Zaima Styling Use Cases & CSS Limitation Exploration

intended audience: W3C reviewers familiar with the Ruby Markup and the CSS Ruby Layout Module Level 1 who can suggest refinements and styling techniques. Specialists in the Yaredic Zaima practice who can review the use cases and suggest others.

Zaima is the name given to the small cantillation annotations in the Ge'ez language hymnary that are rendered in one or more rows above base text. In this article the markup and CSS styling elements developed for rendering Ruby content are applied to Zaima samples that represent the most challenging use cases. The goal is to discover from application any limitations in markup and styling fascilities to support the requirements of Zaima presentation and thus derive a complete model for Zaima representation.

An equally important goal in developing digitally rendered samples is determining with practitioners what characteristics of the calligraphic tradition must be preserved in electronic media. Stylistic features in Zaima presentation may be idiosyncratic to a scribe, artifacts of the scribal process and tools, and need not be rendered in electronic documents. Other features may convey meaning that is critical to the practice and must be rendered in the same way electronically.

USE CASES

Use cases are selected that represent particular challenges in presentation beyond the regular Ruby use cases. Use cases are borrowed from a previous survey in a, now depreciated, article on Zaima Annotation which in turn provides the full page sources of the samples appearing here.

The samples here present focused layout requirements in isolation from their larger context. Larger samples will be produced to help access the overall readibility of electronically laid out Zaima in general, and to evaluate the layout choices made here.
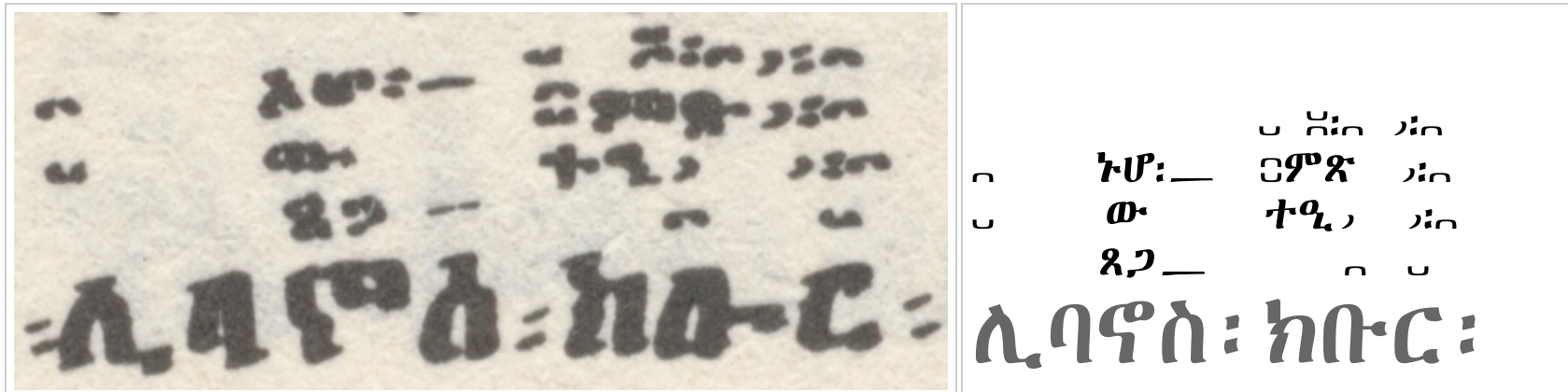
Use Case 1

Features:

- Fairly simple.
- Clear left align of , over ħ in 2nd row. Question: Is this positioning important vs a default center alignment?
- Spanning and centered miliket on 2nd, 3rd and 4th rows over the last two letters. The spanning-centered layout may or may not be important.
- Use Case Question: What is the correct positioning of the annotation in all rows?

Alternate Rendering

```
<ruby class="row4ex">
  <rb>ħ</rb><rt></rt>
  <rb>በሮ</rb><rt><span>ֺּ</span></rt>
</ruby>
<ruby class="row3ex">
  <rb>ħ</rb><rt></rt>
  <rb>በሮ</rb><rt><span>:ሞኂ</span></rt>
</ruby>
<ruby class="row2ex">
  <rb>ħ</rb><rt style="text-align: left;"><span>,</span></rt>
  <rb>በሮ</rb><rt><span>ሥቱ</span></rt>
</ruby>
<ruby class="row1">
  <rb>ħ</rb><rt>.</rt>
  <rb>በ</rb><rt>.</rt>
  <rb>ሮ</rb><rt>ሮ</rt>
</ruby>
```

```
<ruby class="row4ex">
  <rb>ħ</rb><rt></rt>
  <rb>በሮ</rb><rt><span>ֺּ</span></rt>
</ruby>
<ruby class="row3ex">
  <rb>ħ</rb><rt><span>:</span></rt>
  <rb>ሮ</rb><rt style="text-align: right;"><span>ሞኂ</span></rt>
</ruby>
<ruby class="row2ex">
  <rb>ħ</rb><rt><span>,</span></rt>
  <rb>በ</rb><rt></rt>
  <rb>ሮ</rb><rt style="text-align: right;"><span>ሥቱ</span></rt>
</ruby>
<ruby class="row1">
  <rb>ħ</rb><rt>.</rt>
  <rb>በ</rb><rt>.</rt>
  <rb>ሮ</rb><rt style="text-align: right;">ሮ</rt>
</ruby>
```

Figure 1 Selot Kidassie p. 113

Issues:

- Had to specify a 2nd column width or the example gets cut off by the table. A rendering engine appears not be calculating cell content width correctly.
- In the alternative rendering, unable to right align ruby-text over the final base character on rows 1, 2 and 3 using "ruby-align: right".
- ቱ and ኒ on rows 2 and 3 respectively appear to overhang the right side of ር unexpectedly. ር on row one aligns with the right side of ር as expected. This may be attributable to the font and not the layout engine.
- Is the first or second redendering preferable? Does the diference impact vocalization?

Use Case 2


```
<ruby class="row4ex">
  <rb>ሊ</rb><rt><span></span></rt>
  <rb>ባ</rb><rt><span></span></rt>
  <rb>ኖ</rb><rt><span></span></rt>
  <rb>ስ</rb><rt><span></span></rt>
  <rb>፥ክቡ</rb><rt style="text-align: center;"><span> ኂ <span class="diret_difat_ex"></span>፦.</span></rt>
  <rb>ር</rb><rt><span>፥.</span></rt>
</ruby>
<ruby class="row3ex">
  <rb>ሊ</rb><rt style="text-align: left;"><span>..</span></rt>
  <rb>ባ</rb><rt><span></span></rt>
  <rb>ኖ</rb><rt><span>ኡሆ፥</span></rt>
  <rb>ስ</rb><rt><span>__</span></rt>
  <rb>፥ክቡ</rb><rt><span><span class="difat_diret_ex"></span>ምጽ</span></rt>
  <rb>ር</rb><rt><span>፥.</span></rt>
</ruby>
<ruby class="row2ex">
  <rb>ሊ</rb><rt style="text-align: left;"><span>..</span></rt>
  <rb>ባ</rb><rt><span></span></rt>
  <rb>ኖ</rb><rt><span>ው</span></rt>
  <rb>ስ</rb><rt>__</rt>
  <rb>፥</rb><rt><span></span></rt>
  <rb>ክ</rb><rt><span>ተዒ</span></rt>
  <rb>ቡ</rb><rt style="text-align: left;"><span><span style="font-size: 25%;"> </span>ኄ</span></rt>
  <rb>ር</rb><rt><span>፥.</span></rt>
</ruby>
<ruby class="row1">
  <rb>ሊባ</rb><rt></rt>
  <rb>ኖ</rb><rt>ጻጋ</rt>
  <rb>ስ</rb><rt>__</rt>
  <rb>፥</rb><rt></rt>
  <rb>ክ</rb><rt></rt>
  <rb>ቡ</rb><rt>..</rt>
  <rb>ር</rb><rt>..</rt>፥
</ruby>
```

Figure 2 Zimarie Wemewasit

Issues:

- Could not center ኄ over ቡ in Row 2 because charcter width included the "u" diacritic mark. Desired "center" location was in the midline of the base glyph ቡ. Instead, "text-align: left;" is used with a right side space padding before the ኄ where the space used for padding is at a 25% scale.

Use Case 3

```
<ruby class="row5ex">
  <rb>ሊባ</rb><rt><span></span></rt>
  <rb>ኖ</rb><rt><span>፦</span></rt>
  <rb>ስሃ፡ና</rb><rt><span></span></rt>
  <rb>ክብ</rb><rt><span>      </span></rt>
  <rb>ር</rb><rt span style="text-align: right;"><span>ር</span></rt>
</ruby>
<ruby class="row4ex">
  <rb>ሊ</rb><rt><span></span></rt>
  <rb>ባኖ</rb><rt><span>፡፡</span></rt>
  <rb>ስሃ፡ና</rb><rt><span></span></rt>
  <rb>ክብ</rb><rt><span>      </span></rt>
  <rb>ር</rb><rt span style="text-align: right;"><span>ር</span></rt>
</ruby>
<ruby class="row3ex">
  <rb>ሊ</rb><rt><span>ᔈ </span></rt>
  <rb>ባኖስ</rb><rt><span>፡መን</span></rt>
  <rb>ሃ</rb><rt><span>ᔈ</span></rt>
  <rb>፡ ናክብ</rb><rt><span></span></rt>
  <rb>ር</rb><rt span style="text-align: right;"><span>ር</span></rt>
</ruby>
<ruby class="row2ex">
  <rb>ሊ</rb><rt><span>ᔈ </span></rt>
  <rb>ባኖስ</rb><rt><span>ᔈደሬ፡ᔈᔈ</span></rt>
  <rb>ሃ</rb><rt><span>ᔈᔈ</span></rt>
  <rb>፡</rb><rt></rt>
  <rb>ና</rb><rt><span>ᔈ</span></rt>
  <rb>ክብ</rb><rt></rt>
  <rb>ር</rb><rt span style="text-align: right;"><span>ር</span></rt>
</ruby>
<ruby class="row1">
  <rb>ሊ</rb><rt></rt>
  <rb>ባኖስ</rb><rt>ᔈደሬ፡ᔈᔈ</rt>
  <rb>ሃ</rb><rt>ᔈᔈ</rt>
  <rb>፡</rb><rt></rt>
  <rb>ና</rb><rt>ᔈ</rt>
  <rb>ክብ</rb><rt></rt>
  <rb>ር</rb><rt span style="text-align: right;"><span>ር</span></rt>፡
</ruby>
```

Figure 3 Zimarie Wemewasit

Issues:

- Unable to right align ruby-text over the final base character on rows 1, 2 and 3. Attempts were made with variations on: style="float: right; text-align: right; white-space: nowrap;"

```
<ruby class="row2ex">
  <rb>ወከ</rb><rt><span></span></rt>
  <rb>ነ፡ ፩</rb><rt><span>፥፡<span class="difat_diret_ex"></span>፥፣</span></rt>
  <rb>ዴ</rb><rt><span></span></rt>
</ruby>
<ruby class="row1">
  <rb>ወ</rb><rt>፥፡፥፡</rt>
  <rb>ኮነ፡ ፩</rb>
  <rt>ንሴ፥<span class="difat_diret_ex">፥፡፡፡<span class="difat_difat_ex"></span>፣</span></rt>
  <rb>ዴ</rb><rt>፥</rt>፡
</ruby>
```

```
<ruby class="row2ex">
  <rb>ወከ</rb><rt><span></span></rt>
  <rb>ነ፡ ፩</rb><rt><span>፡፡<span class="difat_diret_ex"></span>፥፣</span></rt>
  <rb>ዴ</rb><rt><span></span></rt>
</ruby>
<ruby class="row1">
  <rb>ወ</rb><rt>፥፡፥፡</rt>
  <rb>ኮነ፡ ፩</rb>
  <rt>ንሴ፥<span class="difat_diret_ex">፥፣<em>፡፡፡<span class="difat_difat_ex"></span></em>፥፣</span></rt>
  <rb>ዴ</rb><rt>፥</rt>፡
</ruby>
```

Figure 4 Zimarie Wemewasit

Issues:

- Unable to right align ruby-text over the final base character on rows 1, 2 and 3. Attempts were made with variations on: style="float: right; text-align: right; white-space: nowrap;"
- Is the first or second redendering preferable? Does the diference impact vocalization?

Use Case 5

```
<ruby class="row4ex red-miliket">
  <rb>ወወ</rb><rt><span>፤መ·ለ</span></rt>
  <rb>ህ</rb><rt><span>.</span></rt>
  <rb>በ</rb><rt><span></span></rt>
  <rb>ከ</rb><rt><span>,,</span></rt>
</ruby>
<ruby class="row3ex">
  <rb>ወ</rb><rt><span>ኢ.</span></rt>
  <rb>ወ</rb><rt><span>ይ</span></rt>
  <rb>ህ</rb><rt><span>ጛ</span></rt>
  <rb>በ</rb><rt><span></span></rt>
  <rb>ከ</rb><rt><span>ጐ</span></rt>
</ruby>
<ruby class="row2ex">
  <rb>ወ</rb><rt><span>፥..</span></rt>
  <rb>ወ</rb><rt><span>,</span></rt>
  <rb>ህበ</rb><rt><span></span></rt>
  <rb>ከ</rb><rt><span></span></rt>
</ruby>
<ruby class="row1">
  <rb>ወ</rb><rt>ቡር</rt>
  <rb>ወህብከ</rb><rt></rt>፡
</ruby>
```

```
<ruby class="row4ex red-miliket">
  <rb>ወወ</rb><rt><span>፤መ·ለ</span></rt>
  <rb>ህ</rb><rt><span>.</span></rt>
  <rb>በ</rb><rt><span></span></rt>
  <rb>ከ</rb><rt style="text-align: right;"><span>,,</span></rt>
</ruby>
<ruby class="row3ex">
  <rb>ወወ</rb><rt><span>ኢ.ይ</span></rt>
  <rb>ህ</rb><rt><span>ጛ</span></rt>
  <rb>በ</rb><rt><span></span></rt>
  <rb>ከ</rb><rt style="text-align: right;"><span>ጐ,</span></rt>
</ruby>
<ruby class="row2ex">
  <rb>ወ</rb><rt><span>፥..</span></rt>
  <rb>ወ</rb><rt><span>,</span></rt>
  <rb>ህበ</rb><rt><span></span></rt>
  <rb>ከ</rb><rt><span></span></rt>
</ruby>
<ruby class="row1">
  <rb>ወ</rb><rt>ቡር</rt>
  <rb>ወህብከ</rb><rt></rt>፡
</ruby>
```

Figure 5 Merha Liqawnt

Issues:

- Verify ይ or ዩ in row 3
- Right justify desired for ኢ. above ወ on row 3, and for both ጐ and ,, above ከ on rows 3 and 4 respectively
- ፡ would vanish if placed after the closing ruby tag as per:

  `<rb>ወህብከ</rb><rt><span></span></rt></ruby>፡`

  Accordingly it was placed just within the closing ruby tag as per:

  `<rb>ወህብከ</rb><rt><span></span></rt>፡</ruby>`

  This may be a browser issue or an issue with the markup approach taken.
- Is the first or second redendering preferable? Does the diference impact vocalization?

Use Case 6

እጽነ
ፚፚ   ነ   ርእሶ
ባነሕራንኂ ፥

እጽነ
ፚፚ   ነ   ርእሶ
ባነሕራንኂ ፥

```
<ruby class="row3ex red-miliket">
  <rb>ባ</rb><rt><span>፡</span></rt>
  <rb>ነሕ</rb><rt><span></span></rt>
  <rb>ራ</rb><rt><span>．</span></rt>
  <rb>ን</rb><rt><span></span></rt>
  <rb>ኂ</rb><rt><span>．．</span></rt>
</ruby>
<ruby class="row2ex">
  <rb>ባኂ</rb><rt><span>እጽነ</span></rt>
  <rb>ሕራኂ</rb><rt></rt>
</ruby>
<ruby class="row1 red-base">
  <rb>ባ</rb><rt><span class="diret_difat_ex"></span>
  ><span class="diret_difat_ex"></span></rt>
  <rb>ነሕ</rb><rt></rt>
  <rb>ራ</rb><rt>ነ</rt>
  <rb>ንኂ</rb><rt>ርእሶ</rt><span style="color: red">፥</span>
</ruby>
```

```
<ruby class="row3ex red-miliket">
  <rb>ባ</rb><rt><span>፡</span></rt>
  <rb>ነሕ</rb><rt><span></span></rt>
  <rb>ራ</rb><rt><span>．</span></rt>
  <rb>ን</rb><rt><span></span></rt>
  <rb>ኂ</rb><rt><span>．．</span></rt>
</ruby>
<ruby class="row2ex">
  <rb>ባ</rb><rt><span>እጽነ</span></rt>
  <rb>ነሕራኂ</rb><rt></rt>
</ruby>
<ruby class="row1 red-base">
  <rb>ባ</rb><rt><span class="diret_difat_ex"></span>
  ><span class="diret_difat_ex"></span></rt>
  <rb>ነሕ</rb><rt></rt>
  <rb>ራ</rb><rt>ነ</rt>
  <rb>ንኂ</rb><rt>ርእሶ</rt><span style="color: red">፥</span>
</ruby>
```

Figure 6 Merha Liqawnt

Issues:

- Unable to right align ruby-text over the final base character on rows 1, 2 and 3. Attempts were made with variations on: style="float: right; text-align: right; white-space: nowrap;"
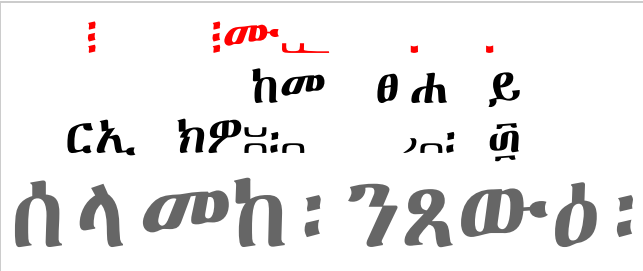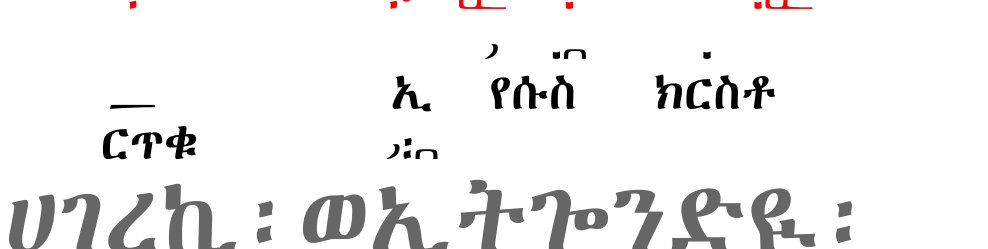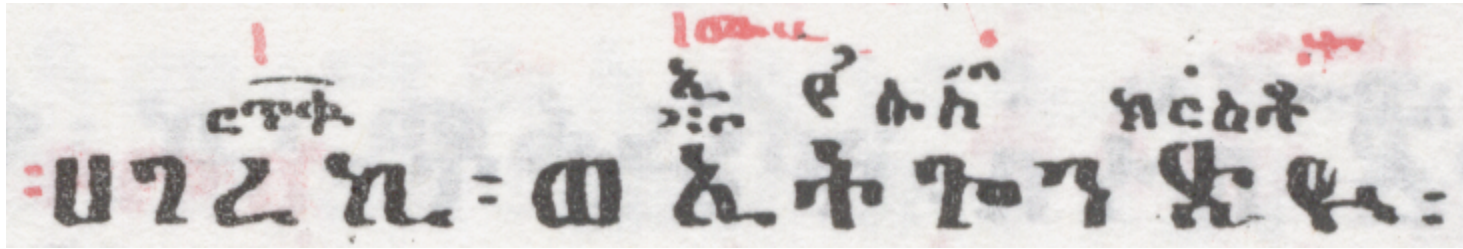- Is the first or second redendering preferable? Does the diference impact vocalization?

Use Case 7

```
<ruby class="row3ex red-miliket">
  <rb>ሰ</rb><rt><span></span></rt>
  <rb>ላ</rb><rt><span>፡</span></rt>
  <rb>መ</rb><rt><span></span></rt>
  <rb>ከ፡</rb><rt><span>፡መ፡ᑊ</span></rt>
  <rb>ን</rb><rt><span></span></rt>
  <rb>ጸ</rb><rt><span>.</span></rt>
  <rb>ው</rb><rt><span>.</span></rt>
  <rb>ዕ፡</rb><rt><span></span></rt>
</ruby>
<ruby class="row2ex">
  <rb>ሰ</rb><rt><span></span></rt>
  <rb>ላ</rb><rt><span style="visibility: hidden;">ርኢ</span></rt>
  <rb>መ</rb><rt><span></span></rt>
  <rb>ከ፡</rb><rt><span>ከመ</span></rt>
  <rb>ን</rb><rt style="text-align: right;"><span>ፀ</span></rt>
  <rb>ጸ</rb><rt><span>ሐ</span></rt>
  <rb>ው</rb><rt><span>ይ</span></rt>
  <rb>ዕ፡</rb><rt><span></span></rt>
</ruby>
<ruby class="row1">
  <rb>ሰ</rb><rt></rt>
  <rb>ላ</rb><rt>ርኢ.</rt>
  <rb>መከ፡</rb><rt>ከዎ<span class="diret_difat_ex"></span>፡.ᑊ</rt>
  <rb>ን</rb><rt></rt>
  <rb>ጸ</rb><rt>ﬞ..፡</rt>
  <rb>ው</rb><rt>ﬞﬗ</rt>
  <rb>ዕ፡</rb><rt></rt>
</ruby>
```

Figure 7 Merha Liqawnt

Issues:

- Unable to right align ruby-text over the final base character on rows 1, 2 and 3. Attempts were made with variations on: style="float: right; text-align: right; white-space: nowrap;"

Use Case 8

```
<ruby class="row4ex red-miliket">
  <rb>ህገ</rb><rt><span></span></rt>
  <rb>ረ</rb><rt><span>፥</span></rt>
  <rb>ኪ ፡ ወ</rb><rt><span></span></rt>
  <rb>ኢት</rb><rt><span>፥መ፡</span></rt>
  <rb>ጕ</rb><rt><span>.</span></rt>
  <rb>ንድ</rb><rt><span></span></rt>
  <rb>ዩ</rb><rt><span>...</span></rt>
</ruby>
<ruby class="row3ex">
  <rb>ህገ</rb><rt></rt>
  <rb>ረ</rb><rt></rt>
  <rb>ኪ ፡ ወኢ</rb><rt><span></span></rt>
  <rb>ት</rb><rt><span>,</span></rt>
  <rb>ጕ</rb><rt><span>...</span></rt>
  <rb>ን</rb><rt><span></span></rt>
  <rb>ድ</rb><rt><span>.</span></rt>
  <rb>ዩ</rb><rt><span></span></rt>
</ruby>
<ruby class="row2ex">
  <rb>ህገ</rb><rt></rt>
  <rb>ረ</rb><rt><span>__</span></rt>
  <rb>ኪ ፡ ወ</rb><rt></rt>
  <rb>ኢ</rb><rt><span>ኢ</span></rt>
  <rb>ትጕ</rb><rt><span>የሱስ</span></rt>
  <rb>ንድዩ</rb><rt><span>ክርስቶ</span></rt>
</ruby>
<ruby class="row1">
  <rb>ህ</rb><rt></rt>
  <rb>ገረኪ</rb><rt>ርጥቁ</rt>
  <rb>፡ ወ</rb><rt></rt>
  <rb>ኢ</rb><rt>,:..</rt>
  <rb>ት</rb><rt></rt>
  <rb>ጕ</rb><rt></rt>
  <rb>ን</rb><rt></rt>
  <rb>ድ</rb><rt></rt>
  <rb>ዩ</rb><rt></rt>:
</ruby>
```

Figure 8 Merha Liqawnt p. 23

Issues:

- Unable to right align ruby-text over the final base character on rows 1, 2 and 3. Attempts were made with variations on: style="float: right; text-align: right; white-space: nowrap;"

Use Case 9

Features:

- The ፥።፡ sequence spans 2 letters along a render line rising at a slight angle to the right.
- The alternate rendering divides the ፥።፡ sequence over ያ and ጕ seprately.
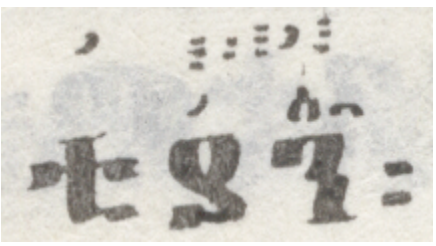- *TBD: Add a context note (modes, ceremonies).*

Alternate Rendering


```
<ruby class="row2ex">
  <rb>ቲ</rb><rt><span>፡</span></rt>
  <rb>ያን</rb><rt><span>፡፡፡</span></rt>
</ruby>
<ruby class="row1">
  <rb>ቲ</rb><rt></rt>
  <rb>ያ</rb><rt>፡</rt>
  <rb>ን</rb><rt>ሏ</rt>፡
</ruby>
```

```
<ruby class="row2ex">
  <rb>ቲ</rb><rt><span>፡</span></rt>
  <rb>ያ</rb><rt><span>፡</span></rt>
  <rb>ን</rb><rt><span>፡፡</span></rt>
</ruby>
<ruby class="row1">
  <rb>ቲ</rb><rt></rt>
  <rb>ያ</rb><rt>፡</rt>
  <rb>ን</rb><rt>ሏ</rt>፡
</ruby>
```

Figure 9 Selot Kidasie p. 9

Issues:

- Unable to use "ruby-align: space-between;" to distribute ፡፡፡ over ያን.
- Is anything lost when the rising qirts marks are arranged fully horizontal and not rising? Can the Zaima be reproduced vocally in the same way?
- Is the first or second redendering preferable? Does the diference impact vocalization?

Use Case 10

Features:

- Fairly simple.
- Presence of the chord ∴ which must render inline with a row.
- The ፡፡፡ sequence spans 2 or possibly 3 letters along a render line rising at a slight angle to the right.
- *TBD: Add a context note (modes, ceremonies).*


```
<ruby class="row2ex red-miliket">
  <rb>ሐዋ</rb><rt><span>ሰማ፡</span></rt>
  <rb>ር</rb><rt></rt>
  <rb>ያት</rb><rt style="text-align: left; rotate(5deg);"><span>፡፡<span class="difat_difat_ex"></span> ፡</span></rt>
</ruby>
<ruby class="row1">
  <rb>ሐ</rb><rt>ﹾ</rt>
  <rb>ዋ</rb><rt>ሰማ</rt>
  <rb>ር</rb><rt></rt>
  <rb>ያ</rb><rt>ደ</rt>
  <rb>ት</rb><rt>ታት</rt>፡
</ruby>
```

Figure 10 Selot Kidassie p. 129

Issues:

- Unable to use "ruby-align: space-between;" to distribute ፡፡፡ over ርያት.
- Determine if the bottom row is actually two rows.
- Determine if ደ above ያ might actually be ይ.

Use Case 11

Features:

- Right side overhang, rising.


```
<ruby class="row3ex red-miliket">
  <rb>ገብ</rb><rt></rt>
  <rb>ር</rb><rt></rt>ኤ
  <rb>ል ፡ </rb><rt><span> ፡መ፡ᴗ</span></rt>
</ruby>
<ruby class="row2ex">
  <rb>ገብርኤ</rb><rt></rt>
  <rb>ል ፡ </rb><rt><span>ሉሊ</span></rt>
</ruby>
<ruby class="row1">
  <rb>ገብ</rb><rt style="ruby-align: start">ያ</rt>
  <rb>ር</rb><rt>ሐ</rt>
  <rb>ኤ</rb><rt></rt>
  <rb>ል ፡ </rb><rt>ንስ,,,,</rt>
</ruby>
```
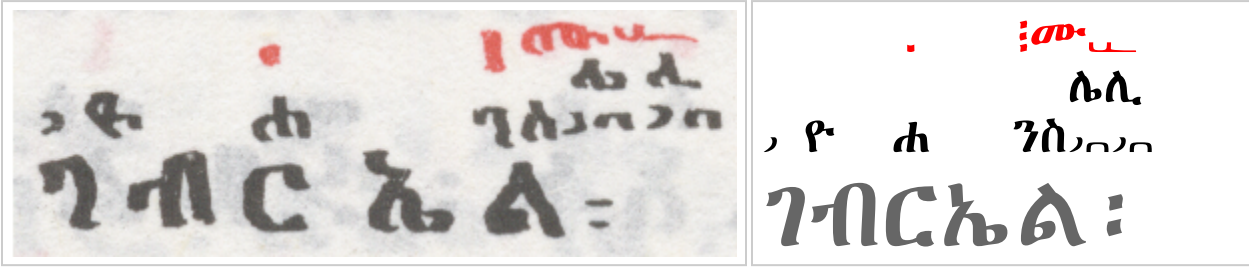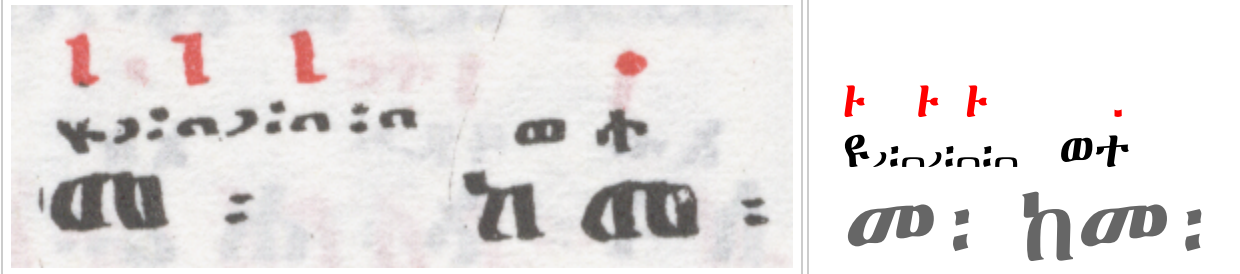
Figure 11 Selot Kidasie

Issues:

- Unable to right align ruby-text over the final base character on rows 1, 2 and 3. Attempts were made with variations on: style="float: right; text-align: right; white-space: nowrap;"

Use Case 12

Features:

- Right side overhang, rising.

```
<ruby class="row2ex red-miliket">
  <rb>መ፡</rb><rt><span> ተ  ተ ተ</span></rt>
  <rb>ከ</rb><rt><span></span></rt>
  <rb>መ</rb><rt><span> .</span></rt>
</ruby>
<ruby class="row1">
  <rb>መ፡</rb><rt> ዮ፡ነ፡ነ፡ነ</rt>
  <rb>ከመ</rb><rt>ወተ</rt>፡
</ruby>
```

Figure 12 Merha Liqawnt p. 66

Issues:

-

Use Case 13

Features:

- Inner overhang, falling.


```
<ruby class="row2ex red-miliket">
  <rb>ዘከ </rb><rt style="text-align: left;"><span>. ተ ተ</span></rt>
  <rb>ነ፡</rb><rt><span>ተመ፡ᴜ</span></rt>
</ruby>
<ruby class="row1">
  <rb>ዘከ </rb><rt style="text-align: left;">ወከ፡ነ፡ነ፡</rt>
  <rb>ነ፡</rb><rt>ነ፡ነ፡ነ</rt>
</ruby>
```

Figure 13 Merha Liqawnt p. 84

Issues:

-

Use Case 14

Features:

- Inner overhang.

```
<ruby class="row2ex red-miliket">
  <rb>ኪ</rb><rt></rt>
  <rb>ያ</rb><rt><span>ቱ</span></rt>
  <rb>ክ</rb><rt></rt>
  <rb>፥ አ  </rb><rt style="text-align: left;"><span>  ቱ ቱ ቱ</span></rt>
  <rb>ግ</rb><rt></rt>
</ruby>
<ruby class="row1">
  <rb>ኪ</rb><rt></rt>
  <rb>ያ</rb><rt>ጽን</rt>
  <rb>ክ</rb><rt></rt>
  <rb>፥ አ  </rb><rt style="text-align: left;"> ቡብኃ፡ለኃ፡ለኃ</rt>
  <rb>ግ</rb><rt>መ</rt>
</ruby>
```
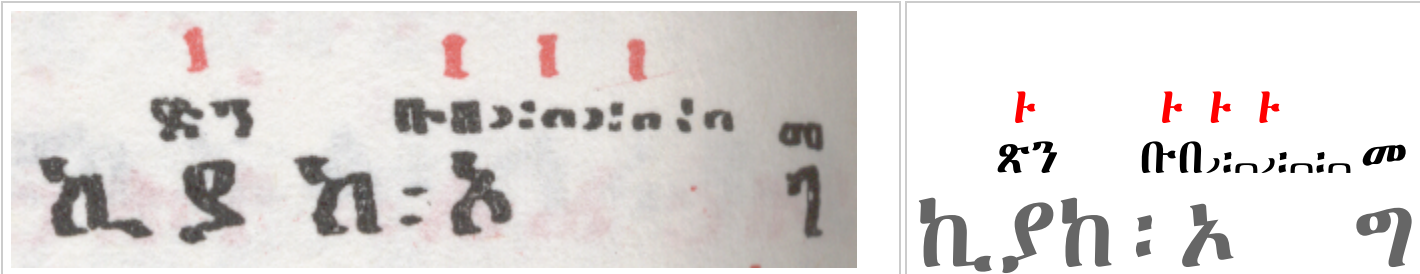
Figure 14 Merha Liqawnt

Issues:

- "text-align: left;" of ቡብኃ፡ለኃ፡ለኃ in the rt over ፥ አ had no effect, until an " " was added in the rb.
- An " " was added to after ፥ አ to force alignment of ቡ over ፥ and not the white space before it. This forced space between ፥ and አ.

Use Case 15

Features:

- Left side overhang.


```
<ruby class="row3ex red-miliket">
  <rb>ጉ</rb><rt style="text-align: right;"><span>፡መ፦</span></rt>
  <rb>ር</rb><rt></rt>
  <rb>ዬ</rb><rt><span>.</span></rt>
  <rb>ሁ</rb><rt><span>ሚ</span></rt>
</ruby>
<ruby class="row2ex">
  <rb>ጉ</rb><rt style="text-align: right;"><span>ብር፡ን</span></rt>
  <rb>ርዬሁ</rb><rt></rt>
</ruby>
<ruby class="row1">
  <rb>ጉ</rb><rt style="text-align: right;">መሦ </rt>
  <rb>ር</rb><rt>ራ</rt>
  <rb>ዬ</rb><rt>ራ</rt>
  <rb>ሁ</rb><rt>ሃ</rt>
</ruby>
```

Figure 15 Merha Liqawnt

Issues:

Use Case 16

Alternate Rendering

በእ
ቡብ
ገጸ
በእ
ምሕረት

በእ
ቡብ
ገ   ጸ
በእ
ምሕረት

```
<ruby class="row4ex">
  <rb>ም፞ሕ</rb><rt></rt>
  <rb>ረ</rb><rt><span>በእ</span></rt>
  <rb>ት</rb><rt></rt>
</ruby>
<ruby class="row3ex">
  <rb>ም፞ሕ</rb><rt></rt>
  <rb>ረ</rb><rt><span>ቡብ</span></rt>
  <rb>ት</rb><rt></rt>
</ruby>
<ruby class="row2ex red-miliket">
  <rb>ም፞ሕ</rb><rt></rt>
  <rb>ረ</rb><rt><span>ገጸ</span></rt>
  <rb>ት</rb><rt></rt>
</ruby>
<ruby class="row1">
  <rb>ም፞ሕ</rb><rt></rt>
  <rb>ረ</rb><rt>በእ</rt>
  <rb>ት</rb><rt></rt>
</ruby>
```

```
<ruby class="row4ex">
  <rb>ም፞ሕ</rb><rt></rt>
  <rb>ረ</rb><rt><span>በእ</span></rt>
  <rb>ት</rb><rt></rt>
</ruby>
<ruby class="row3ex">
  <rb>ም፞ሕ</rb><rt></rt>
  <rb>ረ</rb><rt><span>ቡብ</span></rt>
  <rb>ት</rb><rt></rt>
</ruby>
<ruby class="row2ex red-miliket">
  <rb>ም፞</rb></rb><rt></rt>
  <rb>ሕ</rb><rt style="text-align: right;"><span>ገ</span></rt>
  <rb>ረ</rb><rt></rt>
  <rb>ት</rb><rt style="text-align: left;"><span>ጸ</span></rt>
</ruby>
<ruby class="row1">
  <rb>ም፞ሕ</rb><rt></rt>
  <rb>ረ</rb><rt>በእ</rt>
  <rb>ት</rb><rt></rt>
</ruby>
```

Figure 16 Selot Kidasie

Issues:

- Unable to right align ruby-text over the final base character on rows 1, 2 and 3. Attempts were made with variations on: style="float: right; text-align: right; white-space: nowrap;"
- Is the first or second redendering preferable? Does the diference impact vocalization?

Use Case 17

```
<span style="font-size: 50px;">ይሕ፤ </span
><ruby class="row3ex red-miliket">
  <rb>ኪ</rb><rt><span></span></rt>
  <rb>ያ</rb><rt><span></span></rt>
  <rb>ክ</rb><rt><span></span></rt><rb>፡ ን</rb><rt><span></span></rt>
  <rb>ሴብሕ</rb><rt><span>:ጤሪ:፨</span></rt><rb>፡ </rb><rb>እ</rb><rt><span></span></rt>
  <rb>ግዚ</rb><rt><span></span></rt>
  <rb>አ</rb><rt><span></span></rt>
</ruby>
<ruby class="row2ex red-miliket">
  <rb>ኪ</rb><rt><span>ረዩ</span></rt>
  <rb>ያክ</rb><rt><span>:፡:።:</span></rt><rb>፡ ን</rb><rt><span> ፡፡</span></rt>
  <rb>ሴ</rb><rt><span>:</span></rt>
  <rb>ብ</rb><rt><span>፡፡</span></rt>
  <rb>ሕ</rb><rt><span>፡፡</span></rt><rb>፡ </rb><rb>እ</rb><rt><span> —</span></rt>
  <rb>ግዚ</rb><rt><span></span></rt>
  <rb>አ</rb><rt><span>ስ</span></rt>፡
</ruby>
<ruby class="row1">
  <rb>ኪ</rb><rt>—</rt>
  <rb>ያ</rb><rt>.</rt>
  <rb>ክ</rb><rt>ቱ</rt><rb>፡ ን</rb><rt> ፡፡</rt>
  <rb>ሴ</rb><rt>፡</rt>
  <rb>ብ</rb><rt>፡</rt>
  <rb>ሕ</rb><rt>፡፡</rt><rb>፡ </rb><rb>እ</rb><rt> —</rt>
  <rb>ግዚ</rb><rt></rt>
  <rb>አ</rb><rt>ስ</rt>፡
</ruby>
<br/><br/>
<span style="font-size: 50px;">ይሕ፤ </span>
><ruby class="row2ex red-miliket">
  <rb>ኪያ</rb><rt><span>:፡፡</span></rt>
  <rb>ክ</rb><rt><span>ረዩ</span></rt>
  <rb>፡ ን</rb><rt><span> ፡፡</span></rt>
  <rb>ዌ</rb><rt><span>:</span></rt>
  <rb>ድ</rb><rt><span>፡፡</span></rt>
  <rb>ስ</rb><rt><span>፡፡</span></rt>፡<rb>እ</rb><rt><span> —</span></rt>
  <rb>ግዚ</rb><rt><span></span></rt>
  <rb>አ</rb><rt><span>ስ</span></rt>፡
</ruby>
<ruby class="row1">
  <rb>ኪ</rb><rt>—</rt>
  <rb>ያ</rb><rt>.</rt>
  <rb>ክ</rb><rt>ቱ</rt><rb>፡ ን</rb><rt> ፡፡</rt>
  <rb>ዌ</rb><rt>፡</rt>
  <rb>ድ</rb><rt>፡</rt>
  <rb>ስ</rb><rt>፡፡</rt>፡<rb>እ</rb><rt> —</rt>
  <rb>ግዚ</rb><rt></rt>
  <rb>አ</rb><rt>ስ</rt>፡
</ruby>
```

Figure 17 Merha Liqawnt p. 103

Issues:

Use Case 18

Alternate Rendering


```
<ruby class="row3ex red-miliket">
  <rb>ወ</rb><rt><span></span></rt>
  <rb>ዕ</rb><rt><span></span></rt>
  <rb>ለት</rb><rt><span>ለ፡፡</span></rt>
  <rb>፡</rb><rt><span></span></rt>
  <rb>ኩነ</rb><rt><span>፡፡</span></rt>
  <rb>ኔ</rb><rt><span></span></rt>
</ruby>
<ruby class="row2ex">
  <rb>ወ</rb><rt><span>ˌ</span></rt>
  <rb>ዕ</rb><rt><span>፡</span></rt>
  <rb>ለት</rb><rt><span>ለገ</span></rt>
  <rb>፡</rb><rt><span></span></rt>
  <rb>ኩ</rb><rt><span>ˌ</span></rt>
  <rb>ነ</rb><rt><span>ˌ</span></rt>
  <rb>ኔ</rb><rt><span>ቃ</span><span style="color: red;">ር</span></rt>
</ruby>
<ruby class="row1">
  <rb>ወ</rb><rt><span style="color: red;">__</span></rt>
  <rb>ዕ</rb><rt></rt>
  <rb>ለት</rb><rt>ቀጽ</rt>
  <rb>፡</rb><rt></rt>
  <rb>ኩ</rb><rt>ˌ</rt>
  <rb>ነኔ</rb><rt><span style="color: red;">ˌ</span>ጸመ</rt>፡
</ruby>
```

```
<ruby class="row4ex red-miliket">
  <rb>ወ</rb><rt><span></span></rt>
  <rb>ዕ</rb><rt><span></span></rt>
  <rb>ለት</rb><rt><span>ለ፡፡</span></rt>
  <rb>፡</rb><rt><span></span></rt>
  <rb>ኩነ</rb><rt><span>፡፡</span></rt>
  <rb>ኔ</rb><rt><span></span></rt>
</ruby>
<ruby class="row3ex">
  <rb>ወ</rb><rt><span>ˌ</span></rt>
  <rb>ዕ</rb><rt><span>፡</span></rt>
  <rb>ለት</rb><rt><span>ለገ</span></rt>
  <rb>፡</rb><rt><span></span></rt>
  <rb>ኩ</rb><rt><span>ˌ</span></rt>
  <rb>ነ</rb><rt><span>ˌ</span></rt>
  <rb>ኔ</rb><rt><span>ቃ</span></rt>
</ruby>
<ruby class="row2ex red-miliket">
  <rb>ወ</rb><rt><span>__</span></rt>
  <rb>ዕ</rb><rt><span></span></rt>
  <rb>ለት</rb><rt><span></span></rt>
  <rb>፡</rb><rt><span></span></rt>
  <rb>ኩነ</rb><rt><span>ˌ</span></rt>
  <rb>ኔ</rb><rt><span>ር</span></rt>
</ruby>
<ruby class="row1">
  <rb>ወ</rb><rt></rt>
  <rb>ዕ</rb><rt></rt>
  <rb>ለት</rb><rt>ቀጽ</rt>
  <rb>፡</rb><rt></rt>
  <rb>ኩ</rb><rt>ˌ</rt>
  <rb>ነኔ</rb><rt>ጸመ</rt>፡
</ruby>
```

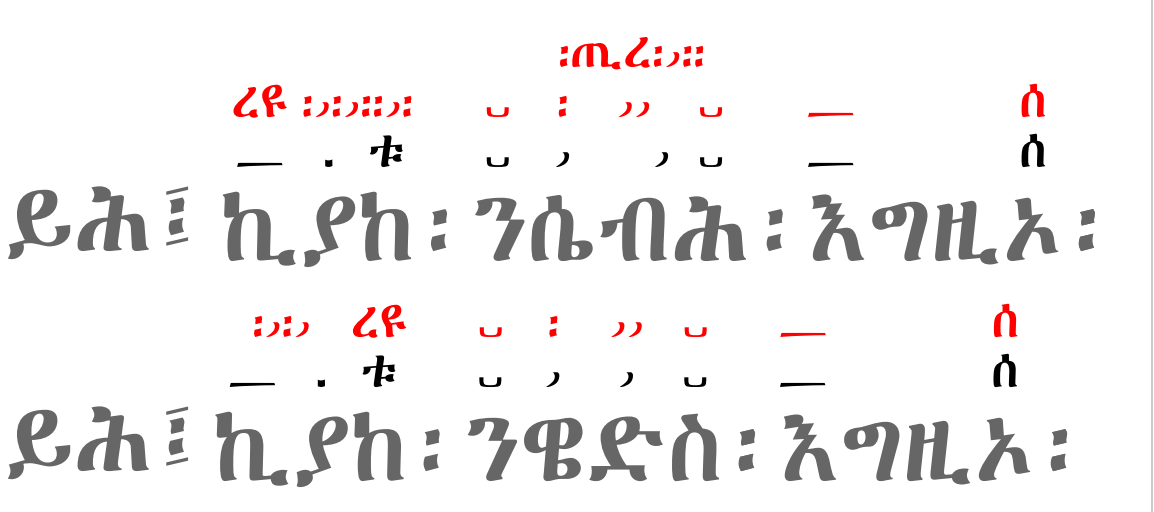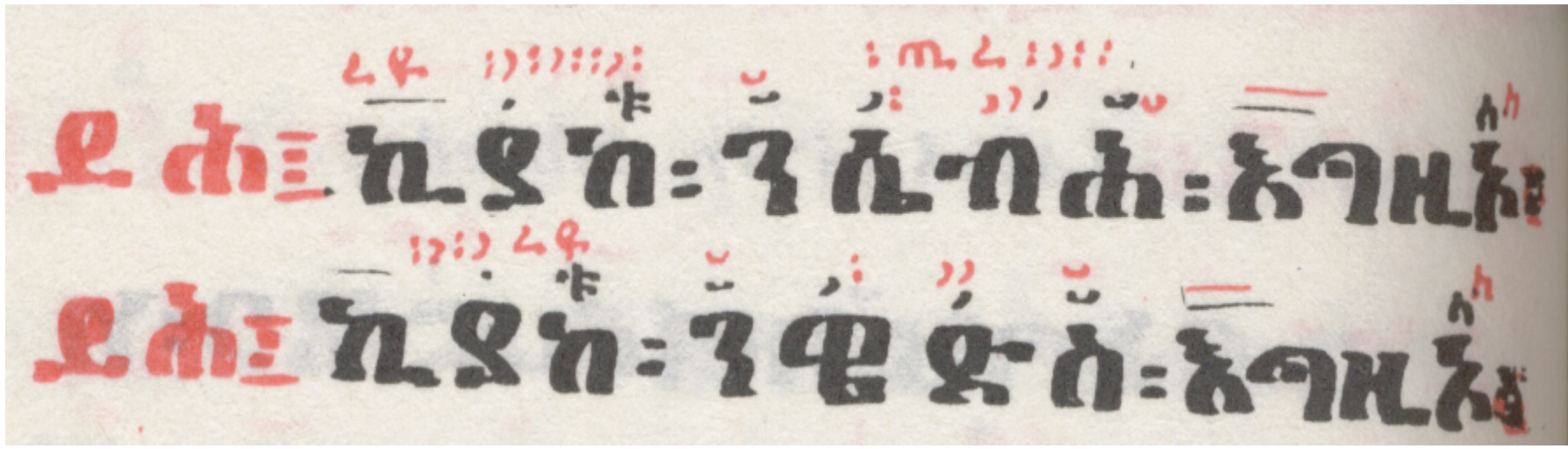**Figure 18** Merha Liqawnt

Issues:

• Unable to right align ruby-text over the final base character on rows 1, 2 and 3. Attempts were made with variations on: style="float: right; text-align: right; white-space: nowrap;"

Use Case 19

ንቅረብ፥ ለመድኃኒተ፥ ሕይወት፥

```
<ruby class="row5ex red-miliket">
  <rb>ንቅረ</rb><rt><span></span></rt>
  <rb>ብ</rb><rt><span>ነነ</span></rt>
  <rb>፥ ለመድኃኒተ፥ ሕይወት</rb><rt><span></span></rt>
</ruby>
<ruby class="row4ex">
  <rb>ን</rb><rt><span>፡</span></rt>
  <rb>ቅ</rb><rt><span>ደስ</span></rt>
  <rb>ረ</rb><rt><span>,</span></rt>
  <rb>ብ</rb><rt><span>ጥም</span></rt>
  <rb>፥ ለመድኃኒተ፥ ሕይወ</rb><rt><span></span></rt>
  <rb>ት</rb><rt><span>ጲ</span></rt>፥
</ruby>
<ruby class="row3ex red-miliket">
  <rb>ን</rb><rt><span>፡፥</span></rt>
  <rb>ቅረ</rb><rt><span>ቅጲ</span></rt>
  <rb>ብ</rb><rt><span></span></rt>
  <rb>፥ </rb><rt><span></span></rt>
  <rb>ለ</rb><rt><span></span></rt>
  <rb>መ</rb><rt><span></span></rt>
  <rb>ድ</rb><rt><span></span></rt>
  <rb>ኃ</rb><rt><span>,</span></rt>
  <rb>ኒ</rb><rt><span></span></rt>
  <rb>ተ</rb><rt><span>,</span></rt>
  <rb>፥ ሕይወ</rb><rt><span></span></rt>
  <rb>ት</rb><rt><span>ጥሮ</span></rt>፥
</ruby>
<ruby class="row2ex">
  <rb>ንቅረ</rb><rt><span>__</span></rt>
  <rb>ብ</rb><rt><span> ῆ</span></rt>
  <rb>፥ </rb><rt><span></span></rt>
  <rb>ለ</rb><rt><span></span></rt>
  <rb>መ</rb><rt><span>ʻ,</span></rt>
  <rb>ድ</rb><rt><span></span></rt>
  <rb>ኃ</rb><rt><span>ዊ</span></rt>
  <rb>ኒ</rb><rt><span></span></rt>
  <rb>ተ</rb><rt><span></span></rt>
  <rb>፥ ሕይወ</rb><rt><span></span></rt>
  <rb>ት</rb><rt><span>ለኪ</span></rt>፥
</ruby>
<ruby class="row1 red-miliket">
  <rb>ንቅረ</rb><rt><span></span></rt>
  <rb>ብ</rb><rt><span>፥ጰ</span></rt>
  <rb>፥ </rb><rt><span></span></rt>
  <rb>ለ</rb><rt><span>__</span></rt>
  <rb>መ</rb><rt><span></span></rt>
  <rb>ድ</rb><rt><span></span></rt>
  <rb>ኃኒ</rb><rt><span>,</span></rt>
  <rb>ተ</rb><rt><span>ʻ,</span></rt>
  <rb>፥ ሕይወ</rb><rt><span></span></rt>
  <rb>ት</rb><rt><span></span></rt>፥
</ruby>
```
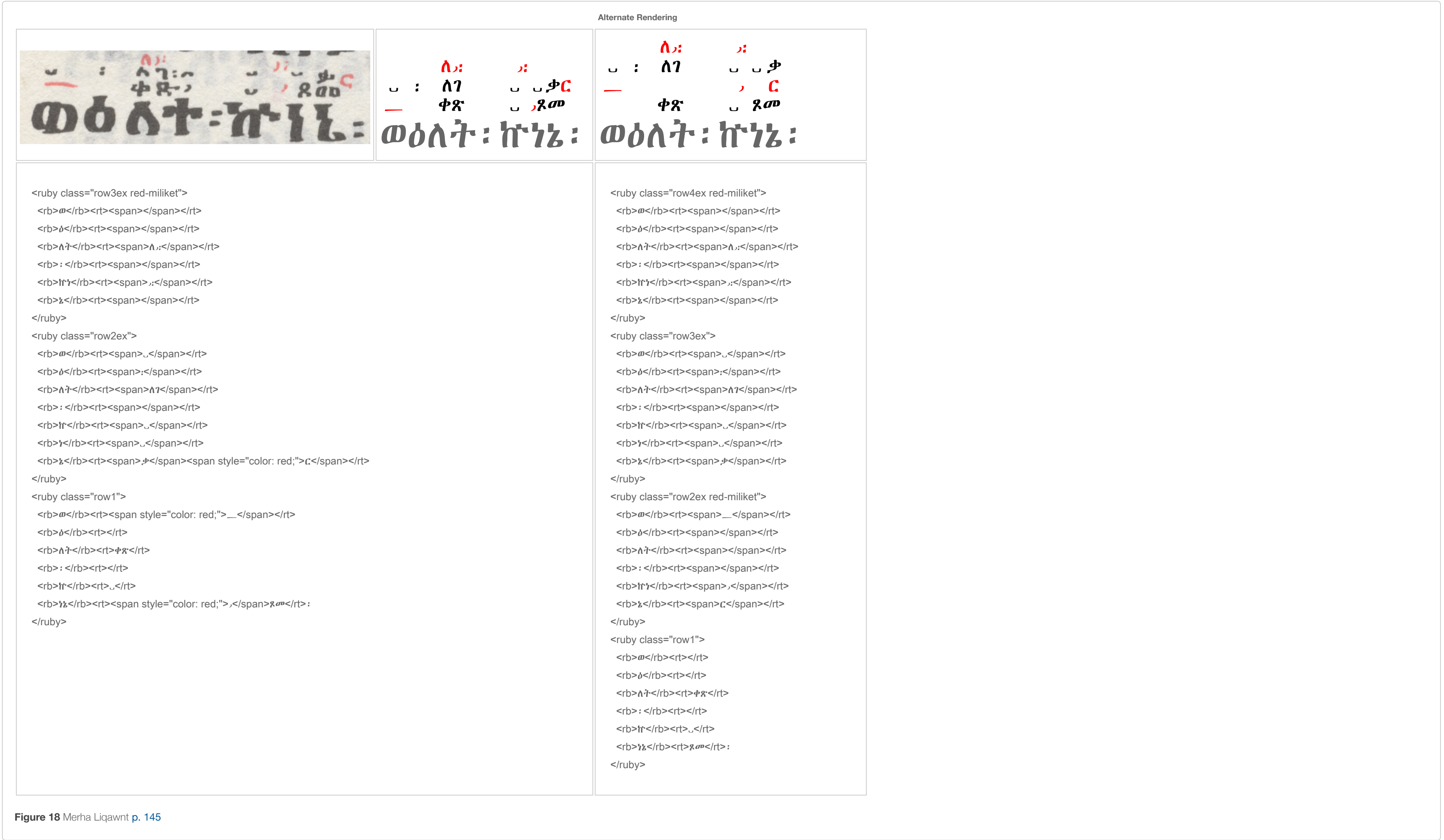
Figure 19 Selot Kidasie p. 189

Issues:

- Unable to right align ruby-text over the final base character on rows 1, 2 and 3. Attempts were made with variations on: style="float: right; text-align: right; white-space: nowrap;"

Use Case 20

ይዲ፧
<ruby class="row4ex red-miliket">
  <rb>ነ</rb><rt>፥</rt>
  <rb>ጽር</rb><rt>፧፦ራቀ፧ተ</rt>
</ruby>
<ruby class="row3ex red-miliket">
  <rb>ነ፧</rb><rt>፥</rt>
  <rb>ጽ፧</rb><rt></rt>
  <rb>ር</rb><rt>ቡ</rt>
</ruby>
<ruby class="row2ex red-miliket">
  <rb>ነጽ</rb><rt></rt>
  <rb>ር</rb><rt>፦</rt>
</ruby>
<ruby class="row1">
  <rb>ነ</rb><rt>፦፦</rt>
  <rb>ጽር</rb><rt>፦፦ራቀ፧ው</rt>፨
</ruby>

ይካ፧
<ruby class="row4ex red-miliket">
  <rb>ቅድሳት፡ለ</rb><rt></rt>
  <rb>ቅ</rb><rt>፦፦</rt>
  <rb>ዱ</rb><rt>፥፦</rt>
  <rb>ሳ</rb><rt>፦</rt>
  <rb>ን</rb><rt>ልየ</rt>
</ruby>
<ruby class="row3ex">
  <rb>ቅ</rb><rt>፦፦</rt>
  <rb>ድ</rb><rt></rt>
  <rb>ሳ</rb><rt>፦</rt>
  <rb>ት</rb><rt>ራቀ፧ው</rt>
  <rb>፡ለቅዱሳን፧ </rb><rt></rt>
</ruby>
<ruby class="row2ex red-miliket">
  <rb>ቅ</rb><rt></rt>
  <rb>ድ</rb><rt></rt>
  <rb>ሳ</rb><rt>፥</rt>
  <rb>ት</rb><rt>ቡ</rt>
  <rb>፡ </rb><rt></rt>
  <rb>ለ</rb><rt>፦፦</rt>
  <rb>ቅዱ</rb><rt></rt>
  <rb>ሳ</rb><rt>፦</rt>
  <rb>ን፧ </rb><rt style="text-align: left;">ጽራ</rt>
</ruby>
<ruby class="row1">
  <rb>ቅ</rb><rt>፦፦</rt>
  <rb>ድ</rb><rt></rt>
  <rb>ሳ</rb><rt>፦</rt>
  <rb>ት</rb><rt>፧ኃ</rt>
  <rb>፡ </rb><rt></rt>
  <rb>ለ</rb><rt>፦፦</rt>
  <rb>ቅ</rb><rt>፦</rt>
</ruby>

```
    <rb>ዱ</rb><rt></rt>
    <rb>ሳ</rb><rt>ⷂ</rt>
    <rb>ን፣ </rb><rt style="text-align: left;">ስⷃⷃ</rt>
  </ruby>
```

Figure 20 Selot Kidasie

Issues:

- Unable to right align ruby-text over the final base character on rows 1, 2 and 3. Attempts were made with variations on: style="float: right; text-align: right; white-space: nowrap;"
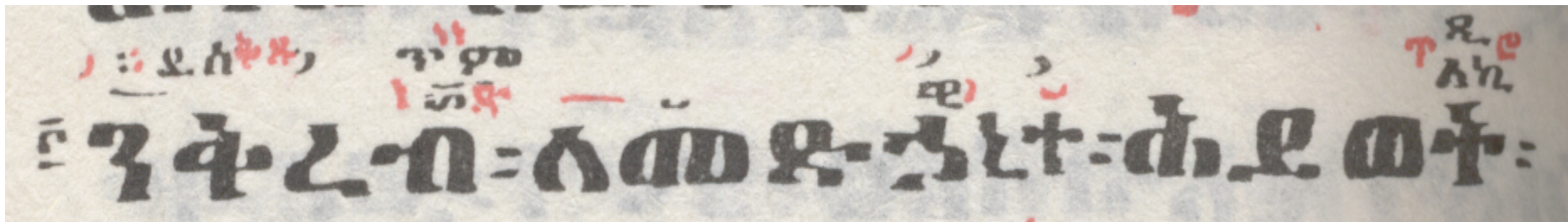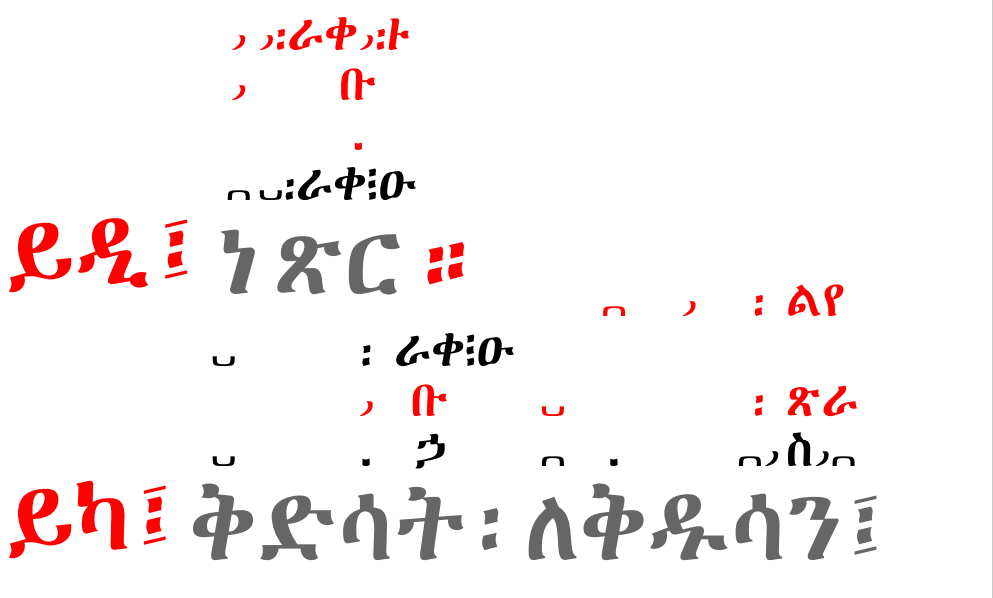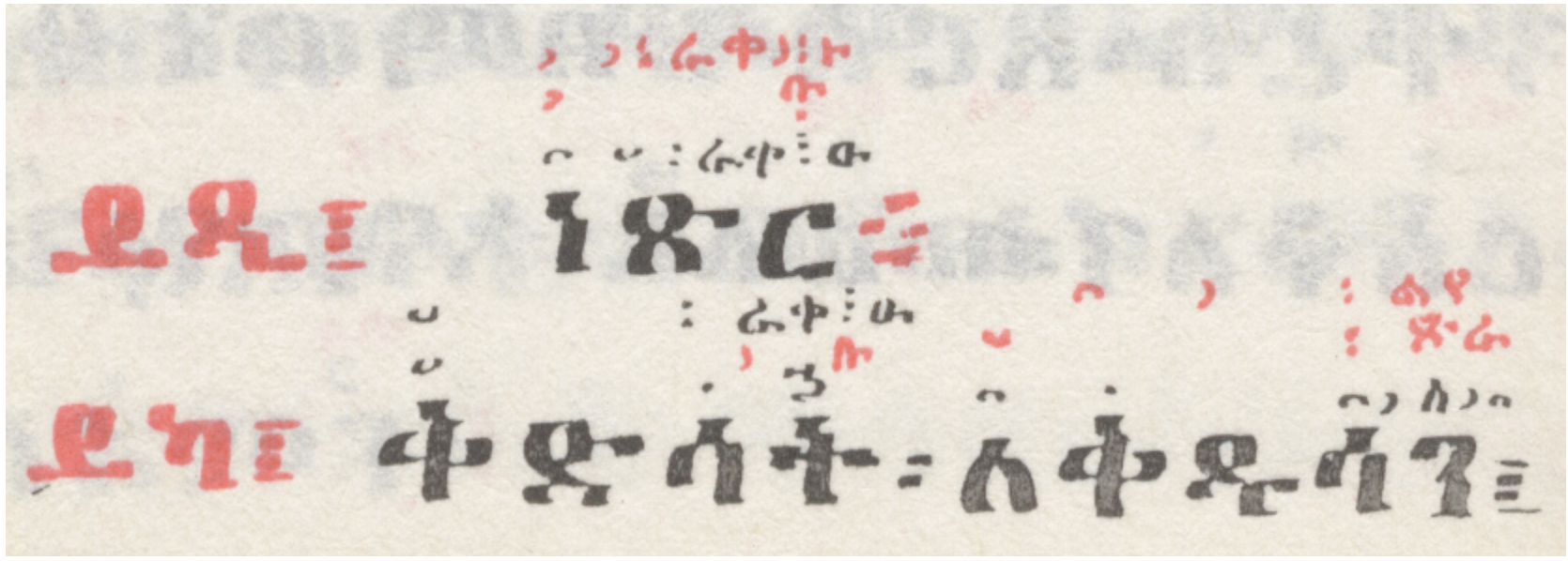
BROWSER SUPPORT

The article describes behavior for the following browser versions. We will try to update the article as behavior changes.

Browser	Version	Engine	Other browsers using that engine
Chrome	60.0.3112.113	Blink	Opera, Vivaldi, etc.

Normative References

Tu'um Lisan Kasa, ያሬድና ዜማው Yared Zeimaw, Tinsaie Zegubaie Matemiya Beit, Addis Ababa, 1981EC/1988

YeTinsaie YeMetsahft Mastemiya Dirjit, የዜማ አርዕስት ምልክት YeZaima Arist Milikt, Addis Ababa, 1983EC/1990

Birhanu Gesesse, Merigeta Dimtse, Priest and Zaima teacher at Urael Orthodox Church, Addis Ababa, 1999

Tinsaie Zegubaie Matamiya Beit, የቅዱስ ያሬድ ታሪክና የዜማ ምልክቶች YeKidus Yared Tarikna YeZaima Milketoc, Tinsaie Zegubaie Matamiya Beit, Addis Ababa, 1959EC/1966

Informative References

Afewerk Ambaw, Memhir, ቅመተ አርያም K'wumete Aryam, Bahir Dar Matemiya Beit Tateme, Bahir Dar, 1990EC/1998

Biete Kahne, መጽሐፍ ቅዳሴ ጉልሕ - በግዕዝን በአማርኛ ከነምልክቱ Metsehaf Kidasie Gwulih - BeGe'ezna BeAmarigna Kenemilketu, Addis Ababa, 1991EC/1999

Gebre-Amanuel, Like Kahnat Berhanu, ed., ጸሎት ቅዳሴ - የሕዝብ ተስጥዎ Selot Kidasie - YeHezb Tesetwo, Berhanina Selam Matemiya Dirjit, Addis Ababa, 1989EC/1997

Gebre-Amanuel, Like Kahnat Berhanu, ed., መጽሐፈ ድጓ - ዘቅዱስ ያሬድ Metsehaf Degua - ZeKedus Yared, Nigid Matemiya Dirjit, Addis Ababa, 1988EC/1995

Gebre-Amanuel, Like Kahnat Berhanu, ed., ዝማሬ ወመዋሥዕት Zimarie WeMewas'et, Berhanina Selam Matemiya Dirjit, Addis Ababa, 1986EC/1993

Gebre-Sellasie, Tesfa, ዝማሬ - ዘደረስ ቅዱስ ያሬድ Zimarie - Zederese Kidus Yared, Tesfa Gebre-Sellasie Matemiya Biet, Addis Ababa, 1976EC/1983

Habte-Mariam, Memhir Enbakom, መርሐ ሊቃውንት Merha Likawunt, Nigid Matemiya Dirjit, Addis Ababa, 1991EC/1999

Kessis Kefyalew Merahi, The Most Versative Ethiopian Scholar, St. Yared and His Outstanding Works, Commercial Printing Enterprises, Addis Ababa, April 11, 2004

Kenfe Mikael Muchei, Merigeita, አንቀጽ፡ ዘድጓ፡ ወዘጸዋትወ፡ ዜማ፡ ዘቤተልሔም Ankets Zedgwa WeZetsewatwe Zeima ZeBeitlheim, YeTinsaie YeMetsahft Mastemiya Dirjit, 1995 EC/2003

Tesema Habte Mikael Gisew, የአማርኛ መዝገበ ቃላት YeAmarigna Mezgebe Kalat Addis Ababa, 1951EC/1958

Tinsaie Zegubaie Matamiya Beit, ሥርዓት ቅዳሴ - የሕዝብ ተሠጥዎ Sirat Kidasie – YeHezb Tesetwo, Addis Ababa, 1979EC/1986

Woube Kassaye, Liturgical Music of Ethiopia, LISSAN: Journal of African Languages and Linguistics, Volume XIX Number 2, Addis Ababa, 2005

YeTinsaie YeMetsahft Mastemiya Dirjit, መዝሙር ዳዊት Mezmur Dawit, YeTinsaie YeMetsahft Mastemiya Dirjit, Addis Ababa, 1986EC/1993

YeTinsaie YeMetsahft Mastemiya Dirjit, መጽሐፈ፡ ቅዳሴ፡ (መዝገብ፡ ቅዳሴ፡ ዘደብር፡ ዓባይ) Metsihafe Kidasei (Mezigebe Kidasei ZeDebre Abay), YeTinsaie YeMetsahft Mastemiya Dirjit, Addis Ababa, 1984 EC/1991

YeTinsaie YeMetsahft Mastemiya Dirjit, መጽሐፈ፡ ዚቅ፡ ወመዝሙር Metsihaf Zik WeMezmur, YeTinsaie YeMetsahft Mastemiya Dirjit, Addis Ababa, 1979EC/1986

YeTinsaie YeMetsahft Mastemiya Dirjit, ምዕራፍ ዘቅዱስ ያሬድ Me'eraf ZeKidus Yareid, Comercial Publishing Enterprise, Addis Ababa, 1987