

**Comparative study of the Tupari branch of the Tupi family:
contributions to understanding its historical development and
internal classification**

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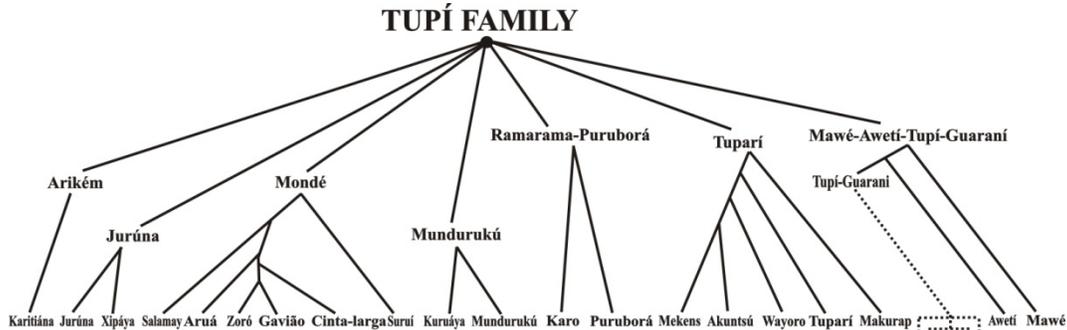
1. Introduction

The Tupi linguistic family is one of the largest linguistic groups spoken in South America, and it is composed of ten smaller branches that together comprise about 45 languages (not counting the difference among dialects spoken by distinct ethnic groups): Arikém, Mondé, Puruborá, Ramarama, Tupari, Mundurukú, Jurúna, Awetí, Mawé (Sateré), and Tupí-Guaraní. The first five of these families are spoken exclusively in the current state of Rondônia, Brazil, which, because of the time depth of the Tupi diversity there, has, for many years, often been considered as the original “homeland” for the Tupi languages (Métraux, 1928; Rodrigues, 1964). Figure 1 below presents a schematic graph of the genetic relationship and subclassification among the 10 branches of Tupi. This graph reflects previous comparative works on Tupi (Moore and Galucio, 1994; Rodrigues, 1964, 1980, 1984/1985, 2002, 2005, 2007; Rodrigues and Dietrich, 1997), but it especially includes new information for internal subgroupings inside the large Tupi family (Drude, 2006; Gabas Jr., 2000; Galucio and Gabas Jr., 2002, Moore, 2005; Moore and Galucio, 1994; Picanço, 2010; and the preliminary findings presented in section 2.3 below) that reflects more recent results of the Tupi Comparative Project ongoing at the Museu Goeldi, in cooperation with Tupi specialists from various institutions, since 1998.¹

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¹ The permanent members of the informal Tupi Comparative Project are Ana Vilacy Galucio for the Puruborá and Tupari branches; Carmen Rodrigues for the Juruna branch; Denny Moore for the Mondé branch; Gessiane Picanço for the Munduruku branch; Luciana Storto for the Arikém branch; Nilson Gabas Jr. for the Ramarama branch; Sebastian Drude for Aweti branch and also Paraguayan Guaraní (Tupí-Guarani); and Sérgio Meira for the Mawé branch. Other members that have collaborated with specific languages include Didier Demolin for Wayoro, and Mariana Lacerda for Surui of Rondônia.

Figure 1. Internal classification of the Tupi family (based on the Tupi Comparative Project)²



This paper presents the results of recent comparative studies within the Tupari branch of the Tupi family. In section 2, we give a brief overview of the Tupari branch and languages, introduce our comparative corpus and discuss the application of a lexicostatistic analysis to the Tupari languages. Section 3 focuses on the phonological comparison and reconstruction of the ancestral language, Proto-Tupari, highlighting the differences between the current work and Moore and Galucio’s (1994) proposal. In section 4, we add comparative analysis and reconstruction of morphosyntactic aspects of the Tupari languages, especially the personal pronominal markers, and the valence and category changing morphemes (causative, intransitivizer, and nominalizer). We close the paper in section 5 with a discussion of the challenges we met in our attempt at an internal classification of the Tupari family according to the phonological and morphological processes of linguistic change identified in our comparison.

2. Overview of the Tupari branch

The Tupari branch is composed of the languages Akuntsú, Makurap, Mekens, Tupari, and Wayoro, all of them spoken in the state of Rondônia (Brazil), in different indigenous territories (*Terras Indígenas – TI*) and municipalities. The current location of the five Tupari groups are indicated on the map (figure 2): (1) Terra Indígena Rio Omere, which is the area of the Akuntsú speakers, (3) Terra Indígena Rio Mekens, where the Mekens live, (5) Terra Indígena Rio Branco, where there are Makurap and Tupari speakers, and (6) Terra Indígena Rio Guaporé where we find Wayoro, Makurap and Tupari speakers.

² The dotted lines under the Tupi-Guaraní node indicate that the complete list of languages does not fit into the reserved space in the diagram, and that we regard the validity of the differing classifications of its subgroupings as still unresolved.

Figure 2. Map of Rondônia, with indication of indigenous reserves (by Willem Doelman, in van der Voort 2004).



The study of the Tupari branch and the reconstruction of its historical development play a crucial role for the reconstruction of Proto-Tupi, since, besides Tupí-Guarani, it is the Tupian family with the most individual languages still spoken today. The Tupari languages also show a level of diversity among them that suggests a considerable time depth of divergence.

The first comparative study of the Tupari languages was done by Moore and Galucio (1994). They proposed a reconstruction of the consonants and vowels of the proto-language of the branch, Proto-Tupari. After that, there have been only two related publications, which are restricted to comparing the Tupari language (not other languages of the Tupari branch) to languages of the Tupi-Guarani branch (Alves 2002, Rodrigues 2002).

In the last years, a number of descriptive works on all five languages of the branch have appeared: on Makurap (Braga 1992, 2005), Mekens (Galucio 2001, 2002, 2011), Tupari (Alves 2004, Seki 2002), Akuntsú (Aragon 2008; Aragon and Carvalho, 2007), and Wayoro (Nogueira 2010, 2011). These new sources have enabled us to conduct further phonological and morphosyntactic comparative research, significantly improving our understanding of the Tupari languages (Galucio and Nogueira 2007, Nogueira 2007, 2008; Nogueira and Galucio, *to appear*).

2.1 The Tupari languages

2.1.1 Akuntsú

There are only five people left of the Akuntsú population, according to the 2010 FUNASA's³ report (ISA, 2012). These five Akuntsú speakers are the survivors of a genocide that took place in the last decade of the 20th century, and which was responsible for the drastic decimation of the people. The Akuntsú now live in the Terra Indígena Rio

³ FUNASA stands for *Fundação Nacional de Saúde*, the Brazilian Government agency responsible for providing health care for the indigenous population.

Omerê (Rondônia), together with a small group of Kanoê (isolate) speakers, and under constant care of the National Foundation for Indigenous Affairs (FUNAI).

The Akuntsú is the most understudied of the Tupari languages. In addition to a brief paper discussing the Akuntsú status as an independent language or as a dialect of Mekens (Gabas Jr., 2005), there is only a short paper touching on phonetic properties of Akuntsú vowels (Aragon and Carvalho, 2007), and a Master's thesis that describes some aspects of Akuntsú phonetics, phonology, morphology, and syntax (Aragon, 2008).

2.1.2 Makurap

The Makurap population totals 478 people, according to FUNASA's 2010 report (ISA, 2012). They live in two indigenous territories in the state of Rondônia: *Terra Indígena Rio Branco*, and *Terra Indígena Rio Guaporé*. There is no exact information on the number of speakers in the Terra Indígena Rio Branco, as for the Terra Indígena Guaporé, where the great majority of the Makurap live, a careful survey by Denny Moore in 2010 counted 30 fluent Makurap speakers, aside from 26 semi-fluent speakers and 63 passive bilinguals. Braga has done descriptive work on Makurap phonology and morphosyntax (Braga, 1992, 2005).

2.1.3 Mekens

The Mekens population (auto-identified as Sakurabiat) totals 161 people, living in the *Terra Indígena Rio Mequens*, according to FUNASA's 2010 report (ISA, 2012). The last survey done by Galucio in 2010 counted 23 fluent speakers of Mekens. The new generation is not learning the language. There is a description of Mekens phonology and morphosyntax (Galucio, 2001), a collection of traditional narratives (Galucio, 2006), and a number of papers on specific grammatical topics, by the same author.

2.1.4 Tupari

The Tupari population adds up to 517 people, living principally in the *Terra Indígena Rio Branco*, with some in the *Terra Indígena Rio Guaporé* (FUNASA, 2010 apud ISA, 2012). There are speakers of the language in both areas, but we only have information about the latter, where there are seven fluent speakers, eight semi-fluent speakers, and fifteen passive bilinguals. The major source of information about Tupari are Alves (2004) and Seki (2002) for phonology and morphology, and a literacy book (Seki, 2003).

2.1.5 Wayoro

The Wayoro now number 215 people, living in the *Terra Indígena Rio Guaporé*, and in the town of *Rolim de Moura do Guaporé*. Nowadays there are only five fluent speakers of Wayoro, together with another three semi-fluent speakers and eight passive bilinguals, and there has been no transmission of the language to the new generations, who now learn Portuguese as their first language. With regard to linguistic studies, two Master's theses about the phonology and morphosyntax of Wayoro were concluded recently (Nogueira, 2011; Santos, 2010).

2.2. Phonological charts in the five Tupari languages

For the definition of consonants and vowels in the five Tupari languages, we generally adopted the phonological charts presented by the principal researchers of these languages. There are a few cases where our data and/or the data supplied in the consulted material indicated a different possibility of analysis. In these cases, we adapted the charts in order to reflect this situation.

2.2.1 Akuntsú

Aragon (2008) posits a series of 11 consonantal phonemes for Akuntsú, as shown in table 1.

Table 1: Akuntsú consonants (Aragon, 2008)⁴

	Bilabial	Alveolar	Alveopalatal	Palatal	Velar	Labiovelar	Glottal
Plosive and Affricate	p	t	tʃ		k		ʔ
Nasal	m	n			ŋ		
Approximant		r		j		w	

According to Aragon (2008), the labiovelar consonants are analyzed as allophones of the phoneme /w/. For instance, the word for ‘speak’ is transcribed phonologically as /ɛrewa/, but phonetically as [ɛrek^wa]. The Akuntsú data we examined (Aragon, 2008; and a lexical list collected by Gabas Jr.) suggests the existence of a labiovelar series of phonemes⁵. Thus, based on the distribution of [k^w], [g^w], and [w] in Akuntsú, and on the groups of correspondences in the five Tupari languages, a labiovelar consonant /k^w/ in the phonological chart seems justified, as indicated in table 2 below. The labiovelar consonant [k^w] of Akuntsú corresponds regularly to labiovelar consonants in the other Tupari languages that have this series.

Table 2: Suggested revision of Akuntsú consonant chart

	Bilabial	Alveolar	Alveopalatal	Palatal	Velar	Labiovelar	Glottal
Plosive	p	t			k	k ^w	ʔ
Affricate			tʃ				
Nasal	m	n			ŋ		
Tap		r					
Approximant				j		w	

⁴ We kept the classification of the consonants in the phonological charts as they were presented in the original work cited.

⁵ According to Aragon (2008:49), the phones [k^w], [g^w] and [w] are allophones of the phoneme /w/ and are distributed as follows: a) in the beginning of the word [k^w], [g^w] and [w] are in free variation, as in ‘to fly’ [k^waka] ~ [g^waka] ~ [waka]; b) [kw] and [gw] also alternate in intervocalic environment, as in ‘peanuts’ [ara^kwi] ~ [ara^gwi]; c) [w] occurs in other environments, as in ‘bird (sp.)’ [watawa] and ‘fly (sp.)’ [awi^ab]. Note that the data in (c) also include environments described in (a) and (b), showing possible contrast.

2.2.2 Makurap

Braga (1992) presents a chart of 10 consonants for Makurap. The relevant difference with Akuntsú is that Makurap does not have the glottal and labiovelar stops. The other differences with Akuntsú in the chart are just visual differences due to the form of presentation.

Table 3: Makurap Consonants (Braga, 1992)

	Bilabial	Alveolar	Alveopalatal	Palatal	Velar
Plosive	p	t			k
Nasal	m	n			ŋ
Affricate			tʃ		
Tap		r			
Approximant	w			j	

2.2.3 Mekens

Galucio (2001) posits 14 consonantal phonemes for Mekens. The major differences with Akuntsú and Makurap are the inclusion of two voiced plosives, an alveolar fricative, and a nasal labiovelar, as well as the absence of an affricate.

Table 4. Mekens consonants (Galucio, 2001)

	Bilabial	Alveolar	Palatal	Velar	Labiovelar	Glottal
Plosive	p b	t		k g	k ^w	(ʔ)
Nasal	m	n		ŋ	ŋ ^w	
Fricative		s				
Tap/liquid		r				
Approximant/Glide			j		w	

2.2.4 Tupari

Alves (2004) also presents a chart composed of 14 consonants for Tupari. Similarly to Makurap, there are no labiovelar consonants. In addition to the affricate also seen in Akuntsú and Makurap, Tupari has two fricatives: an alveolar /s/ like Mekens, and a glottal /h/, which does not appear in the other languages. In the voiced stop series only the bilabial /b/ appears.

Table 5. *Tupari consonants (Alves, 2004)*

	Bilabial	Alveolar	Alveopalatal	Palatal	Velar	Glottal
Plosive	p b	t			k	ʔ
Nasal	m	n			ŋ	
Fricative		s				h
Affricate			tʃ			
Approximant	w	r		j		

2.2.5 Wayoro

Nogueira (2011) describes 14 consonantal phonemes for Wayoro. It shows a complete series of labiovelar consonants, including the voiced stop /g^w/. In the nasal series, there is a palatal nasal /ɲ/, which corresponds to the palatal approximant in the other languages. The choice of /ɲ/ to represent the phoneme in this case reveals only a difference of analysis in the representation, since the allophones of that phoneme are similar in all five languages. Wayoro shows the affricate /tʃ/ also present in Akuntsú, Makurap, and Tupari. The bilabial fricative /β/ corresponds to the approximant /w/ in the other languages. In the voiced stop series, only the velar and labiovelar occur.

Table 6. *Wayoro consonants (Nogueira, 2011)*

	Bilabial	Alveolar	Alveopalatal	Palatal	Velar	Labiovelar
Plosive	p	t			k	k ^w
Nasal	m	n		ɲ	ŋ	ŋ ^w
Affricate			tʃ			
Tap		r				
Fricative	β					

2.2. Comparative corpus

Since Moore and Galucio's (1994) seminal reconstruction of Proto-Tupari, more lexical and morphosyntactic data for the five Tupari languages became available. In order to revise that first reconstruction, we compiled an extended comparative database that allowed for more extensive phonological and morphosyntactic research on the Tupari branch. We added new lexical material for the four languages compared in Moore and Galucio's work, and included data for Akuntsú, which was not known back in 1994.

The sources for our comparative database were the following: for Akuntsú, a lexical list recorded by Nilson Gabas Jr. in 1995, and Aragon's (2008) Master's thesis; for Makurap, Tupari, and Wayoro, lexical lists from the Museu Goeldi's archive, in addition to information provided by Nogueira from her field notes for Wayoro; for Mekens, the Mekens database compiled by Galucio, from her own field research.

We compiled a comparative database for the Tupari branch that comprises 857

lexical items, although the lexical list has not been completed for all five languages. We counted as an entry those lexical items that are filled in for at least two of the five languages. The number of entries for each language is as follows: 253 lexical entries for Akuntsú, 371 for Makurap, 387 for Wayoro, 525 for Tupari, and 798 for Mekens.

From those 857 lexical entries in the comparative database, 258 items were identified as cognates, again not all of them are present in all the languages. The distribution of these cognate sets is: 73 cognate sets in only two languages, 68 cognate sets in three of the languages, 63 cognate sets in four languages, and 54 cognate sets in all five languages. We computed all of these sets in our final list of cognates, adding up to the total of 258 items.

With the addition of the new material, the current list of cognate sets has 133 more lexical entries than the list used in the previous reconstruction of Proto-Tupari (Moore and Galucio, 1994), which had only 125 cognate sets. The number of cognate sets was considerably augmented for all the languages, as can be observed in table 7, which shows a comparison between Moore and Galucio’s list of cognates and our current list.

Table 7. Number of cognate sets for the Tupari languages

	Moore and Galucio (1994)	Our current list
Akuntsú	0	158
Makurap	87	198
Mekens	93	235
Tupari	93	235
Wayoro	111	231

2.3. Lexicostatistic comparison of the Tupari languages

The genetic relation of the five Tupari languages has been assessed before (Hanke *et al.*, 1958; Rodrigues, 1964; Moore and Galucio, 1994; Cabral and Aragon, 2005; Gabas Jr., 2005), but the internal classification of the family is still unclear.

We applied a basic lexicostatistical analysis in order to evaluate the percentage of shared vocabulary among all five languages. Due to limits of space we present only a summary of this lexicostatistical comparison here, a complete analysis is the subject of another paper in progress. We extracted from our comparative corpus, a “Swadesh List” based on the list of 100 items proposed by Morris Swadesh (1955) as the basic vocabulary more resistant to borrowing and relatively more stable over time. The lexicostatistical principles as defined by Swadesh (1955) states that the percentage of shared retentions in the basic vocabulary can be seen as an indication of the degree of genetic relationship among the languages under consideration.

For this work, the analytical procedures we followed included completing the Swadesh list for the five Tupari languages, identifying the cognate sets for each entry, and applying statistical analysis to calculate the percentage of shared cognates for each pair of languages (table 8). The higher the number of shared vocabulary, the closer the two languages are proposed to be.

Table 8. Tupari branch: Percentage of cognates (Swadesh list of 100 diagnostic words)

	Akuntsú			
Mekens	79	Mekens		
Wayoro	71	65	Wayoro	
Tupari	66	53	64	Tupari
Makurap	51	50	49	47

The general result is that almost all the languages in the family share 50% or more cognates in the basic vocabulary list. That overall percentage characterizes a well justified family unit, showing a high level of divergence among the languages.

It is also clear from the result that Akuntsú and Mekens are closer to each other than any of the other languages, sharing a cognate rate of 79%. This confirms the classification advanced by Gabas Jr. (2005) that listed them as different but very similar languages, almost to the level of being dialects of the same language. Akuntsú shows the higher number of shared cognates with each pair of languages, including a rate of 71% with Wayoro, which is not too distant from the rate found between Akuntsú and Mekens.

On the other extreme, Makurap appears as the most distant, having 51% or less of shared cognate sets with the other four languages.

3. Phonological comparison and reconstruction

In this section, we present some highlights in the phonological reconstruction of Proto-Tupari. Because of limits of space, we will not go over the details of the reconstruction, which is the subject of another paper in progress. Our goal here is to present the results of our recent comparative study, showing the parallel between the current work and the previous reconstruction by Moore and Galucio (1994).

3.1. Reconstructed Proto-Tupari consonants

Following the principles of the comparative method (Jeffers and Lehiste, 1986; Fox, 1995, among others), we were able to reconstruct the Proto-Tupari consonants, shown in table 9. This chart has 18 reconstructed consonants, distributed in the same series of consonants found in the daughter languages. As shown in subsection 2.2, the five Tupari languages all have between 11 and 14 consonantal phonemes. The major difference between Proto-Tupari and the daughter languages is that Proto-Tupari has a full series of labiovelars and a complete series of voiced stops, whereas none of the daughter languages have both series completed in all points of articulation.

Table 9. Reconstructed consonants for Proto-Tupari

	Bilabial	Alveolar	Palatal	Velar	Labiovelar	Glottal
Plosive	p	t		k	k ^w	ʔ
	b	d ⁶		g	g ^w	
Nasal	m	n		ŋ	ŋ ^w	
Affricate		ts				
Fricative	β					h
Tap		r				
Approximant (glide)			j			

Compare the chart in table 9 to the one in table 10 from Moore and Galucio's (1994) first Proto-Tupari reconstruction, where they proposed 25 reconstructed consonants. In general, their reconstruction is confirmed when checked against our extended comparative database. The major difference between these two reconstructions is the absence of the series of pre-nasal stops in our proposal. Also, based on a larger comparative corpus, we confirmed the phonemic status of the bilabial voiced stop *b, but found no justification to maintain the voiced pre-nasal fricative *ndz.

Table 10. Proto-Tupari consonants proposed by Moore and Galucio (1994)⁷

	Bilabial	Alveolar	Palatal	Velar	Labiovelar	Glottal
Plosive	p	t		k	k ^w	ʔ
	(b)	D		g	g ^w	
Nasal	m	n	ɲ	ŋ	ŋ ^w	
Pre-nasal	mb	nd		ŋg	ŋg ^w	
Affricate		ts				
		(n)dz				
Fricative	β					h
Tap		r				
Approximant (glide)			j ǰ			

By postulating a complementary distribution involving the nasal and pre-nasal stops in Proto-Tupari, we eliminate the series of pre-nasal stops, since they are analyzed as allophones of the nasal phonemes before oral vowels. This complementary distribution

⁶ See section 3.2 for a discussion of this reconstructed phoneme.

⁷ The () indicates uncertainty about reconstructing the segment. Capital letters indicate indefiniteness about the phonetic form of a segment.

had also been noted by Moore and Galucio, but they opted for a more phonetically based reconstruction.

Table 11. Complementary distribution of Proto-Tupari nasal consonants

Bilabial	/m/	[m]/_V _{nas}	[mb]/_V _{or}	[m]/V _{nas} _#
Alveolar	/n/	[n]/_V _{nas}	[nd]/_V _{or}	[n]/V _{nas} _#
Velar	/ŋ/	[ŋ]/_V _{nas}	[ŋg]/_V _{or}	[ŋ]/V _{nas} _#
Labiovelar	/ŋ ^w /	[ŋ ^w]/_V _{nas}	[ŋg ^w]/_V _{or}	

This complementary distribution is illustrated by examples from the daughter languages, for the bilabial series.

Table 12. Examples of complementary distribution in the bilabial series

Proto-Tupari	Akuntsú	Wayoro	Makurap	Mekens	Tupari	
/*m/ [*m]	m	m	m	m	m	
*amēko	amēko	amēko	amēko	amēko	amēko	‘jaguar;dog’
/*m/ [*mb]	p	mb	mb	p	p	
*mo [mbo]	po	mbo	mbo	po	po [ϕo]	‘hand’

For the palatal consonants (*ɲ, *j, *ʝ) present in Moore and Galucio’s (1994) reconstruction, we reconstruct only one phoneme *j that has four allophones according to its context of occurrence.

*Table 13. Distribution of the Proto-Tupari palatal phoneme /*j/*

Palatal Glide	/*j/	[ɲ]/_V _{nas}	[j] ~[ndʒ]/_V _{or}	[ʝ]/V _{nas} _#	[j]/V _{or} _#
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3.2. On the reconstructed *d

One of the most interesting correspondence sets in the Tupari languages involves alveolar, alveopalatal and fricative consonants. This correspondence set – t:nd:tʃ:t:h;Ø – was reconstructed as *D by Moore and Galucio (1994), indicating that they were unsure about the phonetic form of this phoneme. In this section, we offer a few insights into that issue, and provide the arguments supporting our reconstruction of *d for this correspondence set, as shown in table 14.

Table 14. Reflexes of the segment reconstructed as *d

Proto-Tupari	Akuntsú	Wayoro	Makurap	Mekens	Tupari	
*d	t [t]; [d]	n [nd]	tʃ	t	h, Ø	
*deep	tep	ndep	tʃeep	tep	hep	‘leaf’
*dek	tek	ndek	tʃeget	tek	hek	‘house’
*det	tet	ndet	tʃet	tet	het	‘name’
*daat	---	ndat	tʃaat	----	haat	‘snake’ ⁸
*ēdii	eti	ēndii	etʃi	eti	ei	‘string bag’ ⁹

Before determining the reconstruction as *d, we evaluated a number of possibilities. Assuming that the reconstructed proto-segment that accounts for the correspondence set t:nd:tʃ:t:h; Ø should be an alveopalatal or alveolar consonant, we evaluated the possibility of it being an affricate, such as *ts, *ð or *tʃ. However, the former possibility is excluded since there is another correspondence set – tʃ:t:t:ts:t:s – that clearly reconstructs as the affricate *ts, which becomes [+palatal] in Akuntsú, and loses the feature [+sibilant] in Wayoro, Makurap and Tupari, except before [i] in Tupari, as shown in table 15.

Table 15. Reflexes of the segment reconstructed as *ts

Proto-Tupari	Akuntsú	Wayoro	Makurap	Mekens	Tupari	
*ts	tʃ	t	t	ts	t	
*-tso-	i-tʃo-p	to-a	to-a	i-tso-a	to-a	‘to see’
*atsi	atʃi	ati	---	atsi	pe-asi	‘pain’

The alternative to reconstruct the correspondence set t:nd:tʃ:t:h; Ø as *tʃ or *ð does not reflect the tendencies observed in the historical development of the daughter languages either. For instance, it goes against the well documented tendency in Akuntsú and Mekens to maintain the [+fricative] feature in their historical development from Proto-Tupari, as seen in table 15, since in both languages the reflexes of this correspondence set are voiceless stops.

⁸ Akuntsú and Mekens do not have cognate forms in this set.

⁹ This is a special type of crochet bag, made of tucum leaf fibers, known as *marico* in Portuguese, and very common in the Guaporé-Mamoré region, especially in the Brazilian side.

At the present stage of our analysis, we propose to reconstruct an alveolar voiced stop *d for the correspondence set *t:nd:tʃ:t:h; Ø*. The reasoning behind this choice is as follows: (i) Both in Akuntsú and Wayoro, the phonetic reflexes of this segment are still [d] and [nd], respectively. In Akuntsú, the phoneme /t/ has [d] as one of its allophones in free variation with [t], in certain environments (Aragon, 2008). In our Akuntsú corpus, we have one record of the word ‘hair’ pronounced with the voiced stop [d]: [odap] ‘my hair’. In Wayoro, the prenasalized phone [nd] is currently analyzed as an allophone of /n/ before oral vowels (Nogueira, 2011), but that could be explained as a later merger between reflexes of the two proto-segments *d and *n. (ii) There is a well attested devoicing process in other correspondence sets in Akuntsú and Mekens, that explains the voiceless reflex [t] in these two languages, and its phonological form /t/. (iii) Different sounds developed into [tʃ] in Makurap, including one of the allophones of *j, which corresponds to [tʃ] in Makurap and [ndʒ] in Wayoro, for instance. Thus, we can assume a process of merger between the reflexes of *d and *j in Makurap, both changing into [tʃ]. (iv) For Tupari, we assume weakening of *d, probably through an intermediary stage that involves a fricative, such as an interdental [ð], and culminates with loss of the segment in intervocalic position, as in *d > ð > ? > h > Ø.¹⁰ The deletion of intervocalic [h] in Tupari is well attested in other correspondences. The reflex of *d merges with the reflex of *h in Tupari. An intermediary stage with a glotal stop in Tupari is necessary to account for the correspondence set found in the form for third person pronoun: *te:ndeke:tʃe:te:ʔe*. (v) A final observation is that reconstructing a *d for this correspondence makes the system of voiced stops in Proto-Tupari symmetrical, since *d was the only gap in the series, as seen in table 10 above.

In addition, it should be noted that most of the words showing the correspondence set *t: nd: tʃ: t: h; Ø* have two alternating forms, when we compare their possessed and unpossessed forms. The former shows the consonant initial that participates in the correspondence set, while the latter has no consonant initial. This is illustrated in table 16 with the word for ‘house’ in the Tupari languages, which is given in a paradigm including unpossessed, NP possessed, and pronominal possessed forms. Note that the unpossessed form is *ek* in all five languages, whereas the consonant initial form occurs when there is a possessor.

In Akuntsú, Wayoro, Makurap, and Mekens, the form is the same whenever there is a possessor, be it a NP or a pronominal prefix. They all have the consonant initial. However, in Tupari, there is a difference in the possessed forms. Tupari has the consonant initial *h* in NP possessed forms, but a *Ø* reflex in pronominal possessed forms. Comparing the Tupari language paradigm, shown in table 16, to the form for ‘marico’ (table 14), we can postulate a change from *h > Ø* in intervocalic environments.

¹⁰ This intermediary stage involving an interdental fricative in Tupari is justified by the synchronic occurrence of other fricatives in the language. For instance, there are two fricatives that occur as allophones of /p/: [ɸ] and [ps] before [o] and [i], respectively.

Table 16. Possessed and unpossessed forms of the word 'house'

	Akuntsú	Wayoro	Makurap	Mekens	Tupari
Unposs.	ek	ek	ek	ek	ek
NP	Tʃaroj t-ek	Paulina ndek	awa tʃ-eg-et	otop tek	Konkoat h-ek
1S	o-t-ek	o-ndek	o-tʃ-eg-et	o-tek	o-ek
3S	i-t-ek	ndeke ndek	---	i-t-ek	i-ek

The consonant shown in the possessed forms are analyzed in Akuntsú, Makurap, and Tupari as an independent morpheme identified as 'contiguity relational prefix', which indicates that the determiner of a given word comes immediately before it (Aragon, 2008; Braga, 2005; Alves, 2004). Although the correspondence set *t: nd: tʃ: t: h; Ø* is still unclear, the data in table 16 suggest that the proto-segment originating that correspondence was sensitive to the environment in which a possessor or determiner was present.

More research is still needed for a complete understanding of this correspondence set – *t:nd:tʃ:t:h; Ø*. Solving this question will be useful not only for a full reconstruction of Proto-Tupari, but also for the reconstruction of the corresponding segment in Proto-Tupi, since similar correspondence sets are found in all the 10 branches of the family. Reconstructions at the branch level of the proto-segments responsible for the correspondence sets are becoming available.

3.3. Reconstructed Proto-Tupari vowels

Moore and Galucio (1994) reconstructed the vowels shown in table 17. With our extended comparative corpus, we confirmed the vocalic segments they proposed, and, in addition, we reconstructed a full series of oral long vowels, and three long nasal ones (cf. table 18). The reconstructed data presented in Moore and Galucio (1994) already indicated that Proto-Tupari had long vowels, but the information had not been systematized in a chart of reconstructed vowels due to insufficient data.

Table 17. Proto-Tupari vowel chart from Moore and Galucio (1994)

Nasal			Oral		
ĩ	ĩ	õ (ũ)	i	ĩ	o (u)
ẽ	ã		e	a	

Table 18. Reconstructed Proto-Tupari vowel chart

Short oral	Long oral	Short nasal	Long nasal
i ĩ o (u)	i: ĩ: o: (u:)	ĩ ñ õ (ũ)	ĩ: ẽ: ã:
e a	e: a:	ẽ ã	ẽ: ã:

Based on the symmetry between the short and long oral vowels, we predict that the series of long nasal vowels should be symmetric with the short nasal vowels as well, however our current list of cognate sets only supports the reconstruction of the three long nasal vowels as given in table 18.

4. Morphological comparison and reconstruction

In this section, we present the first results of the morphological comparative analysis of the five Tupari languages. We analyzed some morphosyntactic aspects of the daughter languages, including the personal pronominal system, the morphosyntactic alignment system, and a subset of derivational morphemes (causative, verbalizer and nominalizer), and give the reconstructed proto-morphemes.

4.1. Morphological reconstruction: person pronominal system

All five Tupari languages have two series of personal pronominal markers: a series of bound or clitic morphemes and a series of free pronouns.¹¹ These two series are reconstructed for Proto-Tupari, as shown in tables 19 and 20. The Proto-Tupari system makes a singular versus plural distinction, but no gender distinction. In addition, there is inclusive/exclusive distinction in the first person plural.

The reconstruction of the singular forms is very straightforward. First and second person singular, *o- and *e-, do not require further explanation. The second syllable of the third person singular pronoun was lost in Akuntsú, Mekens and Tupari. The comparable third form in Mekens is *te*. However, the correferential form *sete* is now replacing it.

¹¹ The personal bound morphemes are analyzed as clitics in Makurap, and as prefixes in the other languages.

Table 19. Proto-Tupari personal pronouns

	Akuntsú	Wayoro	Makurap	Mekens	Tupari	Proto-Tupari
1S	on ~ one	õn	on	õt [õn]	on	*õn
2S	en ~ ene	ẽn	en	ět [ẽn]	en	*ẽn
3S	te	ndeke	tʃeke	te; sete	ʔe	*deke
1PIN	kitʃe	tʃire	kitẽ-jã	kitse	okit-wat; ¹²	*okitse-jat
1PEX	otʃe	ote	tẽ + jã	otse	ote	*otse-jat
2P	jat	ɲdʒat	ekitẽ-jã	e-jat	wat	*e (kitse)-jat
3P	ke + jat	ndeat	tʃeke-jã	te-jat	ʔe	*deke-jat

In the plural paradigm, we reconstruct a complex form composed of the pronoun plus the plural morpheme **-jat*.¹³ By analogy, we reconstruct the plural morpheme for all the persons, even in the cases where only one language shows the plural morpheme synchronically.

The first plural exclusive pronoun, **otse-jat*, combines the pronoun plus the plural morpheme. The pronoun form is composed of the first person singular prefix **o-* plus a derivation of the third person prefix, **tse-*, which shows a regular development of the well-attested correspondence tʃ:t:t:ts:t reconstructed as **ts*.

For third person plural, we reconstruct the form for third person singular **deke* plus the plural morpheme. In the historical development of the daughter languages, the first syllable is lost in Akuntsú, and the second syllable in Wayoro, Mekens, and Tupari. The form in Makurap provides the essential clue for the reconstruction. The other plural pronouns are discussed together with the bound morphemes below.

The bound morphemes are clearly related to the pronouns, though the correspondences in the daughter languages are not as direct as those in the pronoun forms. First and second person singular and first person plural inclusive are reduced forms of the corresponding pronouns. For first person plural exclusive, all five languages have a bound form that is homophonous with the pronoun. The third person forms are subdivided into object and subject markers.¹⁴ The object marker series can be used for singular or plural reference.

¹² Tupari has a distinct form for first person dual inclusive, without the plural morpheme: *kit*; *okit*. The occurrence of these two forms of 1st person inclusive (dual and plural) can be analyzed as a (morphological) split that took place only in Tupari. In addition, Tupari shows a distinction between the forms *kit* and *kit+wat* versus *okit* and *okit+wat*, the former are used in future and the latter in non-future situations (Alves, 2004).

¹³ The plural morpheme has similar forms in all five languages jat:ɲdʒat:jã:jat:wat, but we cannot explain the forms in Makurap and Tupari, since they are not directly derived from the known correspondences.

¹⁴ The subject marker forms are also used for reflexive third person object.

Table 20. Proto-Tupari bound personal morphemes

	Akuntsú	Wayoro	Makurap	Mekens	Tupari	Proto-Tupari
1S	o-	m- ~ o-	o	o-	o-	*o-
2S	e-	e-	e	e-	e-	*e-
3S (O)	i- ~ t-	j- ~ ɲ- ndeke-	j- ~ Ø	i- ~ s-	i- ~ s-	*i-; *ts
3S (S)	t-	te-	e	se-	te-	*tse
1PIN	ki-	tʃi-	ki	ki-	ki-	*ki-
1PEX	otʃe-	ote-	te	ose-	ote-	*otse-
2P	jat-	ɲdʒat-	eki	e-jat-	wat	*e(ki)-
3P	i- ~ t-	j- ~ ɲ- ndeat-	Ø; e	i-; (se)te-jat-	i- ~ s-	*i-; *ts *de(ke)-jat

4.1.1 Borrowing from a neighbor language

The Wayoro form for first person plural inclusive (pronoun and prefix) is explained through borrowing from the neighbor language Arikapú (Macro-Jê).¹⁵ Though the forms in Wayoro – *tʃire* and *tʃi-* – are still phonetically similar to the forms in the other Tupari languages, they are not cognates. Moreover, despite the fact that a sound change of *ki* > *tʃi* has been attested in different language families, e.g., Slavic, Indo-Iranian, and Bantu (Chang *et al.*, 2001), there are no systematic correspondences involving *tʃ* in Wayoro and *k* in the other languages or *r* in Wayoro and *t:ts:tʃ:t* in the other languages. There is no internal variation in Wayoro, involving *tʃ* and *k*, either.

On the other hand, there is close similarity between the forms in Wayoro and in Arikapú. Similar to the Tupari languages, Arikapú also has two series of personal morphemes (prefixes and free pronouns), but there is no inclusive/exclusive distinction. The forms for first person plural inclusive in Arikapú are *tʃihε* and *tʃi-* (van der Voort, 2007). The full series of personal first plural morphemes in Arikapú are given in table 21.

¹⁵ Arikapú (Macro-Jê) is one of the languages spoken in the same indigenous territory, the *Terra Indígena Rio Guaporé*, where the remaining Wayoro speakers still live. The two languages have been in close contact for at least a century. Arikapú is now very endangered; there is only one last speaker of the language.

Table 21. First plural inclusive morphemes in Arikapú (van der Voort, 2007)

	Pronouns	Possessive	Intransitive	Transitive	
				Subject	Object
1S	ihe	i-	i-	ihe	i-
2	ahe	a-	a-	ahe	a-
1P	tʃihe	tʃi-	tʃi-		tʃi-

Comparing the Arikapú forms (table 21) to the Wayoro forms (table 22), we could explain the Wayoro first person plural inclusive forms through lexical borrowing from Arikapú. This borrowing is restricted to 1st plural inclusive, the other Wayoro forms follow the historical development from Proto-Tupari. Despite the close contact between the groups, the specific sociolinguistic contact relation that motivated this change is as yet unknown.

Table 22. First person plural morphemes in the Tupari branch.

	Wayoro	Akuntsú	Makurap	Mekens	Tupari	Proto- Tupari
Pronouns	tʃire	kitʃe	kitẽ-jã	kitse	kit-wat	*kitse-PL
Prefixes	tʃi-	ki-	ki	ki-	ki-	*ki-

4.1.2 Morphological shift and regrammaticalization in the 2nd person plural¹⁶

The form for second person plural in both series (pronouns and prefixes) is reconstructed as **e(kitse)-jat* and **e(ki)+-jat*, respectively (cf. table 23). The Makurap pronoun contains the 2nd person singular prefix plus 1st person plural inclusive plus the plural morpheme, *e-kitẽ-jã*. We cannot explain that composition, and choose to keep it in parentheses in the reconstructed form, pending further analysis. The Makurap bound form loses the last syllable of the pronoun and the plural morpheme. The Mekens forms for pronoun and prefix are identical, and combine the 2nd person singular prefix plus the plural morpheme, *e-jat*.

Table 23. 2nd person morphemes in Tupari

	Makurap	Mekens	Akuntsú	Tupari	Wayoro	Proto- Tupari
Pronouns	ekitẽ-jã	e-jat	jat	wat	ɲdʒat	*e (kitse)-jat
Prefixes	eki	e-jat-	jat-	wat ¹⁷	ɲdʒat-	*e(ki)-jat

The forms in the other three languages are explained through a process of morpheme loss, morphological shift and regrammaticalization involving the plural (or

¹⁶ The notions of regrammaticalization and morphological shift are used here in the sense defined by Jeffers and Lehiste (1986) for the former, and Fox (1995) for the latter.

¹⁷ Alves (2004) analyzes the Tupari 2nd person plural as having only the pronoun form.

collective) morpheme. Starting with the proto-form **e-jat* (ignoring the Makurap idiosyncrasy), after the loss of the referential morpheme *e-*, a shift in the grammatical function of the plural morpheme led to its regrammaticalization as second person plural pronoun, replacing the old form, in Akuntsú, Wayoro, and Tupari.

We could not find references to *jat-* and *wat* as plural morphemes independent from the pronominal paradigm, for Akuntsú and Tupari. However, the corresponding morphemes in Mekens and Wayoro are well documented as plural/collective morphemes independently, as shown in examples (1) and (2).

Mekens

- | | | |
|--------|-----------|---|
| (1) a. | ameko | ‘jaguar; dog’ ¹⁸ |
| b. | ameko-jat | ‘many jaguars; dogs’/ ‘a group of jaguars;dogs’ |
| c. | omēt | ‘my husband’ |
| d. | omēr-iat | ‘my husband’s clan’/ ‘my husband’s family’ |

Wayoro

- | | | |
|--------|-----------|----------------|
| (2) a. | mberɪ | ‘monkey’ |
| b. | mberɪ-jat | ‘monkeys’ |
| c. | epi:p | ‘banana’ |
| d. | epi:β-iat | ‘banana trees’ |

The occurrence of *-jat* as plural (collective) morpheme in Mekens and Wayoro, and the combination of the correspondent morpheme with the pronoun in other persons in the pronominal paradigm leads to the conclusion that a similar distribution obtained in Akuntsú, Wayoro and Tupari: the plural forms were formed of the pronoun+plural morpheme. In the historical development of these three languages, the plural morpheme was lost in some persons of the paradigm and regrammaticalized as 2nd person. The 2nd person prefix is illustrated in examples (3) for four of the Tupari languages.

- | | | |
|--------|------------------|-----------|
| (3) a. | jat-Ø-ororo-pe | (Akuntsú) |
| | 2P-R-cotton-bark | |
| | ‘Your clothes’ | |
| b. | ɲdʒat-ndet | (Wayoro) |
| | 2P-name | |
| | ‘Your names’ | |

¹⁸ The abbreviations used in this work are: CAUS=causative, DET=determiner, GEN=genitive, IMPERF=imperfective, INSTR=instrumental, NOM=nominalizer, N=noun, PL=plural, POSP=postposition, PST=past, R=relational prefix, TH.V=theme vowel, TR=transitivizer, TRSLT=translative, V=verb, VRBLZR=verbalizer, 1S=first person singular, 1P=first person plural, 1PEX=first person plural exclusive, 1PIN=first person plural inclusive, 2S=second person singular, 2P=second person plural, 3C= coreferential third person, 3S=third person singular, 3P=third person plural, +=clitic boundary.

- c. ejat-tek (Mekens)
 2P-house
 ‘Your house’
- d. wat h-ek (Tupari)
 2P R-house
 ‘Your house’

4.2 Morphological reconstruction: alignment system

All five Tupari languages employ a similar morphosyntactic alignment system that can be characterized as ergative-absolutive alignment. The system is organized following a complementary distribution of the personal pronouns and prefixes. As shown in table 24, the pronouns mark the ergative argument (A), while the prefixes mark the absolutive (S and O). The occurrence of this system in all five daughter languages led us to reconstruct the same pattern of morphosyntactic alignment system for Proto-Tupari.

Table 24. Proto-Tupari: ergative-absolutive alignment

	Pronouns	Prefixes
Transitive subject (A)	X	
Intransitive Subject (S) Transitive object (O)		X

Illustration of the synchronic realization of this ergative-absolutive pattern in the distribution of the personal pronominal morphemes is provided in examples (4) and (5), for Makurap, Mekens, and Tupari.

4.2.1 S-Argument¹⁹

- (4) a. o + apitet-a (on) (Makurap)
 1S+think-TH.V I
 ‘I think.’
- b. o-er-a-t (õt) (Mekens)
 1S-sleep-TH.V-PST I
 ‘I slept.’
- c. o-kar-a on (Tupari)
 1S-fall-TH.V I
 ‘I fell down.’

¹⁹ The indication of the pronoun in parentheses indicates optionality.

4.2.2 A and O-Arguments

- (5) a. tʃeke o + peat-a (Makurap)
 he 1S+look.for-TH.V
 ‘He looks for me.’
- b. o-so-a-t ãt (Mekens)
 1S-see-TH.V-PST you
 ‘You saw me.’
- c. o-to-a en (Tupari)
 1S-see-TH.V you
 ‘You saw me.’

4.3 Morphological reconstruction: derivational morphemes

The first results of the morphosyntactic comparative analysis show that the derivational morphemes are very stable throughout the historical development from Proto-Tupari to the daughter languages. We will present here only the reconstruction of the causative, verbalizer and nominalizer morphemes. All three of these morphemes have cognate forms and comparable morphosyntactic properties in the five languages.

4.3.1 Reconstruction of causative morpheme

All five Tupari languages have a causative morpheme that adds an argument to an intransitive verb, changing it into a transitive verb. The added argument functions as the object of the clause. In Mekens and Wayoro this causative morpheme has been analyzed as a transitivizer (Nogueira and Galucio, in press), that also carries the semantics of causation. In Wayoro, Mekens, and Tupari there is an allomorphy defined by the initial segment of the verb root: *mõ-*; *m-* occur with vowel initial roots, whereas *õ-* occurs with consonant initial roots. The systematic correspondence of form and function among all five languages and the occurrence of the same allomorphy in three languages justify the reconstruction of the causative morpheme and the same phonologically conditioned allomorphy in Proto-Tupari, as shown in table 25.

Table 25. Causative morpheme in Proto-Tupari

	Akuntsú	Wayoro	Makurap	Mekens	Tupari	Proto-Tupari
Causative	mo-	mõ-/õ-	mõ-	mõ-/õ	m-/õ-	*mõ-/õ-

The synchronic use and distribution of the causative morpheme is illustrated for Akuntsú, Makurap, Mekens, and Tupari in examples (6) to (9) below.

- (6) a. t-akar-a (Akuntsú)
 3S-fall-TH.V
 ‘(he) fell down.’

Table 27. Nominalizer morpheme in Proto-Tupari

	Akuntsú	Wayoro	Makurap	Mekens	Tupari	Proto-Tupari
Nominalizer	-ap	-p	-ap	-ap	-ap	*-ap

- (11) a. atʃo-ap (Akuntsú)
wash-NOM
‘soap’
- b. ŋgwajkip iβoj-tʃkwa-p nō-ø-ã-n (Wayoro)
man fish(N)-fish(V)-NOM give-VRBLZR-TH.V-PST
te-ndaip mē
3-son POSP
‘The man gave a fishing net to his son.’
- c. er-ap (Makurap)
sleep-NOM
‘The event of sleeping; the place where one sleeps.’
- d. mi-ap (Mekens)
kill;shoot-NOM
‘arrow; gun’
- e. arop-k-ap (Tupari)
food-ingest-INSTR
‘spoon’

5. Internal classification

In an attempt to advance a proposal for the internal classification of the Tupari branch, we analyzed the phonological and morphological processes of linguistic change proposed for the historical development of the daughter languages. The shared innovations were used as indications of subbranchings. It is interesting to compare the results in table 28.

Table 28. Shared innovations in the historical development of the Tupari languages

Shared phonological innovations	
1.	Akuntsú & Mekens & Tupari: *m > p; *n > t; *ŋ > k before oral vowels
2.	Mekens & Tupari: *t > ts/s next to [e; i]
3.	Makurap & Tupari: *k ^w > β/w; *g ^w > β/w; ŋ ^w > β/w
4.	Makurap & Tupari & Wayoro: *ts > t
Shared Morphological innovation	
5.	Akuntsú & Tupari & Wayoro: Morphological shift – Plural morpheme > 2nd person pronoun
6.	Akuntsú & Mekens & Tupari & Wayoro: regrammaticalization – Causative verb > transitiver suffix

Considering both groups of innovations, Tupari appears to be the language that changed the most from Proto-Tupari, since it participates in all six identified shared innovations. Apparently, Tupari shares two or more changes with all the other languages, but in different subgroupings. Tupari and Mekens share changes (1, 2, 6), Tupari and Akuntsú share changes (1, 5, 6), Tupari and Wayoro share changes (4, 5, 6), and Tupari and Makurap share changes (3, 4).

No clear subgrouping appears on the basis of sound changes, which is not surprising since they are unmarked processes (except *ts > t) that could be the results of independent evolution. The sound changes also do not correlate neatly with the lexicostatistical subgrouping.

However, the shared morphological innovations are consistent with the lexicostatistical internal classification, which separates Makurap off from the other languages at an early date.

We expect to find more evidence for the internal classification as comparison and reconstruction progress.

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