Tai and White Tai have also developed tone marks for tones B and C which are included in Tai Viet Unicode block.

Tone marks	Tone marks of Yo Lai Tay in a modernizing attempt	Tai Dam equivalent	Siamese equivalent	Lao equivalent	Sukhothai equivalent
MARK 1 (TONE B)	ᵿ	ᵿ	ᵿ	ᵿ	ᵿ
MARK 2 (TONE C)	ᵿ	ᵿ	ᵿ	ᵿ	ᵿ

In one modernizing attempt (**Figure 16**), there are 2 tone marks for tones B and C. Both are written to the left of the onset of a syllable. We are not proposing these tone marks in this proposal but leaving them as a potential future additions.

5. Unicode Character Data

5.1. Collation

ᵿ LOW KO < ᵿ HIGH KO < ᵿ LOW KHO < ᵿ HIGH KHO < ᵿ GO < ᵿ NGO < ᵿ CO < ᵿ LOW XO < ᵿ HIGH XO < ᵿ LOW NYO < ᵿ HIGH NYO < ᵿ DO < ᵿ LOW TO < ᵿ HIGH TO < ᵿ THO < ᵿ NO < ᵿ BO < ᵿ LOW PO < ᵿ HIGH PO < ᵿ PHO < ᵿ LOW FO < ᵿ HIGH FO < ᵿ MO < ᵿ YO < ᵿ LO < ᵿ VO < ᵿ LOW HO < ᵿ HIGH HO < ᵿ QO < ᵿ LOW KVO < ᵿ HIGH KVO < ᵿ AA < ᵿ I < ᵿ UE < ᵿ SIGN UE < ᵿ U < ᵿ AE < ᵿ SIGN AU < ᵿ O < ᵿ E < ᵿ IA < ᵿ UEA < ᵿ UA < ᵿ OO < ᵿ AUE < ᵿ SIGN AY < ᵿ SIGN ANG < ᵿ AN < ᵿ AM < ᵿ AK < ᵿ AT < ᵿ AP < ᵿ SIGN OM

5.2. Line breaking and space

Word spacing between words is optional in *Yo Lai Tay* manuscripts. It appears that word spacing was more common practice among higher ranking writers as in **Figure 2** and **Figure 3**. In the revitalization effort, spacing between words is the default, although non-spaced texts can still be found.

In manuscripts without word spacing, line breaking could occur anywhere, even in the middle of a syllable between letters and only excludes line breaking before non-spacing marks.

5.3. Directionality

The *Yo Lai Tay* script is generally written from top to bottom in columns running from right to left. In modern publications, if vertical text is not possible, the line is simply turned on its side and runs

from left to right. The letters don't stay upright like in Japanese or Chinese, but are turned on their side, much like Mongolian.

According to UAX#50, the vertical property of *Yo Lai Tay* is R. The characters are displayed sideways in the code charts as they would appear in a horizontal layout and should be rotated 90 degrees in a vertical layout.

5.4. Character properties

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1E6C0;YO LAI TAY LETTER LOW KO;Lo;0;L;;;;N;;;
1E6C1;YO LAI TAY LETTER HIGH KO;Lo;0;L;;;;N;;;
1E6C2;YO LAI TAY LETTER LOW KHO;Lo;0;L;;;;N;;;
1E6C3;YO LAI TAY LETTER HIGH KHO;Lo;0;L;;;;N;;;
1E6C4;YO LAI TAY LETTER GO;Lo;0;L;;;;N;;;
1E6C5;YO LAI TAY LETTER NGO;Lo;0;L;;;;N;;;
1E6C6;YO LAI TAY LETTER CHO;Lo;0;L;;;;N;;;
1E6C7;YO LAI TAY LETTER LOW XO;Lo;0;L;;;;N;;;
1E6C8;YO LAI TAY LETTER HIGH XO;Lo;0;L;;;;N;;;
1E6C9;YO LAI TAY LETTER LOW NHO;Lo;0;L;;;;N;;;
1E6CA;YO LAI TAY LETTER HIGH NHO;Lo;0;L;;;;N;;;
1E6CB;YO LAI TAY LETTER DO;Lo;0;L;;;;N;;;
1E6CC;YO LAI TAY LETTER LOW TO;Lo;0;L;;;;N;;;
1E6CD;YO LAI TAY LETTER HIGH TO;Lo;0;L;;;;N;;;
1E6CE;YO LAI TAY LETTER THO;Lo;0;L;;;;N;;;
1E6CF;YO LAI TAY LETTER NO;Lo;0;L;;;;N;;;
1E6D0;YO LAI TAY LETTER BO;Lo;0;L;;;;N;;;
1E6D1;YO LAI TAY LETTER LOW PO;Lo;0;L;;;;N;;;
1E6D2;YO LAI TAY LETTER HIGH PO;Lo;0;L;;;;N;;;
1E5D3;YO LAI TAY LETTER PHO;Lo;0;L;;;;N;;;
1E6D4;YO LAI TAY LETTER LOW FO;Lo;0;L;;;;N;;;
1E6D5;YO LAI TAY LETTER HIGH FO;Lo;0;L;;;;N;;;
1E6D6;YO LAI TAY LETTER MO;Lo;0;L;;;;N;;;
1E6D7;YO LAI TAY LETTER YO;Lo;0;L;;;;N;;;
1E6D8;YO LAI TAY LETTER VO;Lo;0;L;;;;N;;;
1E6D9;YO LAI TAY LETTER LO;Lo;0;L;;;;N;;;
1E6DA;YO LAI TAY LETTER LOW HO;Lo;0;L;;;;N;;;
1E6DB;YO LAI TAY LETTER HIGH HO;Lo;0;L;;;;N;;;
1E6DC;YO LAI TAY LETTER QO;Lo;0;L;;;;N;;;
1E6DD;YO LAI TAY LETTER LOW KVO;Lo;0;L;;;;N;;;
1E6DE;YO LAI TAY LETTER HIGH KVO;Lo;0;L;;;;N;;;
1E6E0;YO LAI TAY LETTER AA;Lo;0;L;;;;N;;;
1E6E1;YO LAI TAY LETTER I;Lo;0;L;;;;N;;;
1E6E2;YO LAI TAY LETTER UE;Lo;0;L;;;;N;;;
1E6E3;YO LAI TAY SIGN UE;Mn;230;NSM;;;;N;;;
1E6E4;YO LAI TAY LETTER U;Lo;0;L;;;;N;;;
1E6E5;YO LAI TAY LETTER AE;Lo;0;L;;;;N;;;
1E6E6;YO LAI TAY SIGN AU;Mn;230;NSM;;;;N;;;
1E6E7;YO LAI TAY LETTER O;Lo;0;L;;;;N;;;
1E6E8;YO LAI TAY LETTER E;Lo;0;L;;;;N;;;
1E6E9;YO LAI TAY LETTER IA;Lo;0;L;;;;N;;;
1E6EA;YO LAI TAY LETTER UEA;Lo;0;L;;;;N;;;
1E6EB;YO LAI TAY LETTER UA;Lo;0;L;;;;N;;;
1E6EC;YO LAI TAY LETTER OO;Lo;0;L;;;;N;;;
1E6ED;YO LAI TAY LETTER AUE;Lo;0;L;;;;N;;;
1E6EE;YO LAI TAY SIGN AY;Mn;230;NSM;;;;N;;;
1E6EF;YO LAI TAY SIGN ANG;Mn;230;NSM;;;;N;;;
1E6F0;YO LAI TAY LETTER AN;Lo;0;L;;;;N;;;
1E6F1;YO LAI TAY LETTER AM;Lo;0;L;;;;N;;;
1E6F2;YO LAI TAY LETTER AK;Lo;0;L;;;;N;;;
1E6F3;YO LAI TAY LETTER AT;Lo;0;L;;;;N;;;
1E6F4;YO LAI TAY LETTER AP;Lo;0;L;;;;N;;;;
```

```
1E6F5;YO LAI TAY SIGN OM;Mn;230;NSM;;;;;N;;;;;
1E6FE;YO LAI TAY SYMBOL MEUANG;Lo;0;L;;;;;N;;;;;
1E6FF;YO LAI TAY XAM LAI;Lm;0;L;;;;;N;;;;;
```

5.5. Indic properties

Due to the linear nature of the script, no Indic character data is needed.

5.6. Line breaking properties

```
1E6C0.. 1E6E2, 1E6E4, 1E6E5, 1E6E7.. 1E6ED, 1E6F0.. 1E6F4, 1E6FE;AL #Lo
1E6E3, 1E6E6, 1E6EE, 1E6EF, 1E6F5;CM #Mn
1E6FF;AL #Lm
```

6.

	1E6C	1E6D	1E6E	1E6F
0	𐌲 1xx00	𐌳 1xx0F	𐌴 1xx20	𐌵 1xx30
1	𐌶 1xx01	𐌷 1xx10	𐌸 1xx21	𐌹 1xx31
2	𐌺 1xx02	𐌻 1xx11	𐌼 1xx22	𐌽 1xx32
3	𐌾 1xx1E	𐌿 1xx12	𐍀 1xx23	𐍁 1xx33
4	𐍃 1xx03	𐍄 1xx13	𐍅 1xx24	𐍆 1xx34
5	𐍉 1xx04	𐍊 1xx14	𐍋 1xx25	𐍌 1xx35
6	𐍎 1xx05	𐍏 1xx15	𐍐 1xx26	
7	𐍔 1xx06	𐍕 1xx16	𐍖 1xx27	
8	𐍘 1xx07	𐍙 1xx17	𐍚 1xx28	
9	𐍛 1xx08	𐍜 1xx18	𐍝 1xx29	
A	𐍞 1xx09	𐍟 1xx19	𐍠 1xx2A	
B	𐍢 1xx0A	𐍣 1xx1A	𐍤 1xx2B	
C	𐍨 1xx0B	𐍩 1xx1B	𐍪 1xx2C	
D	𐍮 1xx0C	𐍯 1xx1C	𐍰 1xx2D	
E	𐍲 1xx0D	𐍳 1xx1D	𐍴 ⁺ 1xx2E	𐍵 [⊙] 1xx3E
F	𐍹 1xx0E		𐍺 ^ε 1xx2F	𐍻 [⊙] 1xx3F

Letters

1E6C0	𑜃	YO LAI TAY LETTER LOW KO
1E6C1	𑜄	YO LAI TAY LETTER HIGH KO
1E6C2	𑜅	YO LAI TAY LETTER LOW KHO
1E6C3	𑜆	YO LAI TAY LETTER HIGH KHO
1E6C4	𑜇	YO LAI TAY LETTER GO
1E6C5	𑜈	YO LAI TAY LETTER NGO
1E6C6	𑜉	YO LAI TAY LETTER CO
1E6C7	𑜊	YO LAI TAY LETTER LOW XO
1E6C8	𑜋	YO LAI TAY LETTER HIGH XO
1E6C9	𑜌	YO LAI TAY LETTER LOW NYO
1E6CA	𑜍	YO LAI TAY LETTER HIGH NYO
1E6CB	𑜎	YO LAI TAY LETTER DO
1E6CC	𑜏	YO LAI TAY LETTER LOW TO
1E6CD	𑜐	YO LAI TAY LETTER HIGH TO
1E6CE	𑜑	YO LAI TAY LETTER THO
1E6CF	𑜒	YO LAI TAY LETTER NO
1E6D0	𑜓	YO LAI TAY LETTER BO
1E6D1	𑜔	YO LAI TAY LETTER LOW PO
1E6D2	𑜕	YO LAI TAY LETTER HIGH PO
1E6D3	𑜖	YO LAI TAY LETTER PHO
1E6D4	𑜗	YO LAI TAY LETTER LOW FO
1E6D5	𑜘	YO LAI TAY LETTER HIGH FO
1E6D6	𑜙	YO LAI TAY LETTER MO
1E6D7	𑜚	YO LAI TAY LETTER YO
1E6D8	𑜛	YO LAI TAY LETTER LO
1E6D9	𑜜	YO LAI TAY LETTER VO
1E6DA	𑜝	YO LAI TAY LETTER LOW HO
1E6DB	𑜞	YO LAI TAY LETTER HIGH HO
1E6DC	𑜟	YO LAI TAY LETTER QO
1E6DD	𑜠	YO LAI TAY LETTER LOW KVO
1E6DE	𑜡	YO LAI TAY LETTER HIGH KVO
1E6DF		<reserved>

Vowels and Finals

1E6E0	𑜁	YO LAI TAY LETTER AA
1E6E1	𑜂	YO LAI TAY LETTER I
1E6E2	𑜃	YO LAI TAY LETTER UE
1E6E3	𑜄	YO LAI TAY SIGN UE
1E6E4	𑜅	YO LAI TAY LETTER U
1E6E5	𑜆	YO LAI TAY LETTER AE
1E6E6	𑜇	YO LAI TAY SIGN AU
1E6E7	𑜈	YO LAI TAY LETTER O
1E6E8	𑜉	YO LAI TAY LETTER E
1E6E9	𑜊	YO LAI TAY LETTER IA
1E6EA	𑜋	YO LAI TAY LETTER UEA
1E6EB	𑜌	YO LAI TAY LETTER UA
1E6EC	𑜍	YO LAI TAY LETTER OO
1E6ED	𑜎	YO LAI TAY LETTER AUE
1E6EE	𑜏	YO LAI TAY SIGN AY
1E6EF	𑜐	YO LAI TAY SIGN ANG
1E6F0	𑜑	YO LAI TAY LETTER AN
1E6F1	𑜒	YO LAI TAY LETTER AM
1E6F2	𑜓	YO LAI TAY LETTER AK
1E6F3	𑜔	YO LAI TAY LETTER AT
1E6F4	𑜕	YO LAI TAY LETTER AP
1E6F5	𑜖	YO LAI TAY SIGN OM
1E6F6		<reserved>
1E6F7		<reserved>
1E6F8		<reserved>
1E6F9		<reserved>
1E6FA		<reserved>
1E6FB		<reserved>
1E6FC		<reserved>
1E6FD		<reserved>

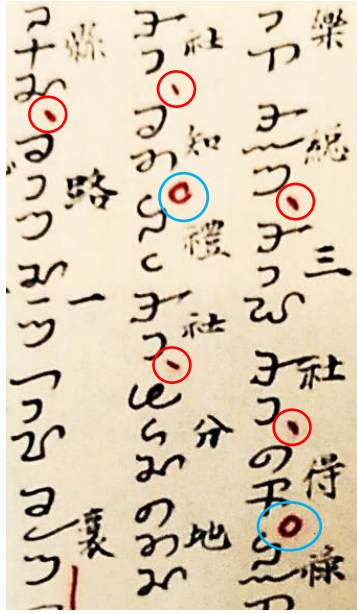
Symbols

1E6FE	𑜇	YO LAI TAY SYMBOL MEUANG
1E6FF	𑜈	YO LAI TAY XAM LAI

7. Materials



Figure 1: Two pages from a typical traditional *Yo Lai Tay* manuscript. The text is written without space and punctuation.



...ak xông , xam xa , đăk . lők
 ၇၄ ကိဒိုက် ကိုပိက်ကို ၆၅။ ၇၆
 xa , ti . lê xa , phôn đin
 ကို ကိ။ ၇၇ကို ၇၈ကိ ၇၉ကိ ၆၆
 viêng , tang nung yap tương
 ၇၉ကိ ၈၀ကိ ၈၁ကိ ၈၂ကိ ၈၃ကိ

Figure 2: Punctuation marks: FULL STOP DOT (◦ - blue circles) and ENUMERATION COMMA (、 - red circles). Spaces are also used between syllables in this text.

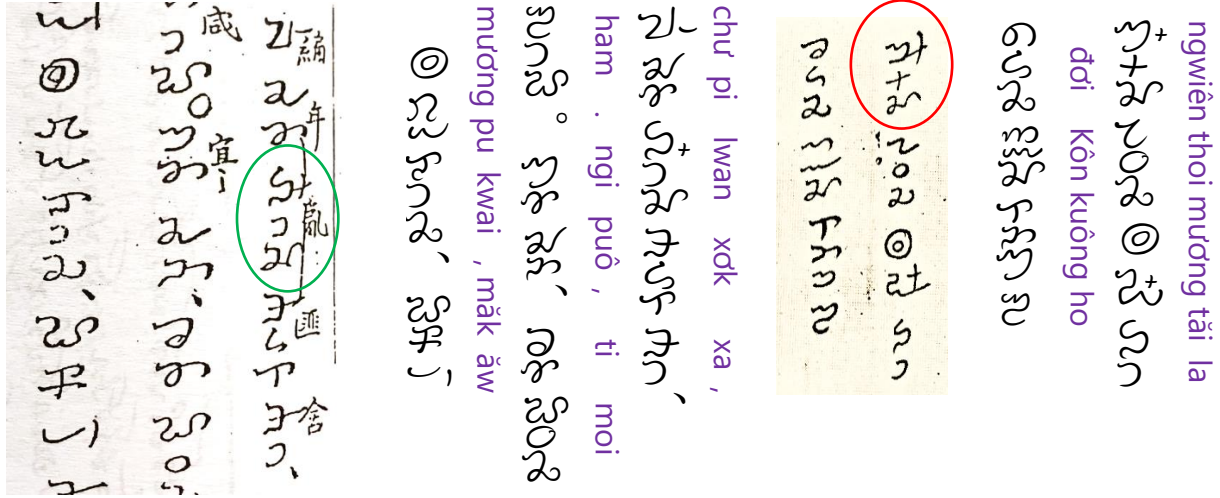


Figure 3: Examples of the medial -w- written as YO LAI TAY SIGN AY (◦◦) on the right side of the initial consonant letter. The syllable in red circle is *ngwiên* = origin, reason (Chinese 原, Sino-Vietnamese: *nguyên*); the other one in green circle is *lwăn* = rebellion, chaos (annotated with Chinese character 亂, Sino-Vietnamese: *loạn*). These texts use spaces between syllables like in **Figure 2**.

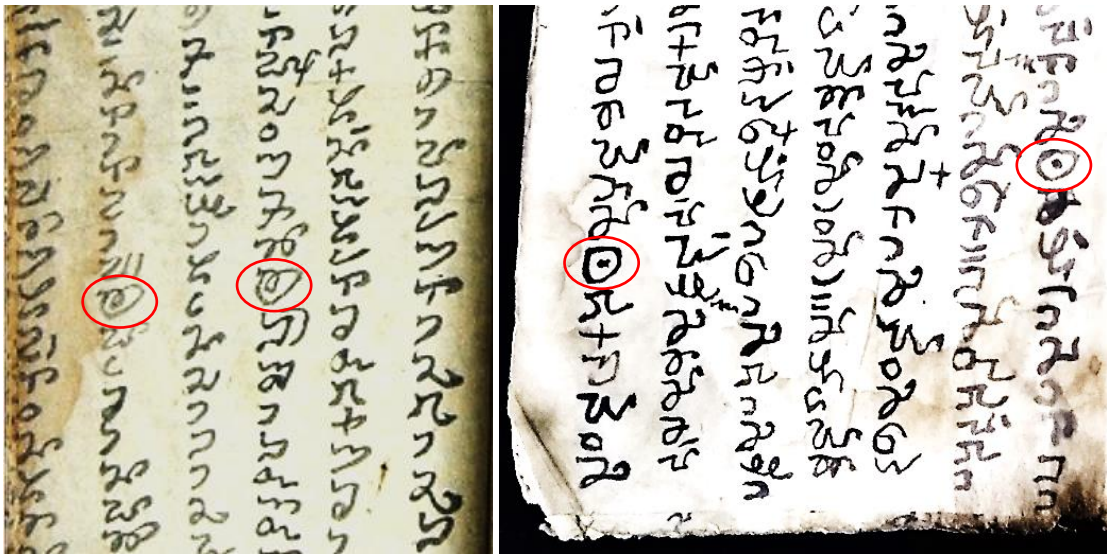


Figure 4: Examples of the symbol of *Muōng* (☉ - YO LAI TAY SYMBOL MEUANG).

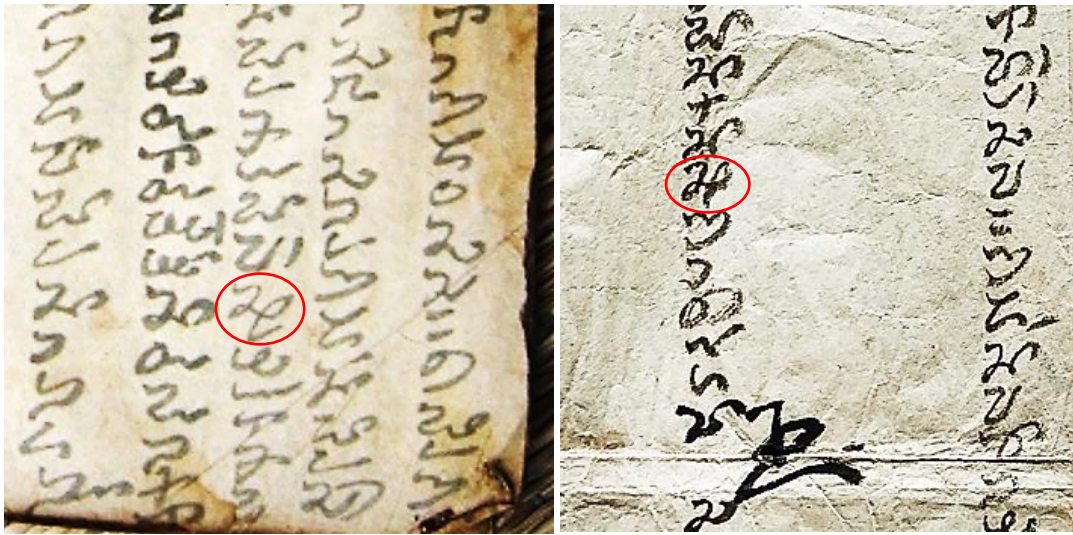


Figure 5: Examples of the symbol of *Nhì* (☼ - YO LAI TAY SYMBOL NYI).

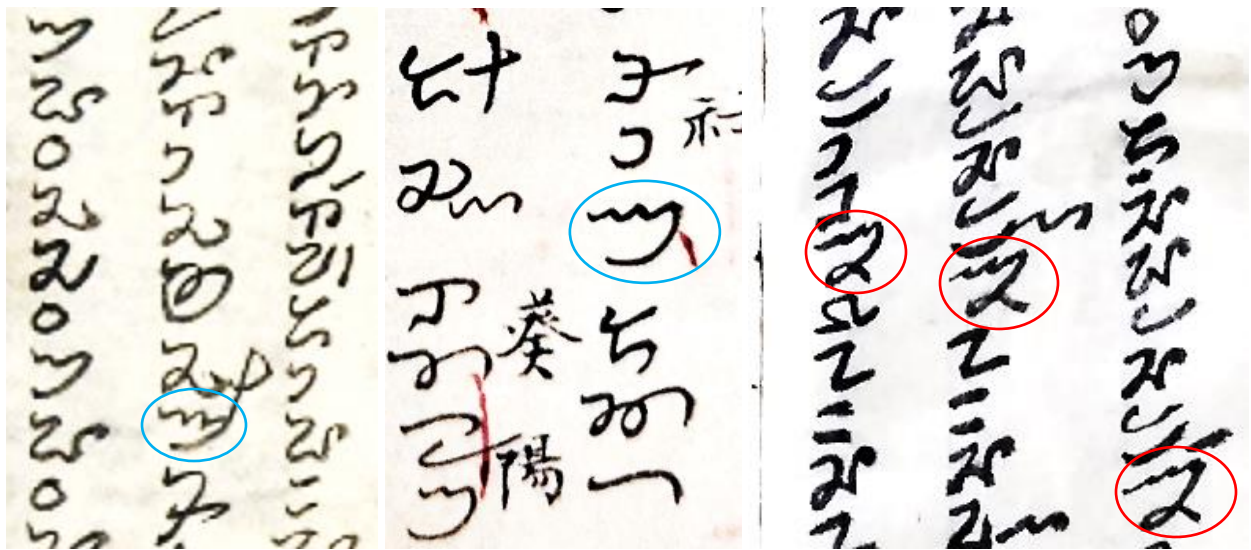


Figure 6: Examples of the symbol of *Xăm lāi*: YO LAI TAY SYMBOL REPETITION (𑄑) - blue circle) and YO LAI TAY SYMBOL REPETITION ALTERNATIVE (𑄒 - red circle).

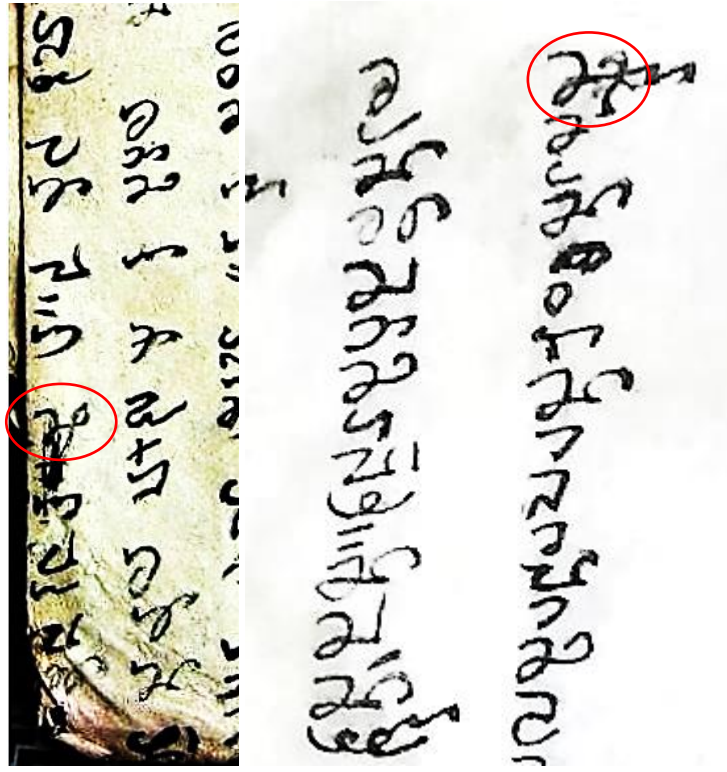


Figure 7: Examples of YO LAI TAY LETTER HIGH NYO (𑄓).

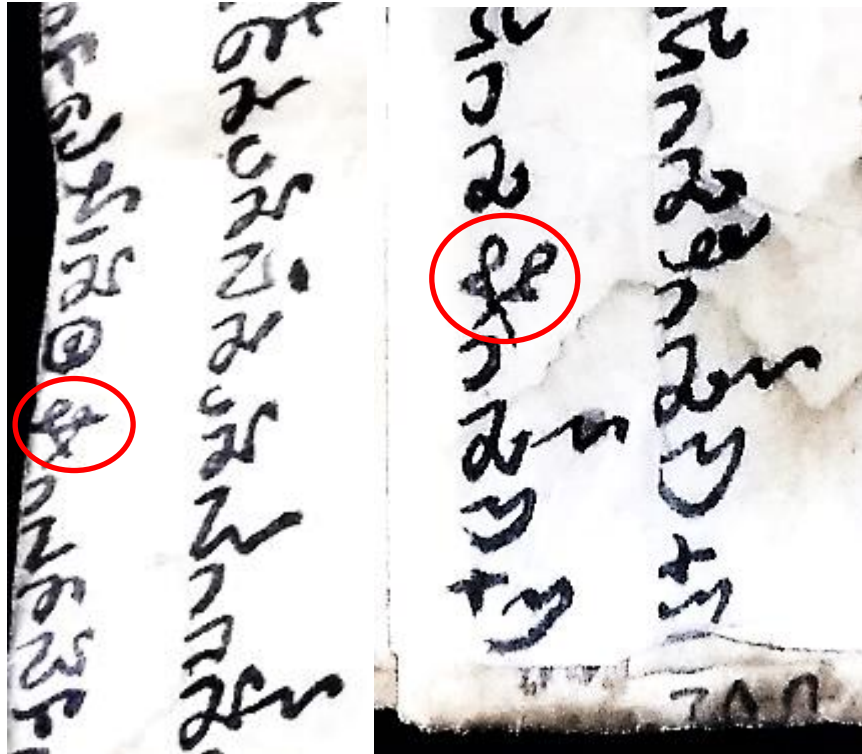


Figure 8: Examples of YO LAI TAY LETTER HIGH FO (ꨀ).

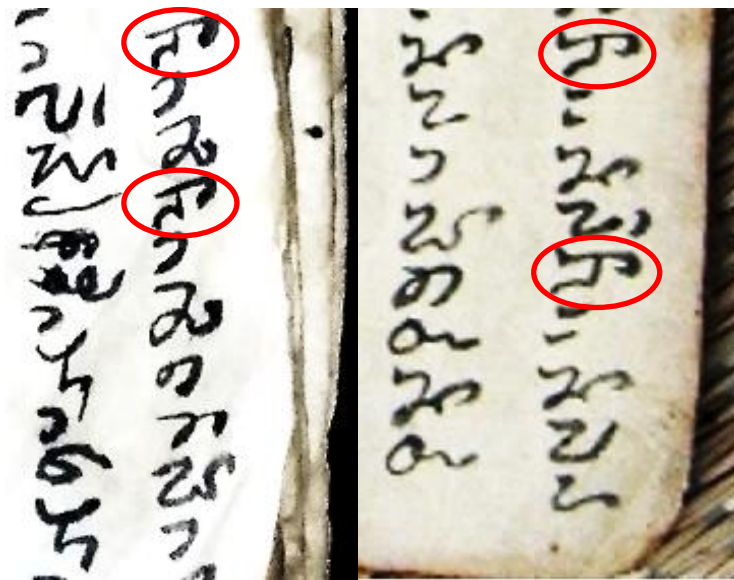


Figure 9: Examples of YO LAI TAY LETTER LOW KVO (ꨁ).

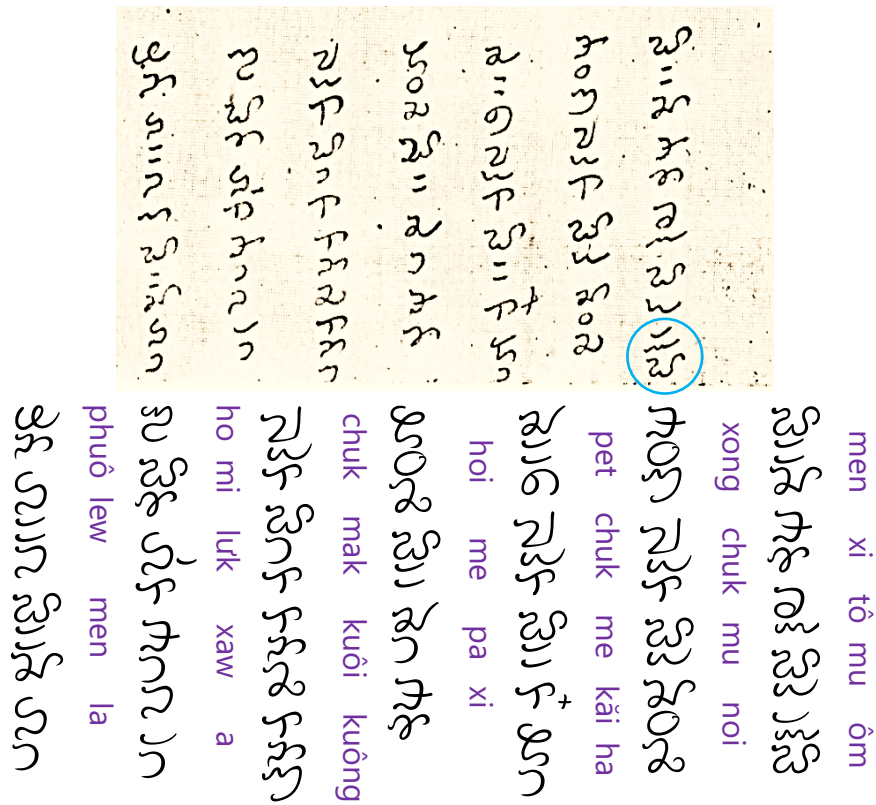


Figure 11: Examples of YO LAI TAY SIGN OM (◌ - red circle) and YO LAI TAY LETTER O + YO LAI TAY LETTER HIGH MO (◌ - blue circle) as rime OM /-om/.

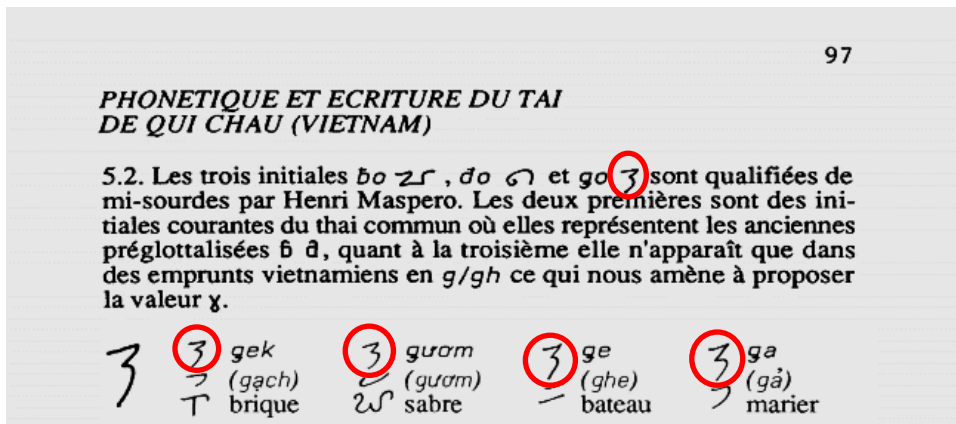


Figure 12: YO LAI TAY LETTER HIGH GO (◌) in Ferlus, 1993.

N.	Chữ cái	Tên chữ	Chữ-Việt	N.	Chữ cái	Tên chữ	Chữ-Việt
33	o	cọc	o	45	๒	tró	tr
34	๓	cố	ô	46	๔	cú	u
35	๕	cớ	ơ	47	๖	cúa	ua
36	๗	pó	p	48	๘	cứ	ư
37	๘	po	p	49	๙	cúra	ura
38	๙	phó	ph	50	๑๐	vó	v
39	๑๐	'phó	'ph	51	๑๑	xó	x
40	๑๑	ró	r	52	๑๒	xo	x
41	๑๒	só	s	53	๑๓	xăm mo	-
42	๑๓	tó	t	54	๑๔	ó	-
43	๑๔	to	t	55	๑๕	p'ha nha	p'h
44	๑๕	thó	th				

Figure 13: YO LAI TAY LETTER HIGH SO (๑๒, yellow), YO LAI TAY LETTER LOW RO (๑๑, green), and YO LAI TAY LETTER LOW TRO (๒, blue) in modern materials – a Lai Tay teaching textbook (Sâm Văn Bình, 2014).

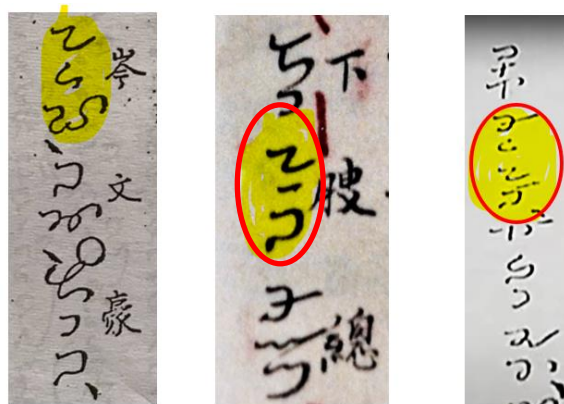


Figure 14: YO LAI TAY LETTER THO (๑) for phoneme HIGH SO in old materials for SÂM (๑๑๑) and SUU (๑) - red circle).

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