Nasal harmony in consonants in Chiquitano and its origins

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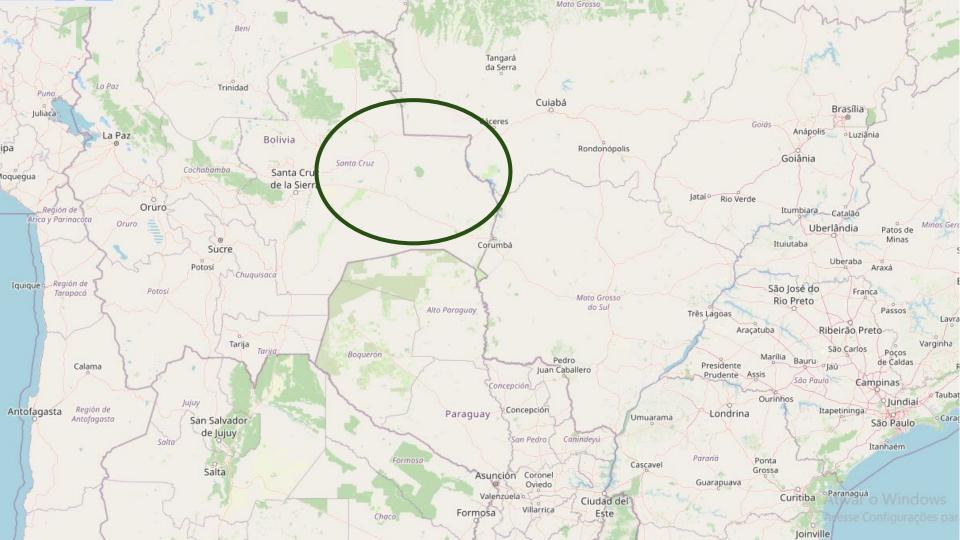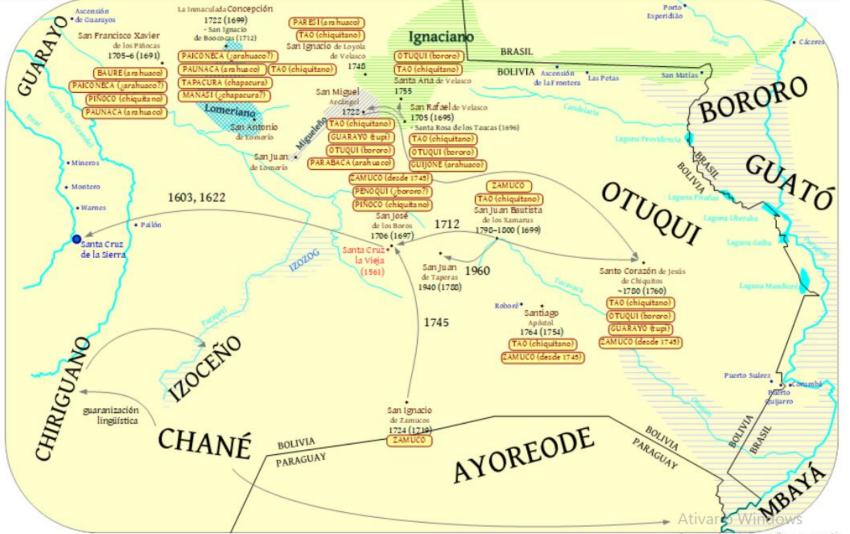
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Chiquitano

- Native to the Chiquitanía (~ Chiquitania) region of Eastern Bolivia + some villages on the Brazilian side of the border

- One of the official languages of Bolivia (under the name of **Bésɨro**)

- ~2,400 speakers (steady decline; ethnic population perhaps ~100,000)

    - NB: Some Chiquitano prefer to call themselves **Monkóka** (sg. **Monkóxɨ**)

- Formerly imposed as the *lingua franca* in the Jesuit missions (18th century)

- A divergent member of the Macro-Jê language family (Adelaar 2008)

GUARAYO

Ascensión de Guarayos

San Francisco Xavier de los Piñocas
1705–6 (1691)

BAURE (arahuaco)
PAICONECA (¿arahuaco?)
PIÑOCO (chiquita no)
PAUNACA (arahuaco)

La Inmaculada Concepción
1722 (1699)
+ San Ignacio de Boococas (1712)

PAICONECA (¿arahuaco?)
PAUNACA (arahuaco)
TAPACURA (chapacura)
MANASI (¿chapacura?)

PARESI (arahuaco)
TAO (chiquitano)

San Ignacio de Loyola de Velasco
1748

Lomeriano

San Antonio de Lomerío

Migueleño

San Juan de Lomerío

San Miguel Arcángel
1722

TAO (chiquitano)
GUARAYO (tupi)
OTUQUI (bororo)
PARABACA (arahuaco)

San Rafael de Velasco
1705 (1695)
+ Santa Rosa de los Taucas (1696)

TAO (chiquitano)
OTUQUI (bororo)
GUIJONE (arahuaco)

Santa Ana de Velasco
1755

OTUQUI (bororo)
TAO (chiquitano)

Ignaciano

BRASIL
BOLIVIA

Ascensión de la Frontera

Las Petas

San Matías

Porto Esperidião

Cáceres

BORORO

GUATÓ

BRASIL
BOLIVIA

Laguna Providencia

Laguna Piraim

Laguna Uberaba

Laguna Gaiba

Laguna Mandioré

OTUQUI

ZAMUCO (desde 1745)
PENOQUI (¿bororo?)
PIÑOCO (chiquita no)

San José de los Boros
1706 (1697)

ZAMUCO
TAO (chiquitano)

San Juan Bautista de los Xamarus
1798–1800 (1699)

1712

1960

Santo Corazón de Jesús de Chiquitos
~1780 (1760)

TAO (chiquitano)
OTUQUI (bororo)
GUARAYO (tupi)
ZAMUCO (desde 1745)

1603, 1622

Mineros

Montero

Warnes

Palón

Santa Cruz de la Sierra

IZOZOG

Santa Cruz la Vieja
(1561)

San Juan de Taperas
1940 (1788)

1745

Roboré

Santiago Apóstol
1764 (1754)

TAO (chiquitano)
ZAMUCO (desde 1745)

Tucavaca

Puerto Suárez

Corumbá

Puerto Quijarro

BOLIVIA
BRASIL

CHIRIGUANO

IZOCEÑO

guaranización lingüística

CHANÉ

BOLIVIA
PARAGUAY

San Ignacio de Zamucos
1724 (1719)
ZAMUCO

AYOREODE

BOLIVIA
PARAGUAY

BOLIVIA
BRASIL

MBAYÁ

Parapetí

Paraguai (Río Grande)

Itonamas

Candelaria

Jauru

Paraguai

Dialects

- **Bésɨro**
  - the most vital variety, spoken in the Lomerío region and in Concepción by descendants of refugees who fled from the Jesuit missions
  - the only variety that has a standard orthography

- **Migueleño**
  - a moribund variety (< 30 speakers) that I have been researching since 2017

- **Eastern** (?)
  - provisional umbrella term for the varieties spoken in San Ignacio de Velasco, Brazil, and Santiago de Chiquitos (unclear whether these lects share common innovations)

/p/ pʲ ~ c̡	/t/ t̪ʲ	/ts/	/tʃ/	/k/ kʲ ~ c̡	/ʔ/
	/ʂ/ c̡	/s/		/x/ c̡	/h/
/β/ β̡ʲ ~ j		/ɾ/	/j/	/ɰ/	
/m/ mʲ ~ ɲ		/n/	/ɲ/	/ŋ/	

/ts/: present in all dialects except Bésɨro, where it merges with /s/

    Bésɨro *n-o-sokoɾé-s* ~ Migueleño *o-tsokoɾé-s* 'seriema bird.♂'

/x/: present only in Migueleño, which shows a chain shift **/ɾ/** (_C) **> /ʂ/ > /x/**

    Bésɨro *ʂaî̃-ʃ* ~ Migueleño *xaʔĩ-c̡* 'faeces'

/h/: a marginal phoneme; present in all dialects except Bésɨro

    Bésɨro *aémo* ~ Migueleño *haémo* 'for you'

/ɰ/ and **/ŋ/**: marginal phonemes present in all dialects except Bésɨro, which has **/β/** and **/m/** instead

    Bésɨro *n-o-iβ̡ó-ʂ* ~ Migueleño *o-ɨɰó-x* 'deer.♂'

/p/	/t/	/ts/	/tʃ/	/k/	/ʔ/
pʲ ~ ɕ	t̪ʲ			kʲ ~ ɕ	
	/ʂ/ ɕ	/s/		/x/ ɕ	/h/
/β̞/ β̞ʲ ~ j		/ɾ/	/j/	/ɰ/	
/m/ mʲ ~ ɲ		/n/	/ɲ/	/ŋ/	

Progressive palatalization *i/ĩ_V* (details vary per dialect)

Bésɨro: /p β̞ m t ʂ k/ → pʲ β̞ʲ mʲ t̪ʲ ɕ kʲ
Migueleño: /p β̞ m t x k/ → ɕ j ɲ t̪ʲ ɕ ɕ

          ex.: /i-popé-xɨ/ → ɕopés 'her foot'

/u ũ/	/ɨ ɨ̃/	/i ĩ/
/o õ/	/a ã/	/e ẽ/

The nasal vowels are present in all dialects except Bésɨro. They almost always occur next to another vowel, possibly separated by a glottal stop:

Migueleño *taĩtʃó-x* ~ Bésɨro *taitʃó-ʂ* 'pus'
Migueleño *cɨmóĩt̯ʲaʔ* ~ Bésɨro *kɨmúint̯ʲa* 'in the middle'
Migueleño *coʔẽ-s* ~ Bésɨro *coéŋ-s* 'pampa field'
Migueleño *kãʔã-x* ~ Bésɨro *káŋ-ʂ* 'stone'
Migueleño *u-táĩ-maʔ* ~ Bésɨro *n-u-táu-ma* 'bird.♂'

In other environments, nasal vowels surface as VN sequences (maybe they are not underlying nasal vowels at all?), and are rare in native vocabulary

Migueleño *ĩ-ca-tɨ* [ˈĩɲcatɨ̥] 'I go away'   Migueleño *tãtó-x* [tãnˈtox] 'güembé vine'
Migueleño *űka* [ˈũŋka] 'who.♀'   Migueleño *kăpo-x* [ˈkãmpox] 'space' < Sp. *campo*
Migueleño *ĩkaʔ* [ˈĩŋkaʔ] 'there'   Migueleño *βĕta-x* [ˈβẽ̞ntax] 'shop' < Sp. *venta*

Long-distance nasal harmony

/β̞ ɾ j ɰ/ may change to /m n ɲ ŋ/ under certain circumstances

- Migueleño:

/ki**ja**ɾá-xɨ/	→	/ki**ɲ**aná-maʔa/
'fox'		'fox.DIM'
/ku**ɾu**β̞asɨ́-xɨ/	→	/ku**num**así-maʔa/
'chicken'		'chicken.DIM'
/ku**ɾ**usɨ́-xɨ/	→	/Ø-ç̞u**n**usɨ-ná-ta/
'cross'		'she is blessing her'
/tʃá**β**-o/	→	/**m**a-tʃá**m**-an-a/
'she drinks'		'she offers a drink'
/tá**ɾɨβ**-o/	→	/**m**a-ta**ním**-an-a/
'it is broken'		'she breaks'

Long-distance nasal harmony

/β̞ ɾ j ɰ/ may change to /m n ɲ ŋ/ under certain circumstances

- Eastern, San Rafael subdialect (Girard 2014)

/ose**ɰ**ó-ʂɨ/	→	/ose**ŋ**ó-**m**aʔ/
'maize'		'maize.DIM'
/**j**oː**ɾ**i-pʲakiʔó-ʂɨ/	→	/**ɲ**oː**n**i-pʲakiʔó-**m**aʔ/
'courbaril tree'		'courbaril tree.DIM'
/**β̞**-a-topí-kʲa/	→	/**m**-a-topi-**ɲ**aká-ka/
'we bathe'		'we bathe something'
/u-**β**á-ka/	→	/u-**m**a-t-**ẽ**ʔ/
'we eat'		'we eat it'
/**j**o-/	→	/**ɲ**o-tokiʔ**ã̌**ː-ʂɨ/
'their'		'their navels'

Long-distance nasal harmony

Finalmente, basta que en alguna inflexion de las declinaciones ó conjugaciones, ó en alguna formacion de tiempo ó verbo ó nombre verbal, ó en alguna composicion, etc., se incorpore con el verbo ó nombre alguna narigal ó alguna de las letras *m*, *n*, *ñ*, para que toda *b* de verbo ó nombre se mude en *m*, toda *r* en *n*, toda *y* en *ñ* : por lo cual, de *ibobica* « yo convido » se dice *imomicoê* « yo la convido » ; de *yaçaborica* « yo miro », se dice *ñaçamoniteê* « yo lo miro », por tener estos verbos, como otros muchos, *ê* narigal en su respectivo. Por razon de una *m* concurrente en formacion, se dice *iquìmonimacaca* « yo azoto », derivado del pasivo *iẕìborica* « soy azotado ». Del neutro *yeba-baca* « arrimarse », se forma el activo *iñemamacaca* « arrimar ». De *obobos*, que significa « sapo », se dice *omomo-ma* « sapito », y así de infinitos otros nombres y verbos, etc. (2). Esto pues, que es frecuentísimo en esta lengua, hace que en cada período

Colonial
(Anonymous 1718
apud Adam & Henry 1880)

i-βo̥βí̥-ka → i-**mom**i-k-oʔě̃

j-asaβo̥rí-ka → **ɲ**-asa**mon**i-t-eʔě̃

i-tsɨβo̥rí-ka → i-kɨ**mon**i-**m**aká-ka

j-eβaβá-ka → i**ɲ**-e**mam**a-ká-ka

oβo̥βó-ʂ → o**mom**ó-**m**a

Long-distance nasal harmony

/β̞ ɾ j ɰ/ may change to /m n ɲ ŋ/ under certain circumstances

- Normally nasality spreads from a nasal segment (/m n ɲ ŋ ã ĩ õ ũ ẽ ĩ/) leftwards within a morphological word

  - Loanwords may be exempt (e.g. Migueleño *aɾiβ̞iɾone* 'starch' < Sp. *almidón, ɾominú-x* 'saddle' < Sp. *lomillo*) or not (Migueleño *motóːni-ɕ* 'button' < Sp. *botón*)

- A handful of so-called Trojan roots (with a floating [+nasal] feature) exist:

  - Eastern, San Rafael subdialect (Girard 2014)

    /aβ̞-/ '2PL' → /am-ótu/ 'your.PL tongues', /am-óʔo/ 'your.PL teeth', /am-asɨ-ká-tɨ/ 'y'all look'

  - Migueleño

    /ij-/ '1SG.♂' → /iɲ-ápa/ 'my.♂ louse', /ɲ-ótu/ my.♂ tongue', /ɲ-á-ka/ 'I.♂ put'

Long-distance nasal harmony

- At least in Migueleño, /V(ʔ)i V(ʔ)ɨ V(ʔ)u/ become /V(ʔ)ĩ V(ʔ)ɨ̃ V(ʔ)ũ/ under the same conditions:

    /tso**i**j-/ '1+3' → /tso**ĩ**-tʃɨmó-ka/ 'we.EXCL sit'

    /**i**j-/ 'INV' → /a-**ĩ**-t̪ʲá̃ʔã/ 'for you to bring it'

    /jaʔ**ɨ**-/ 'young man' → /**ɲ**aʔ**ɨ̃**-maʔa/ 'boy'

    /taβ̝a**ɨ**-/ 'chicha' → /ta**ma**ɨ̃-maʔa/ 'chicha.DIM'

Progressive nasal harmony

Sans (2011) describes a rightward nasality spread (blocked by voiceless segments) for Bésɨro

- Indeed, there is a static restriction in all Chiquitano varieties, whereby **mV, nV, ɲV, ŋV**, and nasal vowels may not be followed by any of /β̞ ɾ j ɰ/, but only by **m n ɲ ŋ**:
  - Migueleño **anené-s** 'day', **rominú-x** 'saddle', **momené-s** 'comb'

- For example, verbal roots commonly end with **β̞, r** (rarely **j, ɰ**), but those that include a nasal segment (with no intervening voiceless consonant) can only end with **m, n** (rarely **ɲ**):
  - Migueleño **tʃáβ-o** 'she drinks', **aɛ̃tsor-o** 'she is lost', **ma-kã̃tar-a** 'she sings', **β̞á-tʃej-o** 'she gives', **sɨ̃ɰ-o** 'it (wood) is dry'
  - Migueleño **mánom-o** 'she sleeps', **ma-kitʃónon-o** 'she snores', **tomóen-o** 'it is tied'

- Loanwords from Spanish can be exempt:
  - Migueleño **miɲeré-s** 'Miguel', **marijá-x** 'María', **miérkuri-ɛ** 'Wednesday', **tʲaniɲére** 'Daniel. ♂' < *Miguel, María, miércoles, Daniel* (but see **rominú-x** 'saddle' < *lomillo*)

Long-distance nasal harmony

Rightward nasality spread is clearly blocked by voiceless consonants:

Migueleño:

- *ae̋tsoɾ-o*   'she is lost'
- *ma-kã̀taɾ-a*   'she sings'
- *kã̀taβó-x*   'lock'
- *matoɾí-x*   'parrot. ♀'
- *maematakúɾuts-o* 'she waits'
- *maíɕtiɾu*   'teacher. ♀'
- *omenetiβ̥o*   'how many'

Bésɨro:

- *ɲaŋkɨɾé-s*   'dragonfly'
- *n-o-tiŋkiɾí-ɕ*   'rufous hornero bird'
- *n-u-manturé-s*   'crab-eating fox'

Interim summary

Nasal harmony in consonants:

- **Targets**: /β̞ ɾ j ɰ/ + /i ɨ u/ (when part of **V_**, **Vʔ_**)

- **Outcomes**: /m n ɲ ŋ/ + /ĩ ɨ̃ ũ/

- **Triggers**: usually /m n ɲ ŋ ã ɨ̃ õ ũ ẽ ɨ̃/, but also lexically specified morphemes without any of those (Trojan roots)

- **Directionality**: right-to-left (unbounded), left-to-right (blocked by voiceless segments)

- Loanwords often exempt (not always)

Additional important fact:

- Nasal vowels are frequent only in VV and VʔV sequences in native vocabulary (that is, CṼC is a sequence found only in recent loans)

Proposal

- I propose that nasal harmony in Chiquitano originally targeted **vowels** and not consonants

- **Directionality**: regressive (unbounded), progressive (blocked by voiceless segments)

- This is more plausible from a typological point of view: nasal harmony processes are common in Eastern South America, and mostly affect vowels (in addition to triggering allophony in sonorant segments)

    ○ Maxakalí (< Macro-Jê; Silva 2020)

    ○ Mundurukuan (< Tupian; Picanço 2010)

- In Proto-Chiquitano, */β̞ ɾ j ɰ/ had the allophones *[m n ɲ ŋ] before nasal(ized) vowels (as Sans 2011 in fact proposes for Bésɨro)

Proposal

- Subsequently, all nasal vowels were **denasalized** in Chiquitano, except when they were part of VV or VʔV sequences → [m], [n], [ɲ], [ŋ] became phonemes

  */tãkõrě̃-si/ [tãkõˈnẽsɨ] → **/takoné-si/** [takoˈnes] 'sugarcane'
  */ãnẽně̃-si/ [ãnẽˈnẽsɨ] → **/anené-si/** [aneˈnes] 'day'
  */õβ-ě̃tsor-o/ [õˈmẽtsoɾo] → **/om-étsor-o/** [oˈmetsoɾo] 'they are lost'
  */βǎ̃rõβ-õ/ [ˈmãnõmõ] → **/mánomo/** [ˈmanomo] 'she sleeps'

- That way, the erstwhile nasality spread transformed into the **long-distance (consonantal) nasal harmony**.

  /ki**jar**áxɨ/   →   /ki**nan**áma?a/   < */kijará-ṣɨ/ → */kĩjãrǎ̃-β**ã̃**ʔ**ã̃**/
  'fox'   'fox.DIM'

  /tʃá**β̞**o/   →   /**m**atʃá**m**ana/   < */tʃáβ-o/ → */β̞ã-tʃǎ̃β̞-**ã̃**ɾ-ã̃/
  'she drinks'   'she offers a drink'

Proposal

- Contemporary Trojan morphemes were simply morphemes with a nasal vowel which is not part of a VV or VʔV sequence

  */-őtu/ [-ˈõtu] → Migueleño **/-ótu/** [-ˈotu̥] 'tongue'

  */ij-/ + ***/-õtu/** → ***/ĩj-őtu/** [ĩˈɲõtu] → Migueleño **/ɲ-ótu/** [ˈɲotu̥] 'my.♂ tongue'

  Compare Proto-Macro-Jê ***-ñũ₁ctôk** 'tongue' (Nikulin 2020:386)

Proposal

- In the early colonial period, Spanish /mV/, /nV/, /ɲV/ were borrowed as /β̃Ṽ/ [mṼ], /ɾ̃Ṽ/ [nṼ], /jṼ/ [ɲṼ], and Spanish /VNC/ was borrowed as /ṼC/. At this point, only progressive harmony applied, whereas the regressive was already largely inactive

  - ***ventana*** → **/β̃ẽtarã-/** + progressive harmony → **/β̃ẽtãrã-/** [mẽtãnã-] 'window'
  - ***bandera*** → **/β̃ãtera-/** [mãteɾa-] 'flag'
  - ***lomillo*** → **/roβ̃ĩru-/** + progressive harmony → **/roβ̃ĩrũ-/** [ɾomĩnũ-] 'saddle'

- Loans from Guaraní (which has nasality spread) preserve nasal(ized) vowels as such:

  - Guaraní ***tãkʷãɾ-ẽʔẽ*** → **/tãkõrẽ-/** [tãkõnẽ-] 'sugarcane'

Proposal

- In VV̰ and VʔV sequences, nasality was preserved in all dialects except Bésɨro:

  - ***/Ø-õʔõpakɨ́-ʂɨ/ ***[õʔõpaˈkɨʂɨ] or ***/Ø-õʔõpãkɨ́-ʂɨ/ ***[õʔõpãˈkɨʂɨ] > *õʔõpakɨ́x* 'her shoulder'
  - ***/ĩʂõʔẽ́-sɨ/ ***[ĩɕõˈʔẽsɨ] > *ɕoʔẽ́s* 'pampa field'
  - ***/kã́ʔã̃-ʂɨ/ ***[kãˈʔã̃ʂɨ] > *kã́ʔã̃x* 'stone'
  - ***/jã́ʔ ĩ-βã́ʔã/ ***[ɲãˈʔĩmã́ʔã] > *ɲaʔ ĩmaʔ* 'boy'
  - ***/tsõĩ-tʃ ĩβṍ-ka/ ***[tsõ ĩtʃ ĩˈmõka] > *tsoĩtʃ ĩmóka* 'we.EXCL sit'
  - ***/ã-ĩ-tã́ʔã/ ***[ã ĩˈt̠ʲ ã́ʔã] > *aĩ̯t̠ʲ ã́ʔã* 'for you to bring'
  - ***/tãβã́ ĩ-βã́ʔã/ ***[tãmãˈ ĩmã́ʔã] > *tamaĩ̯maʔ* 'chicha.DIM'

- The nasality is not clearly audible after nasal consonants: [tamaˈʔa] 'one', [maaˈtax] 'fishhook', [naaˈkiɕ] 'peanut' (maybe **/tamã́ʔã́/, /m-ã(ʔ)ã-tá-xɨ/, /nã(ʔ)ãkɨ́-ɕi/**).

Proposal

In Bésɨro, ***Ṽ?Ṽ** sequences yielded **V(V)N**, where N is equal to:

- [m] before /p/

  - ***/Ø-õ?õpakɨ́-ʂɨ/ ***[õ?õpaˈkɨʂɨ] or ***/Ø-õ?õpã́kɨ́-ʂɨ/ ***[õ?õpãˈkɨʂɨ] > ***nompakɨ́ʂ*** 'her shoulder'

- [n] before /t/, /tʃ/

  - ***/ũ-βã̰?ã̰turé-sɨ/ ***[ũmã̰?ã̰tuˈɾesɨ] > ***numanturés*** 'crab-eating fox'

Proposal

In Bésɨro, ***Ṽ\ʔṼ** sequences yielded **V(V)N**, where N is equal to:

- [ŋ] before /k/, /s/, /ʂ/, word-finally in the numeral 'one':

  - ***/rã̃ʔãkí-ʂɨ/** *[nã̃ʔã̃ˈkiɕi] or ***/rã̃ʔãkĩ́-ʂɨ/** *[nã̃ʔã̃ˈkĩɕi] > ***naŋkíɕ*** 'peanut'
  - ***/ĩ̃ʂõʔ ̃́ɛ-sɨ/** *[ĩɕõˈʔ ̃́ɛsɨ] > ***ɕoéŋs*** 'pampa field'
  - ***/βã̃ʔãká-ʂɨ/** *[mã̃ʔã̃ˈkaʂɨ] or ***/βã̃ʔãkã́-ʂɨ/** *[mã̃ʔã̃ˈkã̃ʂɨ] > ***maŋkáʂ*** 'south wind'
  - ***/kã̃ʔã́-ʂɨ/** *[kã̃ˈʔã̃ʂɨ] > ***káŋs*** 'stone'
  - ***/tãβã̃ʔ ̃́ã/** *[tãmã̃ˈʔ ̃́ã] > ***tamáŋ*** 'one'

- Ø before /m/, /n/, /ɲ/, and word-finally

  - ***/ɲã̃ʔɨ̃-βã̃ʔã/** *[ɲã̃ˈʔɨ̃mã̃ʔã] > ***ɲáɨma*** 'boy'

*/p/ *[p pʲ]	*/t/ *[t tʲ]	*/ts/ *[ts]	*/tʃ/ *[tʃ]	*/k/ *[k kʲ]	*/ʔ/ *[ʔ]
	*/ʂ/ *[ʂ ɕ]	*/s/ *[s]			*/h/ *[h]
*/β̞/ *[β̞ β̞ʲ m mʲ]		*/ɾ/ *[ɾ n]	*/j/ *[j ɲ]	epenthetic *[ɰ ŋ]	

*/u ũ/	*/ɨ ɨ̃/	*/i ĩ/
*/o õ/	*/a ã/	*/e ẽ/

*/p/ */[p pʲ]	*/t/ */[t tʲ]	*/ts/ */[ts]	*/tʃ/ */[tʃ]	*/k/ */[k kʲ]	*/ʔ/ */[ʔ]
	*/ʂ/ */[ʂ ɕ]	*/s/ */[s]			*/h/ */[h]
*/β̞/ */[β̞ β̞ʲ m mʲ]		*/ɾ/ */[ɾ n]	*/j/ */[j ɲ]	epenthetic */[ɰ ŋ]	

Oral/nasal allophony

Progressive palatalization (*i_V, *ĩ_V)

*/u ũ/	*/ɨ ɨ̃/	*/i ĩ/
*/o õ/	*/a ã/	*/e ẽ/

Conclusion

- In Proto-Chiquitano, nasal consonants *[m n ɲ] and continuants *[β̝ ɾ j] were allophones of one single series of phonemes, with the choice determined by the nasality of the nucleus

  - *[ŋ] and *[ɯ] were epenthetic segments and probably were not phonemic at all

- Nasality spread from all underlying nasal vowels leftwards (in an unbounded way) and rightwards (blocked by voiceless segments) — in a way quite similar to the neighboring Tupi–Guaranian languages

- Contemporary Chiquitano varieties mostly lost nasal vowels through denasalization, except when they formed VV or VʔV sequences

  - Early loans from Spanish and Guaraní entered the language before the latter process

- When the denasalization was complete, nasal consonants became phonemic, and nasal harmony started to be associated mostly with consonants

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