

# STAN bodyparts

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# I. Background

# Chinese, Austronesian

At the 23<sup>rd</sup> ICSTLL in Arlington, Texas, 1990, I argued that AN and Chinese are genetically related within 'SAN'



23rd International Conference on Sino-Tibetan Languages and Linguistics  
5-7 October 1990, Arlington, Texas, U.S.A.

CHINESE AND AUSTRONESIAN ARE GENETICALLY RELATED

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# Central argument: explanation of OC final glottal stop from PAN\*-q

PAN	OC
* <u>uta</u> q 'vomit'	吐 *t <sup>h</sup> ʰaʔ > <u>thu</u> X > tǔ 'eject from mouth, spit'
* <u>ta</u> q 'earth'	土 *t <sup>h</sup> ʰaʔ > <u>thu</u> X > tǔ 'earth'
* <u>pana</u> q 'shoot'	弩 *C.n <sup>h</sup> aʔ > nuX > nǔ 'crossbow'
* <u>punu</u> q 'brain'	腦 *n <sup>h</sup> [u]ʔ > nawX > nǎo 'brain'

# What of TB ?

In the early version of the proposal, only Chinese was related to AN and TB was left in limbo.

I thought then that all the words shared by Chinese and TB were loans from Chinese.

Excluding TB was an error.

I recognize that sound correspondences do exist.

and the shared vocabulary is too basic for borrowing.

Yet a good part of the observations made on Chinese and AN were real.

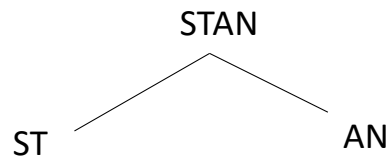
# Sino-Tibetan-Austronesian (STAN)

in 2005 I presented a revised version of my proposal, where ST as a whole was a sister to AN.

## SINO-TIBETAN–AUSTRONESIAN

An updated and improved argument

*Laurent Sagart*



# 75 lexical comparisons, three-way correspondences

Table 9.4 Correspondences of syllable-final consonants

<i>PAN</i>	<i>OC</i>	<i>TB</i>	<i>Examples</i>
-0	-0	-0	Palm of hand, chicken, carry, this, come/go
-k	-k	-k	Leech, crooked, loincloth
-t	-t	-t	Bone, hot, dig, close
-p	-p	?	Hunt, grasp
-ng	-ng	-ng	Put together, broad, cage, meet, sunlight, cave, old
-ng	-k	-ng	Horn, stopper, Setaria
-m	-m	-m/-p	Water, think, hold in fist or mouth, dark, cloud
-H <sub>1,2</sub> -q	-ʔ	-0	Head, female breast, elbow, salt, broom
	-ʔ	-k	Brain, pus, earth, lick, vomit, chew, shoot, wash, open

# sources of OC \*-ʔ (1)

#	PAN (mostly <u>Blust</u> )	PTB (STEDT, accessed June 2022)	OC (B&S 2014)
1	* <u>quluh</u> 'head'	#1221 PTB * <u>k-lu</u> HEAD	首 * <u>ʃuʔ</u> > shǒu 'head'
9	* <u>nunuh</u> 'female breast'	#253 PTB * <u>s-nəw</u> BREAST / MILK / SUCK	乳 * <u>noʔ</u> > rǔ 'milk; nipple'

PAN \*-h :: PTB (STEDT) -zero :: OC \*-ʔ



## Sources of OC \*-ʔ (2)

#	PAN	PTB (STEDT, accessed June 2022)	OC (B&S 2014)
16	* <u>siku</u> (x) 'elbow'	#307 PTB *s-g(r)u ELBOW / CUBIT (provisional)	肘 *t-[k]<r>uʔ > zhǒu 'elbow'
	* <u>inax</u> 'mother'	#1623 PTB *m-na MOTHER / FEMALE	女 * <u>nra</u> ? > nǚ 'female'
	* <u>Capax</u> 'to dry by fire'	#6638 <u>PTani</u> * <u>va</u> : ROAST IN A PAN (without adding oil) / <u>PARCH</u> (provisional)	

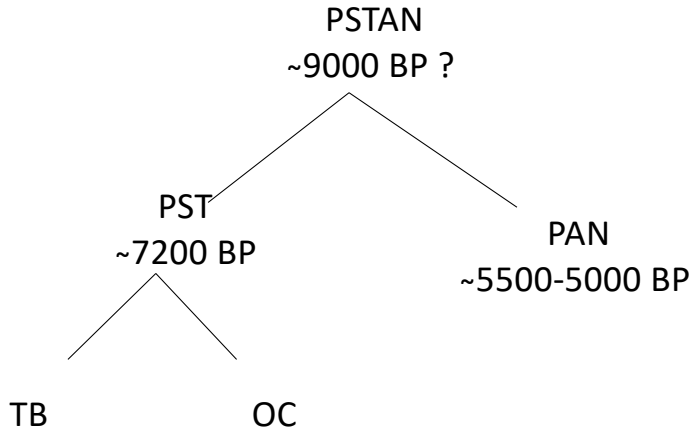
PAN \*-x :: PTB (STEDT) \*-zero :: OC \*-ʔ

## Sources of OC \*-ʔ (3)

#	PAN	PTB (STEDT, accessed June 2022)	OC (B&S 2014)
2	* <u>punuq</u> 'brain'	#243 *s-nəw-k BRAIN	腦 *nʰ[u]ʔ > nǎo 'brain'
18	* <u>nanaq</u> 'pus'	#1297 *(s/r) <u>nak</u> PUS (provisional)	(茹 *naʔ > <u>rú</u> 'putrid')
	* <u>basuq</u> 'wash'	#5645 PTB *su(k) WASH (provisional)	
	* <u>dzilaq</u> 'lick'	#629 *m- <u>lyak</u> <> *s- <u>lyak</u> <> *g- <u>lyak</u> LICK / TONGUE	舐 *Cə.leʔ > <u>shì</u> 'lick'

PAN \*-q :: PTB \*-k :: OC \*-ʔ

# STAN structure



# prehistorical hypothesis

- PSTAN assumed to have been spoken by the domesticators of foxtail millet, broomcorn millet and pigs north of the Yellow River before 9000 BP
- Period of unity ends c. 9000 BP: one group remains on site (Cishan culture 磁山文化?), another moves south of the Yellow River (Peiligang culture 裴李崗文化?)
- the northern branch = PST, splits into Sinitic and TB c. 7200
- the southern branch, ancestral to PAN, acquires rice
- then expands south and east
- reaching Taiwan C. 5500-5000 BP, becoming PAN proper.

# Domesticate names and subsistence vocabulary shared by ST and AN

## **Language Families of Southeast Asia**

Laurent Sagart

The Oxford Handbook of Early Southeast Asia

*Edited by Charles F. W. Higham and Nam C. Kim*

Print Publication Date: Mar 2022 Subject: Archaeology, Archaeology of Southeast Asia

Online Publication Date: Feb 2022 DOI: [10.1093/oxfordhb/9780199355358.013.7](https://doi.org/10.1093/oxfordhb/9780199355358.013.7)

## includes terms for

- foxtail millet
- possibly broomcorn millet
- no rice
- pig
- dog
- general agricultural vocabulary: 'to sow broadcast', 'to reap', 'seed', 'dehusked grain', 'grain as food'
- importance of fishing: 'fishnet'

# The importance of domesticate names and subsistence vocabulary

	<b>Proto-Aus-tronesian</b>	<b>Old Chinese</b>	<b>Tibeto-Bur-man</b>
<i>Setaria italica</i>	* beCeŋ	稷 *[ts]ək	Lhokpu cək, Trung tɕjaʔ <sup>55</sup>
<i>Panicum miliaceum</i>	* baCaR	稷 *[ts][a][t]-s	—
seed	* RaH <sub>1</sub> ap	粒 *p.rəp	W. Himalayish yeb-mo “to sow”
dehusked grain	* beRas	糲 *[r]at-s	PTB #b-ras rice/fruit/bear fruit (STEDT)
polished grain/ grain as food	* Semay	米 *(C.)m <sup>ʰ</sup> [e]jʔ	PTB #mey rice/ paddy (STEDT)

to toss/sow broadcast	* sabeR~*sabuR	播 *p <sup>ʰ</sup> ar-s	PTB #bwar throw away/ cast/sow/toss (STEDT)
to cut with tool/reap	* ritrit	利 *C.ri[t]-s “profit” (what is reaped)	PTB #ri:t reap/ cut/sever (ST- EDT)
pig	* beRek	(富 *pək-s “wealth”)	PTB #C.pak “pig”
fishnet	* aray	羅 *r <sup>ʰ</sup> aj “kind of net”	Wr. Tib. rgya < rya “net”

# Recent genomic work is convergent with this model

Wang et al. Genomic insights into the formation of human populations in East Asia. *Nature*. 2021 Mar; 591(7850):413-419:

**“A surprising finding is our observation that ancient North Chinese individuals are more closely related to ancient individuals of our Taiwan time transect [~1300 BCE to 800 CE ] than to early Holocene hunter-gatherers on the mainland side of the Straits of Taiwan.”**

**“Taiwanese peoples from ~1300 BCE to 800 CE carried ~25% of a northern East Asian lineage in their genomes”**

**“A speculative possibility is that this ancestry was carried by cultivators of foxtail millet—which was domesticated in the north by around 8000 bc and which, in the south, appears relatively early in the Neolithic Tapenkeng culture (around 3000–2500 bc) of Taiwan.”**

**Article**  
**Genomic insights into the formation of human populations in East Asia**

<https://doi.org/10.1038/s41586-021-03336-2>  
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Check for updates

The deep population history of East Asia remains poorly understood owing to a lack of ancient DNA data and sparse sampling of present-day people<sup>1,2</sup>. Here we report genome-wide data from 166 East Asian individuals dating to between 6000 bc and ad 1000 and 46 present-day groups. Hunter-gatherers from Japan, the Amur River Basin, and people of Neolithic and Iron Age Taiwan and the Tibetan Plateau are linked by a deeply splitting lineage that probably reflects a coastal migration during the Late Pleistocene epoch. We also follow expansions during the subsequent Holocene epoch from four regions. First, hunter-gatherers from Mongolia and the Amur River Basin have ancestry shared by individuals who speak Mongolic and Tungusic languages, but do not carry ancestry characteristic of farmers from the West Liao River region (around 3000 bc), which contradicts theories that the expansion of these farmers spread the Mongolic and Tungusic proto-languages. Second, farmers from the Yellow River Basin (around 3000 bc) probably spread Sino-Tibetan languages, as their ancestry dispersed both to Tibet—where it forms approximately 84% of the gene pool in some groups—and to the Central Plain, where it has contributed around 59–84% to modern Han Chinese groups. Third, people from Taiwan from around 1300 bc to ad 800 derived approximately 75% of their ancestry from a lineage that is widespread in modern individuals who speak Austronesian, Tai–Kadai and Austroasiatic languages, and that we hypothesize derives from farmers of the Yangtze River Valley. Ancient people from Taiwan also derived about 25% of their ancestry from a northern lineage that is related to, but different from, farmers of the Yellow River Basin, which suggests an additional north-to-south expansion. Fourth, ancestry from Yamnaya Steppe pastoralists arrived in western Mongolia after around 3000 bc but was displaced by previously established lineages even while it persisted in western China, as would be expected if this ancestry was associated with the spread of proto-Tocharian Indo-European languages. Two later gene flows affected western Mongolia: migrants after around 2000 bc with Yamnaya and European farmer ancestry, and episodic influences of later groups with ancestry from Turan.

East Asia was one of the earliest centres of animal and plant domestication, and harbours an extraordinary diversity of language families including Sino-Tibetan, Tai–Kadai, Austronesian, Austroasiatic, Hmong–Mien, Indo-European, Mongolic, Turkic, Tungusic, Koreanic, Japonic, Yukaghiric and Chukotko–Kamchatkan<sup>3</sup>. Our current understanding of the human population history in the region remains poor because of the minimal sampling of genetic diversity of present-day people on the Tibetan Plateau and southern China<sup>4</sup>, and a paucity of ancient DNA data compared with West Eurasia<sup>5–7</sup>.

We collected DNA from 383 people from 46 populations from China ( $n = 337$ ) and Nepal ( $n = 46$ ) who provided informed consent for broad studies of population history; we carried out community consultation with minority group leaders as an integral part of the consent process (see Methods, ‘Ethics statement’). We genotyped DNA using the Affymetrix Human Origins array at about 600,000 single-nucleotide polymorphisms (SNPs) (Extended Data Table 1 and Supplementary Information section 1).

For ancient individuals, we obtained permission for analysis from sample custodians, following protocols to minimize damage to skeletal material and including members of local minority groups as part of our study team when there was a plausible cultural connection between modern communities and ancient individuals (see Methods, ‘Ethics statement’). We prepared powder from bones and teeth, extracted DNA, and prepared double- or single-stranded libraries for sequencing on Illumina instruments (Methods). For most samples, we enriched the DNA for a set of about 1.2 million SNPs<sup>8,9</sup>; for the Chinese samples, we used exome enrichment (Methods, ‘Supplementary Information section 1 and Supplementary Table 1’). We sequenced the DNA and processed the data using one of two nearly identical bioinformatics procedures (Methods and Supplementary Table 2), for which we found indistinguishable results from the perspective of analyses of population history (Supplementary Table 3). We considered samples to fail screening if they had fewer than 5,000 of the targeted SNPs covered at least once; if they had a too-low rate of

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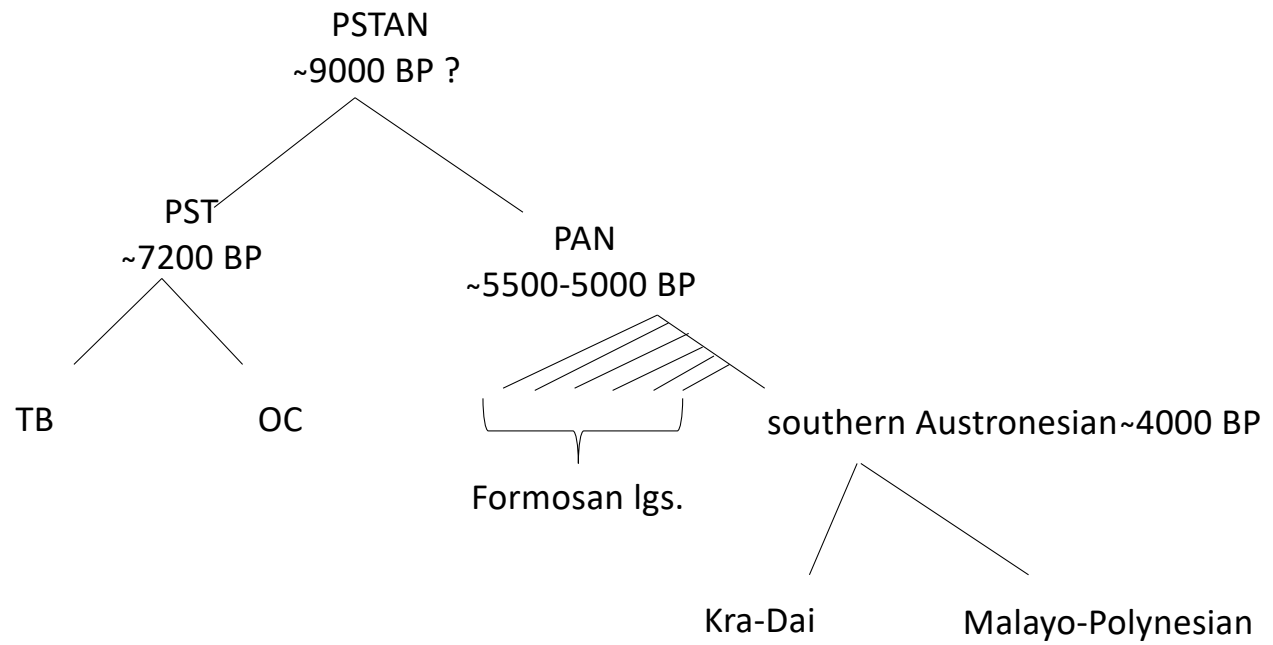
# Position of Kra-Dai

Benedict's 'Austro-Tai' is increasingly accepted

But I have argued in a series of papers that Kra-Dai is actually a **branch** of Austronesian, not a related family

Typologically reoriented through contact with Austroasiatic and with Chinese.

# STAN including Kra-Dai



# AN phylogeny including Kra-Dai

A Formosan phylogeny including Kra-Dai and Malayo-Polynesian as sister branches with all supporting evidence can be found on my blog 'Sino-Tibetan-Austronesian' <https://stan.hypotheses.org/> It relies on 40+ lexical, morphological and phonological innovations



## II. STAN bodypart terms

- 19 *human* bodypart terms are shared by Western ST and Austronesian
- Bodypart terms as a proxy for the basic vocabulary in general

# Proto-form citations

- PAN forms are either taken directly from Blust's Austronesian Comparative Dictionary (ACD),
- or are based on cognate sets assembled by others (Tsuchida, Wolff, myself), expressed in Blust's system;
- TB forms from STEDT;
- OC forms from the Baxter-Sagart 2014 reconstruction.
- None of these reconstruction systems are problem-free but they are the most recent we have for these extinct languages.

# Sagart 2005: nine bodypart terms

Table 9.1 Sixty-one basic vocabulary comparisons between AN, Chinese and TB

	<i>PAN or PECL</i>	<i>OC</i>	<i>TB</i>
1 Body hair	gumuN	眉 <sup>b</sup> mu[r] (eyebrow)	B. mul (Moshang kemul)
2 Bone	kukut	骨 <sup>a</sup> kuʔ	
3 Brain	punuq	腦 <sup>a</sup> nuʔ	B. (s-)nuk
4 Elbow	siku(H <sub>2</sub> )	肘 <sup>b</sup> t-r-kuʔ	Gyarong tkru
5 Female breast	nunuH <sub>1</sub>	乳 <sup>b</sup> noʔ	B. nuw
6 Foot	kakay		B. kriy
7 Head	quluH <sub>1</sub>	首 <sup>b</sup> hluʔ	Lushai lu
8 Palm of hand	dapa	扶 <sup>b</sup> pa	B. pa
9 Pus	nanaq		Tib. mag

#2 and 6 above are not listed as PTB in STEDT so they are absent from this presentation.

# This presentation

- nineteen bodypart terms shared by TB and AN
- twelve shared by OC and AN
- more than double from 2005



the head

#	PAN	PTB (STEDT, accessed June 2022)	OC (B&S 2014)
1	* <u>quluh</u> 'head'	#1221 PTB * <u>k-lu</u> HEAD	首 * <u>ʃuʔ</u> > shǒu 'head'
2	* <u>punuq</u> 'brain'	#243 *s-nəw-k BRAIN	腦 *n <sup>ʃ</sup> [u]ʔ > nǎo 'brain'
3	*Caŋal 'face, forehead'	#2017 PTB * <u>ŋar</u> TOPKNOT / FOREPART / FRONT SIDE	顏 *C.ŋ <sup>ʃ</sup> rar > yán 'face, forehead'
4	* <u>qimiR</u> 'cheek'	#1188 PTB * <u>s-myal</u> FACE	面 *C.me[n]-s > miàn 'face'
5	*biRbiR 'lip'	#452 PTB *b(i/u)l × * <u>byal</u> LIP / LOBE / LID	
6	(Tsuchida) * <u>Raqem</u> 'molar'	#630 PTB *gam JAW / CHIN / MOLAR	頷 *[ɕ] <sup>ʃ</sup> [ə]mʔ > hàn 'jaw, chin'
7	*- <u>tuk</u> 'nape'	#359 * <u>tuk</u> × * <u>twak</u> HEAD / SKULL / NECK	脰 *kə.d <sup>ʃ</sup> ok-s > dòu 'neck'
8	*- <u>quŋ</u> 'throat'	#3361 PTB * <u>gwaŋ</u> NECK / THROAT	膺 *q <sup>h</sup> (r)oŋ > xiōng 'breast, chest'

the trunk

#	PAN	PTB (STEDT, accessed June 2022)	OC (B&S 2014)
9	* <u>nunuh</u> 'female breast'	#253 PTB *s-nəw BREAST / MILK / SUCK	乳 *noʔ > rǔ 'milk; nipple'
10	* <u>ta-gaRaŋ</u> 'ribcage'	#288 PTB *b/g-raŋ CHEST	
11	* <u>baRaŋ</u> 'chest cavity'	#288 PTB *b/g-raŋ CHEST	
12	* <u>debdeb</u> 'chest'	#554 PTB *s-ri(p/m) RIB / SIDE	
13	*- <u>buk</u> 'belly'	#2107 *puk/buk BELLY / STOMACH	腹 *p(r)uk > fù 'belly'
14	* <u>likud</u> 'the back'	#2827 PTB *kur BACK (adv.) / BACK (body part)	

## The limbs

#	PAN	PTB (STEDT, accessed June 2022)	OC (B&S 2014)
15	* <u>pikpik</u> 'arm'	#706 IA * <u>pak</u> WING / ARM	臂 * <u>pek-s</u> > <u>bi</u> 'arm'
16	* <u>siku(x)</u> 'elbow'	#307 PTB * <u>s-g(r)u</u> ELBOW / CUBIT (provisional)	肘 *t-[k]<r>u? > zhǒu 'elbow'
17	* <u>kudkud</u> 'hoof, lower leg of an ungulate'	#414 * <u>s-kur</u> NAIL / HOOF	

‘diffuse’

#	PAN	PTB (STEDT, accessed June 2022)	OC (B&S 2014)
18	* <u>nanaq</u> ‘pus’	#1297 *(s/r) <u>nak</u> PUS (provisional)	(茹 *naʔ > <u>ru</u> ‘putrid’)
19	* <u>gumuN</u> ‘body hair’	#363 PTB *s/r- <u>mul</u> × *s- <u>mil</u> × *s- <u>myal</u> HAIR / FUR / FEATHER	

# How words align

The main syllable in TB and OC reconstruction corresponds to the final syllable of AN words:

PAN *-buk 'belly'	#2107 *puk/buk BELLY / STOMACH	腹 *p(r)uk > fù 'belly'
PAN *biRbiR 'lip'	#452 PTB *b(i/u)l 𠵿 *byal LIP / LOBE / LIP	
PAN *gumuN 'body hair'	#363 PTB *s/r-mul 𠵿 *s-mil 𠵿 *s-myal HAIR / FUR / FEATHER	
PAN *quluh 'head'	#1221 PTB *k-lu HEAD	首 *!uʔ > shǒu 'head'

# What of the first AN syllable ?

At times reflected without the vowel in the TB preinitial

in particular *when the last syllable begins in a liquid*

#	PAN (mostly Blust)	PTB (STEDT, accessed June 2022)	OC (B&S 2014)
1	* <u>g</u> uluh 'head'	#1221 PTB * <u>k</u> -lu HEAD	首 * <u>!</u> u? > shǒu 'head'
10	* <u>ta</u> - <u>g</u> aRaŋ 'ribcage'	#288 PTB * <u>b</u> / <u>g</u> -raŋ CHEST	
11	* <u>b</u> aRaŋ 'chest cavity'	#288 PTB * <u>b</u> / <u>g</u> -raŋ CHEST	
	* <u>b</u> eRaŋ 'dehusked grain'	#2071 PTB * <u>b</u> -raŋ RICE / FRUIT / BEAR FRUIT / ROUND OBJECT	糲 * <u>[r]</u> at-s > <u>l</u> ejH > lì 'dehusked but not polished grain'

# Preservation of AN first syllable in other contexts is less common

#	PAN	PTB	OC (B&S 2014)
16	* <u>siku</u> (x) 'elbow'	#307 *s-g(r)u ELBOW / CUBIT (provisional)	肘 *t-[k]<r>u? > zhǒu 'elbow'
19	* <u>gumu</u> N 'body hair'	PTB * <u>g-mul</u> HAIR (body) ( <u>Matisoff</u> 2003)	



Pre-initial \*s- before sonorants in STEDT reconstructions does not correspond to anything in PAN

#	PAN	PTB (STEDT, accessed June 2022)	OC (B&S 2014)
2	* <u>punuq</u> 'brain'	#243 * <u>s</u> -nəw-k BRAIN	腦 *n <sup>ʰ</sup> [u]ʔ > nǎo 'brain'
4	* <u>qimiR</u> 'cheek'	#1188 PTB * <u>s</u> -myal FACE	面 *C.me[n]-s > miàn 'face'
9	* <u>nunuh</u> 'female breast'	#253 PTB * <u>s</u> -nəw BREAST / MILK / SUCK	乳 *noʔ > rǔ 'milk; nipple'
18	* <u>nanaq</u> 'pus'	#1297 *( <u>s/r</u> )nak PUS (provisional)	(茹 *naʔ > rú 'putrid')
19	* <u>gumuN</u> 'body hair'	#363 PTB * <u>s/r</u> -mul × *s-mil × * <u>s</u> -myal HAIR / FUR / FEATHER	

The STEDT reconstructs \*s- to explain voiceless sonorants in modern languages, even without direct evidence for a sibilant preinitial  
Voiceless sonorants can be devoiced by any voiceless consonant

- The sound correspondences presented in 2005 have held up well
- allowing for changes from the Sagart 1999 OC system to Baxter-Sagart 2014
- Here I discuss newly uncovered facts about the ST correspondences for PAN: \*j and \*d

# 1. PAN \*j

The standard phonetic interpretation of PAN \*j is [gʲ]

My early work had led me to expect ST stops opposite AN stops

I expected to find comparisons with g-/k- in ST

I could not find any satisfactory comparison

Attractive comparisons with OC \*n-, PTB \*n- have turned up instead:

# PAN \*j :: TB \*n :: OC \*n

#	PAN	PTB (STEDT, accessed June 2022)	OC (B&S 2014)
	* <u>sejep</u> 'enter'#7309	#2517 PTB *s- <u>n(i/u)(:)</u> p/m × *r/s- <u>nyan</u> /m PINCH / SQUEEZE / PRESS / OPPRESS / SUBMERGE / SINK INTO / WEST / LOW / SOFT	入 * <u>n[u]</u> p > <u>nyip</u> > <u>rù</u> 'enter'
	* <u>ajem</u> 'heart, mind: seat of thought processes'	#5554 PTB *s- <u>nyam</u> THINK (provisional)	恁 * <u>n[ə]</u> m? > <u>nyimX</u> > <u>rèn</u> 'think'
	root *- <u>jip</u> 'to clasp, pinch'	#2517 PTB *s- <u>n(i/u)(:)</u> p/m × *r/s- <u>nyap</u> /m PINCH / SQUEEZE / PRESS / OPPRESS / SUBMERGE / SINK INTO / WEST / LOW / SOFT	攝 * <u>ke.nep</u> > <u>syep</u> > <u>shè</u> 'catch, gather up'
	* <u>Suaji</u> 'younger sibling'	#5601 PTB * <u>nyey</u> YOUNGER SIBLING	—
	* <u>ujun</u> 'nose'	Kaman (Deng) min <sup>55</sup> <u>nion</u> <sup>35</sup> nose Thanphum (Kuki-Chin) rə` <u>hnon</u> <sup>5</sup> nose Sengmai (Sal) sənūŋ nose Achang (Longchuan) (B-L- <u>nɔŋ</u> <sup>55</sup> 'nose' #2100 PTB * <u>nwan</u> MOUTH	—

## PAN \*j

- was probably a nasal, [ɲ], from pre-PAN \*n palatalized after a front vowel
- with fortition to [ɲʑ] and [ɲ<sup>dz</sup>]
- as in Sardinian dialects: Lat. *vinea* > Campidanese *bingia*, Logudorese *bindza*
- followed loss of the nasal component
- Several Formosan languages reflect \*j as n.

## 2. Sagart 2005: PAN \*d- :: TB t- :: OC t-

Two examples: 'old' and 'this'.

This correspondence cannot explain the cases where PAN \*d (in Blust's system) corresponds to TB \*r, OC \*r:

PAN \*d :: TB \*r :: OC \*r

#	PAN	PTB (STEDT, accessed June 2022)	OC (B&S 2014)
14	*likud 'the back'	#2827 PTB *kur BACK (adv.) / BACK (body part)	
17	*kudkud 'hoof, lower leg of an ungulate'	#414 *s-kur NAIL / HOOF	
	*demdem 'gloom, darkness'	#2624 PTB *r(u/i)m DARK / SHADE / DUSK / TWILIGHT	
	*dadān 'old, of things'	#7189 PTB *rar OLD	
	*qapid 'braid, twine'	#2188 PTB *(b/p)yar AFFIX / PLAIT / SEW / BRAID	辦 *m-p <sup>h</sup> e[r]? biàn 'braid (v., n.)

# Explanation

<u>Blust</u> PAN	Ross PAN (2015)	TB
	*d	t- ?
*d	*D	
	*Z	r



while my two examples of PAN \*d :: TB t- ::  
OC \*t in my 2005 paper

are ambiguous for \*d, \*D and \*Z  
and may well reflect PAN \*d or \*D

# conclusion

- This presentation more than doubles the number of bodypart comparisons shared by AN and ST
- lexical evidence relating PTB and PAN stronger than for PAN : OC
- Sound correspondences presented in 2005 have held up well
- Increase in number of comparisons has allowed progress on sound correspondences
- Support from subsistence vocabulary: names of domesticates, general agricultural vocabulary, the fishnet
- Convergence with recent work in genomics

Evidently much remains to understand

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