

Research Article

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Reconstruction of Ryukyuan tone classes of Middle Japanese Class 2.4 and 2.5 nouns

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Abstract: It is generally accepted that of the five tone classes reconstructed for disyllabic nouns in Middle Japanese (MJ), Classes 2.4 and 2.5 exhibit a split correspondence with proto-Ryukyuan (pR) tone Classes B and C. This split correspondence is of tremendous importance for the reconstruction of the proto-Japonic (pJ) tone system, because, in the absence of a conditioning factor accounting for the split, it has led to the reconstruction of additional tone classes at the pJ level. However, of the approximately 100 nouns belonging to these classes, the tone class of only half of them has been reconstructed for pR. Before embarking on the reconstruction of the pJ tone system, we must therefore first reconstruct the pR tone class of the nouns belonging to MJ Classes 2.4 and 2.5. This study provides a reconstruction of the tone classes in pR for 75 cognates using the latest comparative data of Northern and Southern Ryukyuan dialects. The results confirmed the existence of a split correspondence, where Class 2.4 and 2.5 nouns are found to be roughly split in half between pR Classes B and C, demonstrating that it is not a merely sporadic irregularity.

Keywords: Ryukyuan, Japanese, proto-Japonic, tone system, reconstruction, Class 2.4, Class 2.5, conditioned merger hypothesis

1 Introduction

According to the currently widely accepted phylogenetic classification (Pellard 2015), the Japonic language family consists of three branches, namely, Ryukyuan, Japanese, and Hachijo, although the phylogenetic position of Hachijo is debatable. The Ryukyuan languages are spoken in the Ryukyu Islands and consist of five mutually unintelligible languages. They are classified into two subbranches, Northern and Southern Ryukyuan. The former comprises the Amami and Okinawa languages, whereas the latter the Miyako, Yaeyama, and Yonaguni languages (Pellard 2015). The common ancestor of Ryukyuan, Japanese, and Hachijo is called proto-Japonic (pJ), whereas that of the Ryukyuan languages is referred to as proto-Ryukyuan (pR). The terms Old Japanese (OJ) and Middle Japanese (MJ) refer to the dialect spoken around the ancient capital (Nara and Kyoto) in the eighth and eleventh centuries, respectively. The eighth-century written records of Japanese include dialects from around the ancient capital (West Old Japanese) and Eastern Japan (East Old Japanese), but this study does not discuss East Old Japanese, and the term OJ refers only to West Old Japanese.

Although the phonograms in the OJ text *Nihon Shoki* have been argued to partly reflect the tonal OJ contrasts (e.g., Takayama 2003), MJ is the oldest stage of Japanese for which we have both extensive and accurate materials on tonal contrasts. Based on these extensive materials, along with a comparison of modern Japanese dialects, the standard theory (Kindaichi 1974) reconstructs five tone classes for disyllabic nouns in MJ, commonly labeled Classes 2.1, 2.2, 2.3, 2.4, and 2.5. Conversely, the comparison of Ryukyuan

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dialects has led to the reconstruction of three tone classes in pR, namely, Classes A, B, and C (Hattori 1958, Matsumori 2012).

The correspondences between the tone classes of MJ and pR are not, however, all straightforward. Although some studies (Kindaichi 1960, Hirayama et al. 1966, 1967, Uemura, 1977) state that MJ Classes 2.1 and 2.2 correspond to pR Class A, MJ Class 2.3 to pR Class B, and MJ Class 2.4–2.5 to pR Class C, to date, not a single Ryukyuan dialect has been found where this holds true. As first discovered by Hattori (1958), and repeatedly confirmed by subsequent studies (Hattori 1979a,b, Matsumori 1998, 2000a,b, 2009, 2010, 2012, Shimabukuro 2007, de Boer 2010), MJ Classes 2.4 and 2.5 (Class 2.4–2.5, henceforth) exhibit a split correspondence with pR Classes B and C. In other words, although MJ Classes 2.1 and 2.2 regularly correspond to pR Class A, and MJ Class 2.3 to pR Class B,¹ MJ Class 2.4–2.5 nouns are split roughly in half between pR Classes B and C (Table 1).² The split correspondence in MJ Class 2.4–2.5 has led researchers to define additional subclasses for disyllabic nouns (Hattori 1979a,b); namely, Classes 2.4a and 2.5a (Class 2.4a/2.5a, henceforth), whose pR reflex is Class C, and Classes 2.4b and 2.5b (Class 2.4b/2.5b, henceforth), whose pR reflex is Class B.

Some researchers have advanced the hypothesis that the split correspondence is the result of a conditioned sound change that occurred in pR, whereby Class 2.4a/2.5a nouns merged into Class 2.3 (Kindaichi 1960, Hirayama et al. 1966, Tokugawa 1990). This conditioned merger hypothesis is, however, not widely accepted today, because it suffers from too many exceptions (Uwano 1996a, de Boer 2010). In the absence of a clear conditioning factor, most researchers interpret the distinction between Class 2.4a/2.5a and Class 2.4b/2.5b in pR as an archaic feature inherited from pJ (e.g., Hattori 1979a,b, Vovin 1993, 2008). Thus, there has been an intense debate as to what tonal contrasts should be reconstructed for pR and pJ (Shimabukuro 2008, Vovin 2008, Pellard 2009b, Uwano 2017b).

However, the exact membership of the subclasses has not been fully elucidated. Indeed, although approximately 100 nouns have already been identified as belonging to Class 2.4–2.5 (Kindaichi 1974), for only half of them has the tone class of pR been reconstructed so far (Hattori 1979a,b, Matsumori 2000b, 2009, 2012, Shimabukuro 2007, de Boer 2010). A further problem with previous research (Hattori 1979a,b, Matsumori 2009, 2012) is that the reconstructions were primarily based on data from Northern Ryukyuan, whereas Southern Ryukyuan played little role. Before we can begin to have a fruitful conversation about the pJ tone system, the exact makeup of the subclasses must first be firmly established. The enlargement of the inventory of Class 2.4–2.5 nouns in pR would either strengthen the widely accepted hypothesis that regards the subclasses as archaisms inherited from pJ or revive the unorthodox hypothesis that views them as an innovation in pR.

This study thus aims to determine the membership of Classes 2.4a/2.5a and 2.5a/2.5b based on the latest data available for Northern and Southern Ryukyuan. Section 2 lays out the background. Sections 3 and 4 describe the methods and results of our survey, respectively. Summarizing the results, Section 4 reveals

¹ Hattori (1958, 1979a,b) also finds a split correspondence for MJ Class 2.3 nouns. However, the number of Class 2.3 nouns belonging to Class C is extremely small. Specifically, of the 36 nouns analyzed by Hattori (1979a,b), only five (MJ *kame* ‘jar’, *mari* ‘ball’, *nomi* ‘flea’, *fama* ‘beach’, and *fone* ‘bone’) belong to Class C, with the rest belonging to Class B. Of Hattori’s (1979a,b) 36 nouns, MJ *wono* ‘axe’ and *fone* ‘bone’ are not considered to be Class 2.3 in Kindaichi’s (1974) list; therefore, the proportion of Class C is only 4 out of 34. Importantly, extending the analysis to all Class 2.3 nouns does not increase the number of Class C nouns. According to Igarashi (2016c), more than 80 Class 2.3 nouns are safely reconstructed for pR, but no Class C nouns are found other than those listed by Hattori (1979a,b). Thus, Class 2.3 nouns belonging to Class C merely account for approximately 5% of the total number of Class 2.3 nouns in pR. This allows us to consider that the split correspondence in Class 2.3 nouns is sporadic, although we also admit that the nature of the split in Class 2.3 nouns needs to be thoroughly examined in the future.

² Similarly, Matsumori (2000a) argues that the split correspondences are also observed for tri-syllabic nouns, specifically, for Classes 3.4 and 3.5. However, most of the Class 3.4 nouns are in fact reflected as Class B; among the approximately 40 Ryukyuan cognates of Class 3.4 nouns, only six correspond to pR Class C (Igarashi 2018). The split in Class 3.4 can be seen as merely sporadic irregularity; if not, they must be different in nature from Class 2.4–2.5 nouns, which are roughly split in half between Classes B and C. As for Class 3.5, irregular correspondences are also observed even among Japanese dialects (Matsumori 1995, 1997), and there is some debate as to whether Class 3.5 can be traced back to pJ single Class (Uwano 1996b). The split correspondences in Classes 3.4 and 3.5 should be explained by different principles from that for Class 2.4–2.5; they will not be discussed further in this study.

Table 1: Tonal correspondences between Japanese dialects (Kyoto and Oita [Hirayama et al. (1992–1993)]) and Ryukyuan dialects (Yoron [Kiku and Takahashi 2005] and Nakijin [Nakasone 1983]). Nouns in the Oita dialect are accompanied by the case particle -ga because in this dialect, part of the tonal distinction is neutralized unless another morpheme follows the noun

MJ classes	pR classes	Subclasses	Kyoto	Oita	Yoron	Nakijin	
2.1	A		“nose” “water”	háná mízú	haná-gá midú-gá	pana	p ^h anáá
2.2	A		“sound” “snow”	óto júki	otó-gá jukí-gá	utu	put'úú
2.3	B		“mountain” “year”	jáma tóci	jamá-ga tocí-ga	jamá	jamaá
2.4	C	2.4a	“middle” “breath”	naká ikí	náka-ga íki-ga	náá	náhaa
	B	2.4b	“shoulder” “barley”	katá mugí	káta-ga múgi-ga	hatá	hat'aá
2.5	C	2.5a	“pot” “monkey”	nabé sarú	nábe-ga sáru-ga	nábí	nábi
	B	2.5b	“rain” “sweat”	amê asê	áme-ga áse-ga	amí	amií
						ací	acíí

that the split correspondence is genuine, and it reexamines the hypothesis that views it as a result of a conditioned merger. Section 5 concludes this study.

2 Background

The split correspondence in Class 2.4–2.5 was first discovered by Hattori (1958). To confirm his findings, Hattori (1979a,b) examined 10 dialects of Northern Ryukyuan and reconstructed the pR tone classes of 37 Class 2.4–2.5 nouns³ (Table 2). Based on data from several dialects of Northern Ryukyuan, Matsumori (1998, 2000a) revealed that the split correspondence was consistently observed in several dialects, confirming that it was genuine, and not merely a sporadic irregularity. In addition, Matsumori (2000b, 2009, 2012) proposed a vocabulary list called *keiretsubestu goi*, in which pR tone classes of more than 400 nouns are reconstructed. Of these nouns, 35 (Matsumori 2009) and 27 (Matsumori 2012) nouns belong to Class 2.4–2.5 (Table 2).⁴

Unlike the studies mentioned above, which are mainly based on Northern Ryukyuan, Shimabukuro (2007) included data from both Northern and Southern Ryukyuan in his comparison, but he only analyzed 13 MJ Class 2.4–2.5 nouns (Table 2), which were a subset of Hattori's (1979a,b) 37 nouns. de Boer (2010) also compared both Northern and Southern Ryukyuan, but her vocabulary considerably overlaps with Hattori's (1979a,b); she removed two words from Hattori (1979a,b) and newly added seven. Thus, the total number of MJ Class 2.4–2.5 nouns in de Boer (2010) was 42 (Table 2).⁵

³ Although Hattori (1979a,b) classified 39 nouns into MJ Class 2.4–2.5, it is controversial whether two of them, namely, MJ *oku* ‘interior’ and *moto* ‘origin’, belong there. According to Kindaichi (1974, 64), the tone classes of *oku* ‘interior’ and *moto* ‘origin’ are ‘difficult to define.’ According to Martin (1987), ‘origin’ belongs to Class 2.3 and ‘interior’ also possibly belongs to the same class. We therefore do not regard the two nouns as belonging to Class 2.4–2.5. Hattori (1979a,b) classified pR **joru* ‘night’ into Class 2.5, whereas, according to Kindaichi (1974), it belongs to either Class 2.4 or 2.5. We refer to its tone class as Class 2.4–2.5.

⁴ We count the number of nouns based on the idea that views pR **kinu* ‘garment,’ **pabu* ‘snake,’ **sora* ‘treetop,’ and **mado* ‘spare time’ as related to MJ *kinu* 2.4 ‘silk,’ *femi* 2.4 ‘snake,’ *sora* 2.4 ‘sky,’ and *mado* 2.5 ‘window,’ respectively. Other researchers may not agree with this idea. The cognacy between pR **pabu* and MJ *femi* is found to be doubtful in Section 4.3.

⁵ Following Hattori (1979a,b), de Boer (2010) regards MJ *oku* ‘interior’ as belonging to Class 2.4. Therefore, the total number of nouns is in fact 43.

Table 2: Dialects and the number of Class 2.4–2.5 nouns analyzed in previous studies

	Branches	Languages	Dialects (source)	No. Class 2.4–2.5 nouns
Hattori (1979a,b)	Northern	Amami	Onotsu, Aden, Naze, Shodōn, Asama (Uwano 1977)	37
Matsumori (2009)	Northern	Okinawa	Nakijin, Kushi, Onna, Shuri (OK) 1963	35
Matsumori (2012)	Northern	Okinawa	Kin	27
		Amami	Akaren, China	
Shimabukuro (2007)	Northern	Okinawa	Kin	
		Amami	Naze (Hirayama et al. 1966, 1967), Kamishiro (ASB 1959), Kametsu (Hattori 1979a,b)	
		Okinawa	Nakijin (Nakasone 1983), Shuri (OK) 1963, Aguni (Hirayama et al. 1966)	
		Miyako	Ikema (Hirayama et al. 1967), Oura (Hirayama et al. 1967), Uechi (Hirayama et al. 1967)	
		Yaeyama	Ishigaki (Hirayama et al. 1967), Sonai (Hirayama et al. 1967), Kuroshima (Hirayama et al. 1967)	
		Yonaguni	Yonaguni (Hirayama et al. 1967)	
		Amami	Aden (Hattori 1979a,b), Ashikebu (Uwano 1996a), Naze (Hattori 1979a,b), Asama (Uwano 1977 as cited in Hattori 1979a,b), Tokuwase (Matsumori 1998), Wadomari (Kuno 1991)	42
de Boer (2010)	Northern	Okinawa	Nakijin (Hattori 1979a,b), Onna (Hattori 1979a,b), Shuri (Hattori 1979a,b)	
		Miyako	Ikema–Sarahama (Matsumori 1998)	
		Yaeyama	Hateruma (Hirayama 1988)	
		Yonaguni	Yonaguni (Hirayama 1988, Martin 1987)	

The vocabulary investigated by previous studies is limited. Although Kindaichi (1974) lists 108 nouns as belonging to Class 2.4–2.5, the pR tone classes of only 55 of them (measured by type frequency) have hitherto been analyzed. This does not mean that the rest of Class 2.4–2.5 nouns do not exist in pR. On the contrary, as Section 4.4 reveals, at least 93 Class 2.4–2.5 nouns are considered to have existed in pR. This study thus attempts to establish the pR tone classes of those nouns that have not been reconstructed in previous studies so as to enlarge the inventory of Class 2.4–2.5 nouns in pR.

It is also clear from the discussion above that the previous literature has been based primarily on Northern Ryukyuan. In some respect, it was inevitable that Southern Ryukyuan was neglected. First, except for the Yonaguni dialect (Hirayama and Nakamoto 1964), dialects of Southern Ryukyuan distinguishing the three pR tone classes were not discovered until Matsumori's (2010) study of the Tarama dialect. Second, although many Southern Ryukyuan dialects retaining the three-way tonal contrast of pR were discovered one after another in the 2010s (Igarashi et al. 2011, Igarashi et al., 2012, Matsumori 2012, 2013, 2015), at the same time, the prosodic systems of these dialects turned out to be extremely complex. Indeed, because of extensive tonal neutralization processes at work in these dialects, the observation of words pronounced in isolation, or even embedded in short carrier sentences, proved completely insufficient for the correct identification of the tone classes to which each word belongs (Igarashi 2016a, Matsumori 2016). As a result, a tremendous amount of elicitation is necessary to determine accurately the tone class of each word in these dialects. Fortunately, extensive data on tone class membership have recently been made available for at least two Southern Ryukyuan dialects that preserve the three tone classes of pR; namely, the Ikema dialect of Miyako (Igarashi 2016b, Igarashi et al. 2018) and especially the Tarama dialect of Miyako (Tokuyama and Celik 2020). Although extensive data on tone classes membership in Yaeyama have also become available recently (e.g., Ishigaki [Miyagi 2003], Taketomi [Maeara et al. 2011], and Hatoma [Kajiku 2020]), pR Classes B and C have merged in most Yaeyama dialects, making it impossible to use data for the reconstruction of pR tone classes. This study therefore exploits data from Ikema, Tarama, and Yonaguni as primary data for Southern Ryukyuan to establish pR tone classes from the Northern and Southern Ryukyuan perspectives.

3 Methods

3.1 Data

We exploit two types of resources for reconstructing pR tone classes, primary and secondary data. The primary data are used for the reconstruction of pR tone classes. They consist of the information regarding the tone class membership of eleven dialects, which all preserve the distinction between pR Classes B and C (Table 3).

Table 3: Primary data

Branches	Languages	Dialects	Sources
Northern	Amami	Ashikebu	Uwano (1996a)
		Nakasato	Uwano (2014)
		Asama	Uwano (2017)
		Wadomari	Uwano (2007)
		Yoron (Higashiku variety)	Kiku and Takahashi (2005)
	Okinawa	Ie	Oshio (2009)
		Nakijin (Yonamine variety)	Nakasone (1983)
Southern	Miyako	Shuri	OKJ (1963)
		Tarama	Tokuyama and Celik (2020), the author's field notes
		Ikema (Nishihara variety)	The author's field notes
	Yonaguni	Yonaguni	Uwano (2010, 2013)

The Ashikebu and Nakasato dialects merged Classes A and B. The Ie dialect merged Classes A and C in bimoraic nouns. The Ikema dialect preserves the three-way contrast in pR, but Class A has almost completely merged with Class B for bimoraic nouns (Igarashi 2016b). The other dialects far more faithfully preserve the three-way contrast in pR. The secondary data are used to examine whether a given cognate is widely observed in Ryukyuan dialects and to confirm the correspondences in vowels and consonants between dialects. They consist of seven dialects that merged pR Classes B and C or that do not have tonal contrasts at all (Table 4).

MJ classes are based on Kindaichi (1974), which lists a total of 108 Class 2.4–2.5 nouns. The entries of his vocabulary are written in italics in the MJ forms (Akinaga et al. 1997).

Word forms are provided in broad phonetic transcription. The diacritic “/” indicates a glottalized consonant. Long vowels are represented by a series of identical vowels. “i,” “i,” and “i” are uniformly written as “i.” The pairs “j” and “c” and “z” and “z” are uniformly represented as “c” and “z,” respectively. Moreover, the diacritics “↑” and “↓” designate a pitch rise and fall, respectively. For example, “μ↑μ” (“μ” stands for mora) represents an LH pitch pattern (“L” and “H” stand for low and high pitch, respectively). “μ↑μ↓” is distinguished from “μ↑μ”; when produced in isolation, the two are (nearly) indistinguishable, but when immediately followed by another morpheme such as a case particle, the former is realized as LH-L, whereas the latter is realized as LH-H. In Tarama and Ikema, tonal neutralization occurs with nouns produced in isolation. Tone opposition can be observed, for example, by adding one or more bimoraic particles (one for Tarama and two for Ikema) after the noun. The *-kara* ‘from’ and *-mai* ‘also’ in the tables are bimoraic particles.

A superscript at the end of each word form indicates the correspondence with the pR tone class, where “A,” “B,” and “C” are the pitch patterns corresponding to the pR Class A, Class B, and Class C, respectively. Because of the conditioned merger that occurred in each dialect, one pitch pattern may correspond to more than one class. In that case, more than one letter is used to indicate the correspondence. For example, “AC” indicates that the pitch pattern corresponds to both pR Classes A and C, and “BC” indicates that the pitch pattern corresponds to both pR Classes B and C.

Because we use multiple sources for Tarama, there can be mismatches in the pitch pattern between the sources. In case of discrepancy, the pattern in the author’s field note is adopted first, with that in Tokuyama and Celik (2020) in parentheses; for example, “^(~A).”

3.2 Reconstruction

We postulate the phoneme inventory in Figure 1 for pR. We assume that an intervocalic *w occurred only before *a, an intervocalic *j was allowed only before a back vowel, and *d had already merged with *z before a high vowel. No obligatory glide insertion is assumed between vowels. Thus, the pR noun for “voice,” for example, is reconstructed as *koe instead of *kowe or *koje. We leave aside whether *t, *d, *s, and *z were palatalized before a high vowel. We use a capital *U in cases where we could not decide whether *o or *u was to be reconstructed. Examining the segmental correspondence between dialects is

Table 4: Secondary data

Branches	Languages	Dialects	Sources
Northern	Amami	Yamatohama	Osada et al. (1980)
Southern	Miyako	Irabu (Nakachi variety)	Tomihama (2013)
	Yaeyama	Ishigaki (Shika variety)	Miyagi (2003)
		Taketomi	Maeara et al. (2011)
		Hatoma	Kajiku (2020)
		Hateruma	Hirayama et al. (1967)
		Aragusuku	Miyanaga (1930)

*i	*u	*p	*b	*t	*d	*k	*g
*e	*o			*s	*z		
		*a		*m		*n	
				*w			
							*j
							*r
Vowels				Consonants			

Figure 1: Proposed phoneme inventory in pR.

important for determining whether nouns that are similar in both meaning and form are cognate with each other. The determination of cognacy constitutes an indispensable part of the reconstruction of the pR tone class of the nouns. Furthermore, the correct reconstruction of word-final vowels in pR is crucial for testing the conditioned merger hypothesis. We discuss the issues concerning the segmental reconstruction and cognacy between nouns only if they require argumentation.

When the tonal correspondence between the dialects is irregular, we adopt the principle of parsimony, according to which the reconstruction should require the fewest sound changes. The parsimony is assessed on the basis of the phylogenetic tree proposed by Pellard (2015) (Figure 2). For example, pR *poka ‘outside’ exhibits irregular tonal correspondence (Ashikebu *ɸuka^{AB}*, Asama *ɸukaa^B*, Wadomari *ɸaa^B*, Yoron *huka^C*, Ie *ɸuk'aa^B*, Nakijin *ɸuk'aa^B*, Shuri *ɸuka^B*, Tarama *puka^C*, Ikema *huka^C*, Yonaguni *huga^B*). If we posit pR Class B, then the sporadic sound change B > C is reconstructed to occur two times, each for Yoron and proto-Miyako. By contrast, if we posit pR Class C, then the sporadic sound change C > B is reconstructed to occur five times, each for Ashikebu, Asama, Wadomari, proto-Okinawa, and Yonaguni. Thus, the principle of parsimony judges Class B as more plausible than Class C.

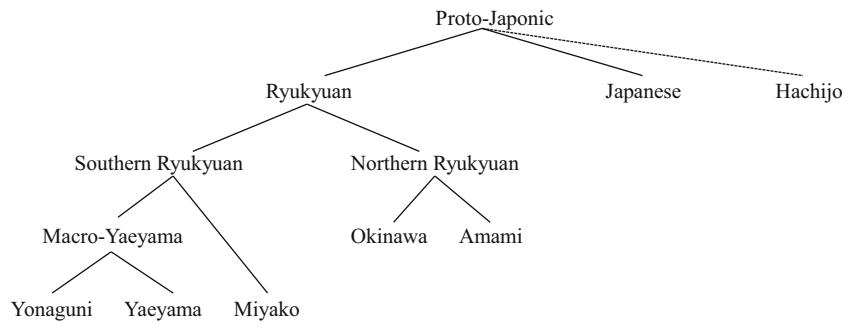


Figure 2: Phylogenetic tree of the Japonic language family proposed by Pellard (2015). The phylogenetic position of Hachijo is controversial, which is indicated by a dotted line.

4 Results

4.1 Confirmation of tone classes reconstructed by previous studies

The survey confirmed that the tone classes reconstructed by previous studies were valid for 52 of the 55 words (Table 5). In the table, nouns that show an irregular tonal correspondence are shaded. In addition, segments that obviously show an irregular correspondence are underlined. The exceptional correspondence exhibited by quite a few dialects in nouns where cognates are found in most dialects can be regarded as the result of sporadic changes in individual dialects and does not affect the reconstruction of tone classes based on the principle of parsimony. Sporadic changes of this sort are not discussed in this section. Some nouns require further commentary, which is provided below.

Table 5: Comparison and reconstruction of Class 2.4–2.5 nouns. Ha79, Hattori (1979a,b); Sh07, Shimabukuro (2007), Ma09, Matsumori (2009), Bo10, de Boer (2010), Ma12, Matsumori (2012)

		1. <i>fari</i> 2.4a 'needle'	2. <i>fasi</i> 2.4a 'chopstick'	3. <i>fera</i> 2.4a 'spatula'	4. <i>fune</i> 2.4a 'boat'		
		pR	*pari C	*pasi C	*pera C	*pune C	
Am.	Ashikebu	ʳhaʳiʳC		ʳhaʳeiʳC	ʳɸəʳraʳC	ʳɸuʳniʳC	
	Nakasato	ʳhaʳiʳC		-	ʳçjʳraʳC	ʳhuʳniʳC	
	Asama	haʳiʳBC		-	ɸiʳraʳC	ɸuuʳniʳC	
	Wadomari	ʳhoʳiʳC		haʳeiʳC	-	çiʳniʳiʳC	
	Yoron	ʳpaiʳC		ʳpacíʳC	ʳpiraʳC	ʳpuniʳC	
Ok.	Ie	pʰaiʳABC		-	pʰiraʳAC	kʰuniʳAC	
	Nakijin	ʳpʰaʳiʳC		-	ʳpʰiʳraaʳC	ʳpʰuʳniʳC	
	Shuri	haaiʳC		haaciʳC	ɸiiraʳC	ɸupiʳB	
Mi.	Tarama	pa˥C-mai		pa˥siC-mai	pi˥raC-mai	fu˥niC-mai	
	Ikema	haiC-kara˥-mai		hasiC-kara˥-mai	hiraC-kara˥-mai	funiC-kara˥-mai	
Yo.	Yonaguni	ʳhaiʳC		haʳteiʳC	hiʳraC	nʳniʳC	
Notes		Ha79 C, Sh07 C, Ma09 C, Bo10 C, Ma12 C	Ha79 C, Sh07 C, Bo10 C	Ha79 C, Ma09 C, Bo10 C	Ha79 C, Ma09 C, Bo10 C		
		5. <i>iki</i> 2.4a 'breath'	6. <i>ito</i> 2.4a 'thread'	7. <i>jado</i> 2.4a 'shelter'	8. <i>kefu</i> 2.4a 'today'		
		pR	*iki C	*ito C	*jado C	*keu C	
Am.	Ashikebu	ʳ?i˥kíC		ʳ?i˥toC	-	ʳkju˥uC	
	Nakasato	ʳ?i˥teiC		i˥te'u˥uC	-	ʳsu˥uC	
	Asama	ʳ?i˥kiAC		ʳ?iteuʳB	jaa˥duC	ʳkjuuAC	
	Wadomari	ʳ?i˥teiC		i˥teuC	-	ʳçuu˥C	
	Yoron	ʳikiC		it˥teuuC	ʳjaduC	ʳeuuC	
Ok.	Ie	ʳiteiC		ʳite'u˥AC	jadu˥AC	teʰu˥uAC	
	Nakijin	ʳ?i˥tz'iC		ʳ?i˥tz'uC	ʳja˥duC	ʳkʰu˥uC	
	Shuri	ʳiiteiC		ʳiiteuC	jaaduC	teuuBC	
Mi.	Tarama	i˥kiC-mai		i˥tuC-mai	ja˥duC-mai (‐B)	ki˥uB-mai	
	Ikema	itsiC-kara˥-mai		ituC-kara˥-mai	jaduC-kara˥-mai	kjuuC-kara˥-mai	
Yo.	Yonaguni	i˥t'iC		i˥t'uC	da˥duC	ʳsuumC	
Notes		Ha79 C, Sh07 C, Bo10 C, Ma12 C	Ma09 C, Bo10 C, Ma12 C	Ha79 C, Bo10 C	Ha79 C, Bo10 C	Ma09 B	
		9. <i>matu</i> 2.4a 'pine'	10. <i>naka</i> 2.4a 'middle'	11. <i>nusi</i> 2.4a 'owner'	12. <i>obi</i> 2.4a 'girdle, hoop'		
		pR	*matu C	*naka C	*nosi C	*obi C	
Am.	Ashikebu	ʳma˥t'iC		ʳna˥laC	ʳno˥eiC	-	
	Nakasato	ʳma˥t'uC		ʳna˥laC	-	ʳu˥biAB	
	Asama	maa˥tsiC		ʳnaaAC	nuu˥siC	ʳ?uu˥biAC	
	Wadomari	-		ʳnaaA	-	ʳ?u˥biC	
	Yoron	ʳmateiC		ʳnaaC	ʳnu eiC	ʳubiC	
Ok.	Ie	matsiC		naha˥AC	-	ʳuu˥biC	
	Nakijin	ʳma˥tz'iC		ʳna˥haaC	ʳnu eiC	-	
	Shuri	maateiC		naakaC	nuueiC	ʳuubiC	
Mi.	Tarama	ma˥tsiC-mai		na˥kaC-mai	nu˥siC-mai	ubi˥C-mai	
	Ikema	matsiC-kara˥-mai		nakaC-kara˥-mai	nusiC-kara˥-mai	ubi˥B-kara-ʳmai	
Yo.	Yonaguni	ma˥teiC		na˥gaC	nu˥teiC	-	
Notes		Ha79 C, Ma09, C Bo10 C, Ma12 C	Ha79 C, Ma09 C, Bo10 C, Ma12 C	Ha79 C, Bo10 C	Ha79 C, Bo10 C	Bo10 C	

(Continued)

Table 5: *Continued*

		13. <i>sora</i> 2.4a 'sky, treetop'	14. <i>sudi</i> 2.4a 'sinew'	15. <i>omi</i> 2.4a 'sea'	16. <i>usu</i> 2.4a 'mortar'
	pR	*sora C	*suzi C	*omi C	*Usu C
Am.	Ashikbu	-	†si ¹ di ^C	†?u ¹ mi ^C	†?u ¹ si ^C
	Nakasato	su ¹ ra ¹ ‡ ^C	†su ¹ zi ^C	†?u ¹ mi ^C	†?u ¹ su ^C
	Asama	euu ¹ ra ^C	si ¹ zi ^C	†?u ¹ AC	†?u ¹ si ^{AC}
	Wadomari	su ¹ ra ¹ C	†eizi ^C	?u ¹ ni ¹ C	?u ¹ ei ¹ C
	Yoron	†sura ^C	ei ¹ zi ¹ C	†u ¹ AC	†uei ^C
Ok.	Ie	sura ¹ AC	sidzi ¹ AC	?uni ¹ AC	?usi ¹ AC
	Nakijin	†su ¹ raa ^C	†ei ¹ dzi ^C	†?u ¹ mi ^C	†?u ¹ ei ^C
	Shuri	suura ^C	sidzi ^B	?umi ^B	?uusi ^C
Mi.	Tarama	eu ¹ ra ^C -mai	si ¹ dzi ^C -mai	i ¹ m ^C -mai	u ¹ si ^C -mai
	Ikema	sura ^C -kara ¹ -mai	sizi ¹ B-kara ¹ -mai	i ¹ j ^C -kara ¹ -mai	usi ^C -kara ¹ -mai
Yo.	Yonaguni	-	-	-	u ¹ te ¹ i ^C
Notes		Ma09 C, Ma12 C	Ha79 C, Bo10 C	Ha79 C, Sh07 C, Ma09 C, Bo10 C, Ma12 C	Ha79 C, Sh07 C, Ma09 C, Bo10 C, Ma12 C
		17. <i>kage</i> 2.5a 'shade, shadow'	18. <i>kowe</i> 2.5a 'voice'	19. <i>kumo</i> 2.5a 'spider'	20. <i>mafe</i> 2.5a 'front'
	pR	*kage C	*koe C	*kobu C	*mae C
Am.	Ashikebu	ka ¹ g ⁹ AB	†ku ¹ i ^C	†ku ¹ bu ^C	†m ⁹ g ^C
	Nakasato	†ha ¹ ŋj ⁱ C	†ku ¹ i ^C	-	†me ¹ e ^C
	Asama	kaa ¹ g ⁱ C	ku ¹ i ^{BC}	-	†m ⁹ g ^{AC}
	Wadomari	ha ¹ gi ¹ C	†ɸu ¹ i ^C	-	†me ¹ e ^C
	Yoron	†hagi ^C	†hui ^C	†hubu ^C	†mee ^C
Ok.	Ie	hagi ¹ AC	k ^h wi ¹ i ^{AC}	†k ^h ubu ¹ AC	me ¹ e ^{AC}
	Nakijin	†ha ¹ gi ^C	†ɸu ¹ i ^C	†ɸu ¹ bu ^C	†me ¹ e ^C
	Shuri	kaagi ^C	kwii ^{BC}	kubu ^B	mee ^{BC}
Mi.	Tarama	ka ¹ g ⁱ C-mai	ku ¹ i ^C -mai	ku ¹ vu ^C -mai	ma ¹ i ^C -mai
	Ikema	kagi ^C -kara ¹ -mai	kui ^C -kara ¹ -mai	-	mai ^C -kara ¹ -mai
Yo.	Yonaguni	ka ¹ ŋŋj ⁱ C	†kui ^C	ku ¹ bu ^C	†mai ⁱ C
Notes		Ha79 C, Sh07 C, Ma09 C, Bo10 C, Ma12 C	Ha79 C, Sh07 C, Ma09 C, Bo10 C, Ma12 C	Ha79 C, Bo10 C	Ma12 C
		21. <i>muko</i> 2.5a 'bridegroom'	22. <i>nabe</i> 2.5a 'pot'	23. <i>saru</i> 2.5a 'monkey'	24. <i>tabi</i> 2.5a 'socks'
	pR	*moko C	*nabe C	*saru C	*tabi C
Am.	Ashikebu	†mo ¹ ho ^C	†na ¹ b ⁹ C	†sa ¹ ru ^C	ta ¹ bi ^{AB}
	Nakasato	-	†na ¹ bi ^C	sa ¹ ru ¹ u ^C	†ta ¹ bi ^C
	Asama	-	naa ¹ bi ^C	ea ¹ ru ^C	taa ¹ bi ^C
	Wadomari	-	na ¹ bi ¹ C	-	-
	Yoron	-	†nabi ^C	†saru ^C	†tabi ^C
Ok.	Ie	muɸu ¹ AC	nabi ¹ AC	saru ¹ AC	t ^h abi ¹ AC
	Nakijin	†mu ¹ ɸu ^C	†na ¹ bi ^C	†sa ¹ ru ^C	†t ^h a ¹ bi ^C
	Shuri	muuku ^C	naabi ^C	saaru ^C	taabi ^C
Mi.	Tarama	mu ¹ ku ^C -mai	na ¹ bi ^C -mai	ea ¹ l ^C -mai	taa ¹ bi ^C -mai
	Ikema	muku ^C -kara ¹ -mai	nabi ^C -kara ¹ -mai	sai ^C -kara ¹ -mai	tabi ¹ B-kara ¹ -mai
Yo.	Yonaguni	mu ¹ gu ¹ C	na ¹ bi ¹ C	sa ¹ ru ¹ C	ta ¹ bi ¹ C
Notes		Ha79 C, Sh07 C, Bo10 C	Ha79 C, Ma09 C, Bo10 C, Ma12 C	Ha79 C, Ma09 C, Bo10 C, Ma12 C	Ha79 C, Ma09 C, Bo10 C

(Continued)

Table 5: *Continued*

		25. <i>tuju</i> 2.5a 'dew'	26. <i>woke</i> 2.5a 'bucket'	27. <i>afa</i> 2.4b 'millet'	28. <i>foka</i> 2.4b 'outside'	
		pR	* <i>tuju</i> C	* <i>woke</i> C	* <i>awa</i> B	* <i>poka</i> B
Am.	Ashikebu		†t'í ¹ ju ^C	†wí ¹ i ^C	?a ¹ wa ^{AB}	ɸu ¹ ka ^{AB}
	Nakasato		†t'u ¹ ju ^C	†jí ¹ i ^C	?a ¹ wa ^{AB}	-
	Asama		†ts'í ¹ ju ^{AC}	†wí ¹ AC	†?oo ^{AC}	ɸuka ¹ a ^B
	Wadomari		†teuu ^A	†wu ¹ i ^C	-	†fa ¹ a ^B
	Yoron		†teuu ^C	†hui ^C	o ¹ o ^B	†huka ^C
Ok.	Ie		siju ^{1AC}	wuk ¹ i ^{AC}	?awa ¹ a ^B	ɸuk'a ¹ a ^B
	Nakijin		†tz'í ¹ ju ^C	†ɸu ¹ k ^{hi} ^C	?awa ¹ a ^B	ɸuk'a ¹ a ^B
	Shuri		teiju ^B	wuuki ^C	?awa ^B	ɸuka ^B
Mi.	Tarama		tsi ¹ v-mai ^C	gu ¹ k ¹ i ^C -mai	aa ^B -ma ¹ i	pu ¹ ka ^C -mai
	Ikema		teuu ^C -kara ¹ -mai	-	aa ^{1B} -kara- ¹ mai	huka ^C -kara ¹ -mai
Yo.	Yonaguni		te ¹ i ¹ ju ^{1C}	u ¹ gi ^{1C}	aa ^B	huga ^B
Notes			Ha79 C, Ma09 C, Bo10 C, Ma12 C	Ha79 C, Sh07 C, Ma09 C, Bo10 C, Ma12 C	Ha79 B, Bo10 B	Ma09 B
		29. <i>ine</i> 2.4b 'rice plant'	30. <i>ita</i> 2.4b 'board'	31. <i>kado</i> 2.4b 'corner'	32. <i>kama</i> 2.5b 'sickle'	
		pR	* <i>ine</i> B	* <i>ita</i> B	* <i>kado</i> B	* <i>kama</i> B
Am.	Ashikebu		†?nji ^{ABC}	?i ¹ ta ^{AB}	-	ka ¹ ma ^{AB}
	Nakasato		?i ¹ ni ^{AB}	?i ¹ t'a ^{AB}	ka ¹ du ^{AB}	ha ¹ ma ^{AB}
	Asama		?ini ¹ i ^B	?itea ¹ a ^B	-	kama ¹ a ^B
	Wadomari		†?i ¹ ni ¹ i ^B	†?i ¹ itea ¹ a ^B	-	-
	Yoron		-	i ¹ te ¹ a ^B	ha ¹ du ^B	ha ¹ ma ^B
Ok.	Ie		-	?it'a ¹ a ^B	hadu ¹ u ^B	hama ^{1AC}
	Nakijin		-	hit ¹ z'a ¹ a ^B	hadu ¹ u ^B	ha ¹ maa ^A
	Shuri		?jni ^{BC}	?ite ¹ a ^B	kadu ^B	†ka ¹ ma ^A
Mi.	Tarama		-	ita ^B -ma ¹ i ^(~A)	kadu ^B -ma ¹ i	-
	Ikema		-	itea ^{1B} -kara- ¹ mai	kadu ^{1B} -kara- ¹ mai	-
Yo.	Yonaguni		nni ^B	it'a ^B	kadu ^B	-
Notes		Bo10 B	Ha79 B, Sh07 B, Ma09 B, Bo10 B, Ma12 B	Ma09 B, Bo10 B	Ma12 B	
		33. <i>kasa</i> 2.4b 'umbrella'	34. <i>kasu</i> 2.4b 'dregs'	35. <i>kata</i> 2.4b 'shoulder'	36. <i>kinu</i> 2.4b 'garment'	
		pR	* <i>kasa</i> B	* <i>kasu</i> B	* <i>kata</i> B	* <i>kinu</i> B
Am.	Ashikebu		ka ¹ sa ^{AB}	ka ¹ si ^{AB}	ka ¹ ta ^{AB}	-
	Nakasato		ha ¹ sa ^{AB}	ka ¹ su ^{AB}	ha ¹ t'a ^{AB}	tei ¹ N ^{AB}
	Asama		ka ¹ ea ¹ a ^B	-	kata ¹ a ^B	k'i ¹ N ^{BC}
	Wadomari		†ha ¹ sa ^{AB}	-	-	-
	Yoron		ha ¹ sa ^B	ha ¹ ei ^B	ha ¹ ta ^B	ki ¹ N ^B
Ok.	Ie		hasa ¹ a ^B	hasi ¹ i ^B	hat'a ¹ a ^B	tei ¹ u ^B
	Nakijin		hasa ¹ a ^B	hae ¹ i ^B	hat'a ¹ a ^B	tz'inu ¹ u ^B
	Shuri		kasa ^B	kasi ^B	kata ^B	tei ¹ BC
Mi.	Tarama		ka ¹ ea ^B -ma ¹ i	kasi ^B -ma ¹ i	kata ^B -ma ¹ i ^(~A)	kin ^B -ma ¹ i
	Ikema		-	kasi ^{1B} -kara- ¹ mai	-	tsi ¹ B-kara- ¹ mai
Yo.	Yonaguni		kasa ^B	kate ¹ i ^B	-	-
Notes		Ha79 B, Ma09 B, Ma12 B Bo10 B	Ha79 B, Bo10 B	Ha79 B, Sh07 B, Ma09 B, Bo10 B, Ma12 B	Ma09 B, Ma12 B	

(Continued)

Table 5: *Continued*

		37. <i>mino</i> 2.4b 'rain cape'	38. <i>miso</i> 2.4b 'bean paste'	39. <i>mugi</i> 2.4b 'barley'	40. <i>nomi</i> 2.4b 'chisel'	
		pR	* <i>mino</i> B	* <i>miso</i> B	* <i>mogi</i> B	* <i>nomi</i> B
Am.	Ashikebu	ᵣn̪jᵣu ^{ABC}		miᵣsu ^{AB}	muᵣgi ^{AB}	nuᵣi ^{AB}
	Nakasato	-		miᵣsu ^{AB}	muᵣni ^{AB}	nuᵣni ^{AB}
	Asama	mjoᵣo ^B		mieuᵣu ^B	mugiᵣi ^B	numiᵣi ^B
	Wadomari	-		ᵣmiᵣeuᵣu ^B	ᵣmuᵣdziᵣi ^B	-
	Yoron	-		miᵣeu ^B	muᵣgi ^B	nuᵣN ^B
Ok.	Ie	juᵣu ^B		neuᵣu ^B	mudziᵣi ^B	nuniᵣi ^B
	Nakijin	nuᵣu ^B		misuᵣu ^B	mudziᵣi ^B	numiᵣi ^B
	Shuri	?nnu ^{BC}		nsu ^B	mudzi ^B	numi ^B
Mi.	Tarama	mnu ^B -ma ^l i ^(~A)		meu ^A -mai	mugi ^B -ma ^l i	nu ^l m ^C -mai
	Ikema	nnu ^{lB} -kara- ^r mai		nsu ^{lB} -kara- ^r mai	muzi ^{lB} -kara- ^r mai	nu ^{lB} -kara- ^r mai
Yo.	Yonaguni	nnu ^B		n ^r su ^{lC}	mun ^B	nun ^B
Notes		Ma09 B	Ma09 B, Bo10 B, Ma12 B	Ha79 B, Ma09 B, Ma12 B, Bo10 B	Ha79 B, Bo10 B	
		41. <i>siru</i> 2.4b 'soup'	42. <i>soto</i> 2.5b 'outside'	43. <i>tane</i> 2.4b 'seed'	44. <i>uri</i> 2.4b 'melon'	
		pR	* <i>siru</i> B	* <i>soto</i> B	* <i>tane</i> B	* <i>ori</i> B
Am.	Ashikebu	euᵣu ^{AB}		suᵣtu ^{AB}	taᵣni ^{AB}	?uᵣri ^{AB}
	Nakasato	eiᵣu ^{AB}		suᵣt'u ^{AB}	taᵣni ^{AB}	ᵣ?u ^l ri ^C
	Asama	siruᵣu ^B		eutuᵣu ^B	tanif ^B	-
	Wadomari	-		-	ᵣta ^l ni ^l i ^B	-
	Yoron	eiᵣu ^B		-	taᵣni ^B	uᵣi ^B
Ok.	Ie	ei ^r u ^B		-	ᵣ ^b ani ^l i ^B	uui ^{lABC}
	Nakijin	ei ^r u ^B		sut'u ^B	ᵣ ^b ani ^l i ^B	?u ^l i ^B
	Shuri	ei ^r u ^{BC}		-	tapi ^B	?ui ^B
Mi.	Tarama	si ^{lB} -ma ^l i ^(~A)		-	tani ^B -ma ^l i	-
	Ikema	-		-	tani ^C -kara ^l -mai	ui ^{lB} -kara- ^r mai
Yo.	Yonaguni	te'iru ^B		-	tani ^B	ui ^B
Notes		Ha79 B, Ma09, B Bo10 B, Ma12 B	Ha79 B	Bo10 B	Ma09 B, Bo10 B	
		45. <i>wara</i> 2.4b 'straw'	46. <i>zeni</i> 2.4b 'money'	47. <i>ame</i> 2.5b 'rain'	48. <i>ase</i> 2.5b 'sweat'	
		pR	* <i>wara</i> B	* <i>zeni</i> B	* <i>ame</i>	* <i>ase</i> B
Am.	Ashikebu	waᵣa ^{AB}		ziᵣN ^{AB}	ᵣaᵣmi ^{AB}	?aᵣsi ^{AB}
	Nakasato	waᵣa ^{AB}		ziᵣN ^{AB}	ᵣaᵣmi ^{AB}	ᵣaᵣei ^{AB}
	Asama	waraᵣa ^B		dziᵣN ^{BC}	ᵣamiᵣi ^B	ᵣaciᵣi ^B
	Wadomari	-		-	ᵣ ^b aᵣmif ^l i ^B	ᵣ ^b aᵣei ^{lC}
	Yoron	waᵣa ^B		ziᵣN ^B	aᵣmi ^B	aᵣei ^B
Ok.	Ie	waraᵣa ^B		dzini ^l i ^B	ᵣamiᵣi ^B	ᵣasiᵣi ^B
	Nakijin	waraᵣa ^B		dzini ^l i ^B	ᵣamiᵣi ^B	haci ^l i ^B
	Shuri	wara ^{BC}		dzin ^B	ᵣami ^B	ᵣaci ^B
Mi.	Tarama	ba ^l ra ^C -mai		dzin ^B -ma ^l i	ami ^B -ma ^l i	aci ^B -ma ^l i
	Ikema	bara ^{lB} -kara- ^r mai		din ^{lB} -kara- ^r mai	ami ^{lB} -kara- ^r mai	aci ^{lB} -kara- ^r mai
Yo.	Yonaguni	bara ^B		din ^B	ami ^B	aci ^B
Notes		Ha79 B, Ma09, B Bo10 B, Ma12 B	Ma09 B	Ha79 B, Sh07 B, Ma09 B, Bo10 B, Ma12 B	Ha79 B, Sh07 B, Bo10	

(Continued)

Table 5: *Continued*

		49. <i>mado</i> 2.5b 'window' > 'spare time'	50. <i>maju</i> 2.5b 'eyebrow'	51. <i>momo</i> 2.5b 'thigh'	52. <i>joru</i> 2.4b~2.5b 'night'	
		pR	*mado B	*majo B	*momo B	*joru B
Am.	Ashikebu	-		ma ^Γ jo ^{AB}	mo ^Γ o ^{AB}	ju ^Γ ru ^{AB}
	Nakasato	-		ma ^Γ ju ^{AB}	mu ^Γ mu ^{AB}	ju ^Γ ru ^{AB}
	Asama	madu ^Γ u ^B		maju ^Γ u ^B	munu ^Γ u ^B	jucu ^Γ u ^B
	Wadomari	-		-	r ^Γ mu ^Γ nu ^Γ u ^B	r ^Γ ji ^Γ ru ^Γ u ^B
	Yoron	ma ^Γ du ^B		-	mu ^Γ mu ^B	ju ^Γ ru ^B
Ok.	Ie	madu ^Γ u ^B		maju ^Γ u ^B	mumu ^Γ u ^B	juru ^Γ u ^B
	Nakijin	madu ^Γ u ^B		maju ^Γ u ^B	mumu ^Γ u ^B	juru ^Γ u ^B
	Shuri	madu ^B		maju ^B	mumu ^B	juru ^B
Mi.	Tarama	ma ^Γ l ^C du ^C -mai		maju ^B -ma ^Γ i	mumu ^A -mai	ju ^Γ l ^B -ma ^Γ i
	Ikema	madu ^C -kara ^Γ -mai		maju ^Γ B-kara- ^Γ mai	mumu ^Γ B-kara- ^Γ mai	ju ^Γ i ^Γ B-kara- ^Γ mai
Yo.	Yonaguni	-		maju ^B	mumu ^B	duru ^B
Notes		Ma09 B, Ma12 B	Ha79 B		Ha79 B, Ma09 B, Bo10 B	Ha79 B, Ma09 B, Ma12 B

13. *sora C 'treetop': Matsumori (2009, 2012) also reconstructs Class C for *sora 'treetop,' although she may not agree with the view that pR *sora C 'treetop' is related to MJ *sora* 2.4 'sky.' In the tenth century, Japanese *sora* referring to not only 'sky' but also 'the upper part of an object (such as roof, ceiling, and treetop)' is attested (NKDJ 2001, 507). This means that at the stage of MJ at the latest, Japanese *sora* also had a meaning equivalent to that of pR. This study does not examine the question of whether the pJ cognate had the meaning of 'the upper part of an object.' What is clear from the above discussion is that the semantic change between 'sky' and 'the upper part of an object' is a natural process, and that pR *sora 'treetop' is reasonably regarded as the cognate of MJ *sora* 2.4 'sky.' Note that pR *sora does not have a meaning 'sky,' which is indicated instead by a Chinese loan pR *ten A.

21. *moko C 'bridegroom': Nakasato, Asama, and Yoron have *mukk'a^C* 'bridegroom,' *mukk'wa* 'id.,' and *muukwaa^C* 'id.,' respectively. They must be polymorphemic, consisting of pR *moko C 'bridegroom' and pR *kua A 'child,' or they arose through reanalysis of the second syllable of pR *moko C 'bridegroom' as pR *kua A 'child.' The regular tonal correspondence allow reconstruction of pR *moko C 'bridegroom.'

25. *tuju C 'dew': Whether the pR form of 'dew' is *tuju or *tujo becomes clear when comparing 'dew' with pR *tujo- 'strong' in Ishigaki and Hatoma, Ishigaki *tcuu^{BC}* 'dew' and *tsuu-* 'strong,' and Hatoma *cuu^{BC}* 'dew' and *suu-* 'strong.' They are distinguished by the palatalization of the consonant. For this, pR *tuju 'dew' is reconstructed. Tarama *tsiv^C* 'dew' may not seem to be a reflex of pR *tuju 'id.' However, the sound change pR *ju > v is confirmed by pR *suju- 'sour,' reflected in Tarama *siv-* 'id.'⁶ In Irabu, pR *tuju 'dew' and

⁶ The sound change pR *ju > v based on *tsiv* 'dew' and *siv-* 'sour' (<'astringent') in Miyako was first discovered by Kenan Celik (personal communication). I acknowledge that this study's argument about pR *tuju 'dew,' *suju- 'sour,' and later discussed *subu- 'astringent' owes much to the discussion with Kenan Celik. An additional argument is required to test whether the pR 'sour' is *suju-, not *su-. In many Ryukyuan dialects, 'sour' has the same segmental makeup as pR *su B 'vinegar' and pR *su B 'nest' (Nakijin, *cii-* 'sour,' *cii^B* 'vinegar,' *cii^B* 'nest'; Shuri *sii-* 'sour,' *sii^{BC}* 'vinegar,' *sii^{BC}* 'nest'; Ishigaki *sii-* 'sour,' *sii^{BC}* 'nest'), which seems to suggest pR *su- 'sour.' In Taketomi, however, 'sour' differs from 'nest,' the former being *cii-* and the latter *suu-*. The (alveolo-)palatal consonant and front vowel in 'sour' indicate that the pR 'sour' has a segment with a feature [-back], such as *i and *j. In Yoron, although *cii-* 'sour' has the same segmental makeup as *cii^B* 'nest,' it is exceptional in that its adjective ending takes -can rather than -san. The ending -can is regarded to be attached to roots that end in *si (so-called *shiku-katsuyō*,

*suju- 'sour' are also reflected as *tsiv* and *siv-*. Thus, the change pR *ju > v/*{s, t}u_ can be reconstructed in proto-Miyako.⁷

26. *woke C 'bucket': The correspondence of the word-initial consonant is irregular in Nakijin, Tarama, and Yonaguni, suggesting that sporadic sound changes occurred in these dialects. These changes, though irregular, are phonetically motivated at least for Nakijin and Tarama; in Nakijin, *w* became \emptyset by assimilating its voicing to that of the consonant in the following syllable, and in Tarama, *b (<*w through a regular sound change) became *g* by assimilating its place of articulation to the consonant in the following syllable. The tonal correspondences are regular throughout all dialects. These facts indicate that these nouns are inherited from pR, allowing us to reconstruct pR *woke C 'bucket.'

32. *kama B 'sickle': Although Matsumori (2012) reconstructs Class B, only Amami exhibits pitch patterns corresponding to pR Class B according to our survey. The pitch patterns in Okinawa, in contrast, correspond to Class A. The cognates are perhaps absent in Southern Ryukyuan, where reflexes of pR *irana C 'sickle' are attested instead (Tarama *izara*^C, Ikema *zzara*^C, Ishigaki *Pirana*^{BC}, Yonaguni *irara*^C). They are also attested in Okinawa (Nakijin *?inaana*^C, Shuri *?irana*^C). Regardless of whether the pR Class of *kama is reconstructed as A or B, the number of reconstructed changes remains the same: the change A > B in proto-Amami or the change B > A in proto-Okinawa. Because Class B or C is a regular correspondence with MJ Class 2.4, it is more plausible to reconstruct pR Class B for *kama 'sickle' and a subsequent sporadic change B > A in proto-Okinawa.

36. *kinu B 'garment': The noun listed as a Class 2.4 noun in Kindaichi (1974) is not *kinu* 'garment' but *kinu* 'silk.' They both are also attested in OJ, the oldest attested stage of Japanese, and are generally recognized as cognates (Jodaigo 1967, Martin 1987). Their pitch patterns are both LH in MJ (Akinaga et al. 1997), a regular reflex of Class 2.4 in MJ. Additionally, there are modern Japanese dialects with *kinu* 'garment' also corresponding to Class 2.4 (Hirayama et al. eds. 1992–93). Reflexes of pR *kinu B 'garment' are observed throughout Ryukyu Islands. However, only a few dialects have nouns for 'silk,' in which the

e.g., pR *otorosi- 'horrible' > Yoron *uturu-can* 'id.') (Kiku and Takahashi 2005, 224); however, in *cii-can* 'sour,' its root does not end in *si. The palatalization of the onset consonant of -san should not be the result of the progressive assimilation caused by the synchronic root-final vowel *i* because the root-final *i* derived from pR *u does not cause palatalization as in *atci-san* 'hot' (<pR *atu- 'id.'). It follows that pR 'sour,' just as pR *otorosi- 'horrible,' had [-back] in the root-final syllable in pR, which palatalized the onset consonant of an adjective ending. Therefore, the pR 'sour' cannot be *su-. In Japanese dialects, both *su-* and forms with a feature [-back] such as *suju-*, *sui-*, and *cii-* are indeed observed as an adjective 'sour,' as expected from Ryukyuan cognates. A rough representation of the distribution of the forms for 'sour' is as follows: *suju-*, *sui-*, and *cii-* in Kyushu, *sui-* in Chugoku and Shikoku Districts, *su-* in Kansai and Chubu Districts, *suppa-* in Kanto District, and *sukka-* in Tohoku Districts (LA 1966–1974, Map 41). The three forms *suju-*, *sui-*, and *cii-* can be regarded as reflexes of pJ *suju- 'sour.' The fact that the three forms are geographically distributed in areas close to the Ryukyus also supports pR *suju- 'sour.'

⁷ A reviewer suggests that Tarama *tsiv* 'dew' is the result of a contamination with pR *tubu C 'grain, droplet' rather than being a cognate with pR *tuju C 'dew.' As discussed in Section 2.4, however, there is good reason to assume that pR *tubu cannot be reflected as *tsiv* in Tarama. The same reviewer also suggests that Tarama *siv-* 'sour' is cognate with *sibu- 'astringent' rather than *suju- 'sour.' However, this hypothesis is not necessarily sufficient to explain the aspect of the adjectives for 'sour' and 'astringent' in Miyako. Of the four varieties of Miyako described by Hirayama et al. (1992–93), *siv-* only means both 'sour' and 'astringent' in Hirara. In other varieties, *siv-* (in the case of Ikema, *suu-* because of a further sound change *v > u) only signifies 'sour'; the meaning 'astringent' is signified by other adjectives such as *futsigoo-* in Tarama, *ŋgja-* in Ikema, and *sitakupal-* in Irabu-Nagahama. The hypothesis that *siv-* 'sour' is derived from *sibu- 'astringent' presupposes four changes: the loss of the form *suju-, a semantic change in which *sibu- comes to mean 'sour' in addition to 'astringent,' the birth of a new word signifying 'astringent,' and the loss of the meaning 'sour' in *sibu-. This hypothesis fails to explain the motivation for the loss of the form *suju-. In contrast, the hypothesis of this study explains it as a result of a homonymic clash between *suju and *sibu- caused by regular sound changes. We have postulated a regular sound change *suju- > *siv-*. This form is the same as *siv-* derived from *sibu- through a regular sound change that spirantizes *bu into v(u) in many environments (see Section 4.2). The homonymic clash should have resulted in a polysemic adjective *siv-* 'sour, astringent,' which remains as it is in Hirara. In other varieties, new words for 'astringent' such as Tarama *futsigoo-* are thought to have been coined so as to avoid the semantic merger between 'sour' and 'astringent.' Therefore, the hypothesis of this study can more parsimoniously explain the aspect of adjectives for 'sour' and 'astringent' in Miyako as the result of three well-motivated changes, namely, the homophonic clash because of regular sound changes, the birth of an adjective exclusively expressing 'astringent,' and the loss of the meaning of 'astringent' in *siv-*.

tonal and segmental correspondence is irregular (cf. Yamatohama *k'in* 'garment' vs *k'in* 'garment'; Asama *kin*^{BC} 'garment' vs *k'inuu*^A 'silk'; Yoron *kin*^B 'garment' vs *kinu*^B 'silk'). It is suggested, therefore, that pR **kinu* B lacked the meaning 'silk' and that apparently related Ryukyuan forms for 'silk' are Japanese loans. In any case, the fact that MJ and some Japanese dialects have *kinu* 'garment' belonging to Class 2.4 indicates that, regardless of whether 'garment' and 'silk' are cognates, the tone class of pR **kinu* 'garment' is 2.4b.

38. *miso B 'bean paste': Matsumori (2012) reconstructs Class B. Tonal correspondence is regular between the dialects of Northern Ryukyuan but irregular between the dialects of Southern Ryukyuan. The former suggests that the pR Class of **miso* is Class B, whereas the latter suggests it can be Class A, B, or C. The irregular tonal correspondence may suggest that borrowing is involved in this noun. However, the segmental correspondence is perfectly regular, which decreases the plausibility of the borrowing hypothesis. We, therefore, assume that the reflexes are inherited from pR, and the irregularity in the tonal correspondence is due to sporadic changes independently occurring in each dialect. Because Class B requires the minimal number of sound changes, we reconstruct Class B for pR **miso*.

42. *soto B 'outside': Hattori (1979a,b) reconstructs Class B. In our primary data, reflexes of pR **soto* exhibit a limited distribution. Hattori (1979a,b) reveals that its reflexes are observed in many dialects of Amami (in addition to Asama *cutuu*^B, Kametsu *cutu*^B, Shodon *sit'uu*^{BC}, Naze *sut'u*^B, Aden *sut'u*^B, and Onotsu *sut'u*^{BC}). Because the tonal correspondences between dialects are regular and the reflexes are observed both in Amami and Okinawa, we assume that they were inherited from pR **soto* 'outside.' The lack of its attestation in Southern Ryukyuan may be because its reflexes were replaced by almost synonymous pR **poka* B 'outside.'

49. *mado B 'spare time': Matsumori (2009, 2012) also reconstructs Class B for **mado* 'spare time,' although she may not agree with the view that pR **mado* 'spare time' is related to MJ Class 2.4 MJ *mado* 'window.' We postulate a metaphoric semantic change 'window' > 'spare time,' that is, the change from 'special gap' to 'temporal gap.' This type of change is also observed in other languages such as Russian (cf. *окно* 'window,' *окно между лекциями* 'spare time between lectures') (Morkovkin et al. [eds.] 2016, 678). The nouns for 'window' *per se* are scarcely attested in Ryukyuan. Even if they are, they tend to be unrelated to MJ *mado* 2.5, as in Shuri *haciru*^{BC} 'sliding window,' *takabaciru*^{BC} 'high window,' and Ishigaki *takaafusara*^{BC} 'high window.' It is true that Taketomi and Yonaguni have *mədu* 'window' and Yonaguni *madu*^B 'window,' respectively, but they may be a Japanese loan. The Yonaguni *madu*^B 'window' recorded by Uwano (2013) is especially controversial, because, as pointed out by the author, the same speaker produces *amadu*^A 'window' instead of *madu*^B, as described in an earlier study (Uwano 2010). Thus, a plausible scenario is that at the stage of pR, **mado* lost its original meaning of 'window,' whereas the form **mado* itself survived with its meaning metaphorically changed from 'window' to 'spare time.'

50. *majo B 'eyebrow': Although Martin (1987) regards MJ *maju* 2.5 'eyebrow' and *maju* 2.5 'cocoon' as cognates, they are listed as separate entries in the present study. Although the evidence for a distinction between pR **ju* and **jo* is in general scarce in modern Ryukyuan dialects (Pellard 2023), we reconstruct pR **majo*, not **maju*, based on the following evidence.⁸ The final syllable of pR **majo* B 'eyebrow' is reflected differently from that of pR **kaju* A 'porridge' in many Ryukyuan dialects (Ashikebu *majo*^{AB} 'eyebrow' vs *kai*^{AB} 'porridge'; Shuri *maju*^B 'eyebrow' vs *kee*^A 'porridge'; Hatoma *maju* 'eyebrow' vs *kai* 'porridge'; Ishigaki *majoo*^{BC} 'eyebrow' vs *kai*^A 'porridge'). Although it still seems possible to reconstruct pR **kai*, not **kaju*, for 'porridge,' this hypothesis is rejected because the second syllable of pR **kaju* 'porridge' yields different forms from that of pR **mai* A 'rice' in at least two Yaeyama dialects, namely, Hateruma (*kee* 'porridge' vs *mëë* 'rice') and Aragusuku (*kai* 'porridge' vs *maji* 'rice'). The correspondence with MJ *kaju* 2.1 'porridge' also provides an additional support for the reconstruction of pR **kaju* A 'porridge.'

⁸ This discussion owes much to comments from Kenan Celik (personal communication).

Table 6: Newly reconstructed Class 2.4a/2.5a and Class 2.4b/2.5b nouns

		53. <i>ato</i> 2.4a 'trace'	54. <i>beni</i> 2.4a 'rouge'	55. <i>kami</i> 2.4a 'above'	56. <i>kesa</i> 2.4a 'this morning' > 'short while ago'	
		pR	*ato C	*beni C	*kami C	*kesa C
Am.	Ashikebu	?	a [†] to ^{AB}	-	-	-
	Nakasato	?	a [†] t [†] u ^C	-	-	-
	Asama	?	a [†] a [†] tu ^{AC}	-	kaa [†] mi ^C	-
	Wadomari	?	a [†] tu [†] C	-	-	†çissa ^A
	Yoron	?	atu ^C	b [†] in ^C	-	†çissa ^C
Ok.	Ie	?	a [†] t [†] u [†] AC	-	hani [†] AC	-
	Nakijin	?	a [†] t [†] h [†] oo ^C	b [†] in ^C	-	†k [†] is [†] sa ^C
	Shuri	?	at [†] u ^B	bi [†] BC	-	kissa ^{BC}
Mi.	Tarama	a [†] tu ^C -mai	bi [†] ni ^C -mai	ka [†] mi ^C -mai	ki [†] ea ^C -mai	
	Ikema	at [†] u ^C -kara [†] -mai	-	-	-	
Yo.	Yonaguni	a [†] t [†] u ^C	be [†] ni ^C	†kan [†] C	-	-
		57. <i>kuda</i> 2.4a 'tube'	58. <i>nani</i> 2.4a 'what'	59. <i>tubu</i> 2.4a 'grain'	60. <i>tumi</i> 2.4a 'sin'	
		pR	*kuda C	*nau C	*tubu C	*tumi C
Am.	Ashikebu	?	k [†] u [†] da ^C	†nu [†] u ^C	†t [†] †bu ^C	-
	Nakasato	?	k [†] u [†] da ^C	†nu [†] u ^C	t [†] u [†] bu ^{AB}	-
	Asama	?	k [†] u [†] u [†] da ^{AC}	†nuu ^{AC}	†tsibuu ^A	†ts [†] h [†] mi ^{AC}
	Wadomari	?	ku [†] da [†] C	†nu [†] u ^C	-	-
	Yoron	?	ku [†] da ^B	nuu ^A	-	†tei [†] C
Ok.	Ie	-		nu [†] u ^B	-	sini [†] AC
	Nakijin	?	k [†] u [†] daa ^C	†nu [†] u ^C	-	†tz [†] i [†] mi ^C
	Shuri	-		nuu ^{BC}	-	-
Mi.	Tarama	-		nau ^C -mai	-	tsi [†] mi ^C -mai
	Ikema	-		nau ^C -kara [†] -mai	tsibu ^C -kara [†] -mai	-
Yo.	Yonaguni	n [†] da [†] C		†nuu [†] C	-	-
		61. <i>tuti</i> 2.4a 'hammer'	62. <i>ware</i> 2.4a 'I'	63. <i>fada</i> 2.4b 'skin'	64. <i>keta</i> 2.4b 'rafter'	
		pR	*tuti C	*wanu C	*pada B	*keta B
Am.	Ashikebu	?	te [†] i [†] te [†] i ^C	†wa [†] N ^C	-	ki [†] ta ^{AB}
	Nakasato	?	t [†] u [†] te [†] i ^C	†wa [†] N ^C	ha [†] da ^{AB}	-
	Asama	?	ts [†] h [†] tsi ^{AC}	wa [†] N ^{BC}	-	kita [†] a ^B
	Wadomari	?	-	wa [†] nu [†] C	-	-
	Yoron	?	teitei ^C	†wanu ^C	pa [†] da ^B	ei [†] ta ^B
Ok.	Ie	-		wan ^B	p [†] ada [†] a ^B	k [†] it [†] a [†] a ^B
	Nakijin	-		wanu [†] u ^B	p [†] ha [†] daa ^B	k [†] it [†] ha [†] a ^B
	Shuri	-		wan ^{BC}	hada ^B	kita ^{BC}
Mi.	Tarama	-		ba [†] N ^C -mai	pada ^B -ma [†] i	kita ^B -ma [†] i
	Ikema	-		ban ^C -kara [†] -mai	hada [†] B-kara-†mai	kita [†] B-kara-†mai
Yo.	Yonaguni	-		ba [†] nu [†] C	hada ^B	-

(Continued)

Table 6: *Continued*

		65. <i>nafe</i> 2.4b 'seedling'	66. <i>saja</i> 2.4b 'sheath'	67. <i>soba</i> 2.4b 'side'	68. <i>toga</i> 2.4b 'sin'	
		pR	*nae B	*saja B	*soba B	*toga B
Am.	Ashikebu		ʳn ^g ABC	-	suʳba ^{AB}	-
	Nakasato		neʳe ^{AB}	-	suʳba ^{AB}	-
	Asama		naʳi ^B	síʳi ^B	eubaʳa ^B	-
	Wadomari		-	-	-	-
	Yoron		neʳe ^B	-	-	tuʳga ^B
Ok.	Ie		neʳe ^B	síʳi ^B	subaʳa ^B	thugaʳa ^B
	Nakijin		-	eiʳi ^B	subaʳa ^B	thugaʳa ^B
	Shuri		nee ^{BC}	saja ^B	suba ^B	tuga ^B
Mi.	Tarama		nai ^B -ma ^l i	ee ^B -ma ^l i (‐A)	eubaʳ-ma ^l i	tuga ^A -mai
	Ikema		nai ^{1B} -kara-ʳmai	saja ^{1B} -kara-ʳmai	-	-
Yo.	Yonaguni		nai ^B	-	suba ^B	tunŋa ^B
		69. <i>wana</i> 2.4b 'trap'	70. <i>awi</i> 2.5b 'indigo'	71. <i>funa</i> 2.5b 'gibel'	72. <i>kimi</i> 2.5b 'millet'	
		pR	*wana B	*ai B	*puna B	*kimi B
Am.	Ashikebu		-	ʳje ^{ABC}	ʳɸuʳna ^C	-
	Nakasato		-	-	-	-
	Asama		wanaʳa ^B	ɸaʳi ^B	ɸunaʳa ^B	-
	Wadomari		-	ɸaʳi ^B	-	-
	Yoron		-	aʳi ^B	-	-
Ok.	Ie		-	ɸeʳe ^B	-	te ^h iniʳi ^B
	Nakijin		-	ɸeʳe ^B	-	-
	Shuri		-	ɸjee ^B	-	-
Mi.	Tarama		bana ^B -ma ^l i	af ^B -ma ^l i	funa ^B -ma ^l i	kim ^B -ma ^l i
	Ikema		bana ^{1B} -kara-ʳmai	ai ^{1B} -kara-ʳmai	-	tsiŋ ^{1B} -kara-ʳmai
Yo.	Yonaguni		-	ai ^B	huʳna ^{1C}	-
		73. <i>koto</i> 2.5b 'zither'	74. <i>maju</i> 2.5b 'cocoon'	75. <i>tate</i> 2.5b 'upright'		
		pR	*koto B	*maju B	*tate B	
Am.	Ashikebu		-	maʳi ^{AB}	taʳte ^{AB}	
	Nakasato		-	-	-	
	Asama		kotoʳo ^B	-	tatiʳi ^B	
	Wadomari		-	-	-	
	Yoron		-	-	taʳti ^B	
Ok.	Ie		k ^h ut'uʳu ^B	majuʳu ^B	that'íiʳi ^B	
	Nakijin		k ^h ut'uʳu ^B	majuʳu ^B	that'íiʳi ^B	
	Shuri		kutuu ^{BC}	-	tati ^{BC}	
Mi.	Tarama		kutu ^B -ma ^l i (‐A)	maju ^A -mai (‐C)	ta ^l ti ^C -mai	
	Ikema		-	-	-	
Yo.	Yonaguni		kuʳt'u ^A	maju ^B	-	

4.2 Nouns for which the pR class was newly reconstructed (23 words)

We newly reconstructed the pR tone classes of 23 nouns (Table 6). The majority of these nouns are attested in both Northern and Southern Ryukyuan, and their tonal correspondences are highly regular, but their pR tone classes have not been reconstructed in previous studies.

56. *kesa C ‘a short while ago’: We postulate a semantic change ‘this morning’ > ‘a short while ago’ following the NKDJ’s (2001, 1321) view. The Niigata dialect of Japanese also has *kesa* ‘a short while ago’ (Ohashi 2003, 90), suggesting that this type of semantic change is natural. Northern Ryukyuan forms exhibit an unexpected geminate, which requires further research.

58. *nau C ‘what’: For the reconstruction of *nau, not *nao, see Jarosz (2019).

59. *tubu C ‘grain’: Widespread Ryukyuan nouns for ‘grain’ are the reflexes of pR *tuzu C ‘grain’ (Yoron *tcizi*^C ‘id.,’ Ie *sidzi*^{AC} ‘id.,’ Ishigaki *tsidzi*^{BC} ‘id.,’ Yonaguni *tc’in*^C). Evidence for *tubu ‘grain’ is sparse in the primary data, but in the secondary data, we find Yamatohama *tz’ibu* ‘grain,’ Taketomi *subu* ‘id.,’ and Ishigaki *subu*^{BC} ‘grain.’ Tarama *tsiv*^C ‘dew’ discussed in Section 4.1 may at first glance seem to be a reflex of pR *tubu C ‘grain’; the difference in meaning between ‘grain’ and ‘dew’ appears to be the result of a contamination with pR *tuju C ‘dew.’ However, evidence shows that, although pR *bu is spirantized into *v(u)* in many environments in varieties of Miyako, including Tarama (cf. pR *kobu C ‘spider’ > Tarama *kuvu*^C ‘id.,’ pR *abura B ‘oil’ > Tarama *avva*^B ‘id.’), the spirantization does not occur when *bu is preceded by *tu. For example, in pR *tubusi A ‘knee’ (Yoron *tcinci*^A ‘id.,’ Nakijin *tz’inci*^A ‘id.,’ Ishigaki *tsibusi*^A ‘id.’) and pR *tuburu C ‘head, calabash’ (Yoron *tciburu*^C ‘head,’ Nakijin *tz’imbu*^C ‘id.,’ Ishigaki *tsiburi*^{BC} ‘id.’), *bu is not spirantized in Tarama as in *tsibusi*^A ‘knee’ and *tsibul*^C ‘calabash.’ In other varieties of Miyako, *bu in these nouns is reflected as *gu* (Irabu *tsigusi* ‘knee,’ *tsigvi* ‘calabash’; Ikema *sigust*^A ‘knee,’ *tsigui*^C ‘calabash’) (Celik 2020), likely through sporadic change⁹. Therefore, Tarama *tsiv*^C ‘dew’ is not a reflex of pR *tubu C ‘grain.’ This evidence also indicates that Ikema *tubu*^C ‘grain’ is a regular reflex of pR *tubu C ‘id.’

61. *tuti C ‘hammer’: In the primary data, its reflexes are only attested in four dialects of North Ryukyuan, but in the secondary data, they are also attested in Southern Ryukyuan (Ishigaki *tsitsi*^{BC} ‘hammer’). Therefore, it is safe to assume that this noun exists in pR.

71. *puna B ‘gibel’: As far as the data in Table 6 are concerned, the principle of parsimony cannot determine whether the tone class of pR *puna ‘gibel’ is B or C. The cognates of pR *puna are infrequent in Ryukyuan dialects. However, in Uwano (1998) study on many varieties in Okinoerabu Island, 24 of the 35 varieties have the cognates of pR *puna, and in all but one of the 24 varieties, the pitch pattern corresponds to Class B. Based on this, we reconstruct pR *puna B ‘gibel.’ The segmental correspondence in the first syllable in Yonaguni *huna* is irregular (compare pR *puna ‘gibel’ with pR *pune C ‘boat’ [Yonaguni *nni*^C, Yoron *puni*^C, Shuri *ɸyni*^B] and with pR *pugori A ‘testicles’ [Yonaguni *ŋgui*^A, Yoron *pugui*^A, Shuri *ɸugui*^A]). It is therefore possible that borrowing is involved in this noun for Yonaguni. If Yonaguni *huna*^C corresponding to Class C is a loanword, then the view that the tone class of pR *puna ‘gibel’ is B becomes more plausible.

73. *koto B ‘zither’: The segmental correspondences are irregular, suggesting that borrowing is involved. The correspondence between MJ and Southern Ryukyuan suggests that the first syllable in pR is *ko. Although pR *ko reflects as *ɸu* in Ie and Nakijin, the first syllable in ‘zither’ is *kʰu* in both dialects. The Shuri form has an unexpected long vowel in the second syllable. The Asama form has an unexpected vowel *o*, and the speaker is aware that this is a new word (Uwano 2017a, 152). However, the regularity of tonal correspondence (except Yonaguni) and the widespread attestation make us hesitant to deny the existence of this noun in pR.

74. *majo B ‘cocoon’: It is more difficult to determine whether the final syllable of ‘eyebrow’ is *ju or *jo than in the case of pR *majo B ‘eyebrow.’ Ashikebu distinguishes between *majo*^{AB} ‘eyebrow’ and *mai*^{AB} ‘cocoon’ and the final vowel of the latter agrees with that of *kai*^{AB} ‘porridge’ (< pR *kaju A ‘id.’); therefore, pR *maju ‘eyebrow’ is favored. However, Taketomi, which does not distinguish *maju*^{BC} ‘eyebrow’ and *maju*^{BC}

⁹ Pellard (2009a, 283) argues that the change *b > g in *tubusi ‘knee’ is an irregular change that defines a subgroup called Common Miyako consisting of all the Miyako varieties but Tarama. In contrast, Celik (2020, 37) discovered that the change *b > g is also observed in pR *tuburu C ‘head, calabash’ and suggests that this change may be a regular change with a very limited application environment. There are two other cognates that have a virtually identical environment: *tubus- ‘crushed’ and *tubure- ‘get crushed’ (Tarama *tsibus*- ‘crush,’ *tsiburi*- ‘get crushed’; Irabu *tsibus*- ‘crush,’ *tsiburi*- ‘get crushed’). The fact that *b does not change into g in these verbs may suggest that the change *b > g is sporadic, although there remains the possibility that *tubus- and *tubure- are loanwords given that their reflexes are scarcely found in Ryukyuan.

‘cocoon,’ has *kəi*^A ‘porridge’ with a different vowel from that in ‘eyebrow’ and ‘cocoon,’ supporting pR *majo B ‘cocoon.’ Although the conflicting sound correspondences are difficult to interpret, we reconstruct pR *majo B ‘cocoon’ first, because both ‘eyebrow’ and ‘cocoon’ are *majo*₁ in OJ, and second, because there is a theory (Martin 1987, 474) that views these two nouns as cognates.

4.3 Class 2.4–2.5 nouns whose pR classes remain unsettled

The pR tone classes of the 17 nouns shown in Table 7 remain unsettled primarily because of irregular correspondences between Ryukyuan dialects or between pR and MJ.

76. *itu A? ‘when,’ 77. *sumi A? ‘inside corner,’ 78. *abo A? ‘horsefly,’ 79. *aki A? ‘autumn,’ 80. *pabu A? ‘snake,’ 81. *turo A? ‘crane’: The comparison of Ryukyuan dialects suggests that the tone class of these six nouns is Class A, which is an irregular reflex of MJ Class 2.4–2.5. At least for some of them, the irregularity may be explained by borrowing. However, the relatively regular tonal correspondences between dialects suggest that the borrowing, if any, occurred at the stage of pR. We leave open the issue regarding the irregularity and the reconstruction of tone classes of these nouns.

For *pabu A ‘snake,’ there is an additional issue about its cognacy. The irregularity of correspondence between MJ *femi* 2.5 ‘snake’ and pR *pabu A occurs not only in tones but also in segments. Furthermore, the cognates of pR *pabu A usually refer to a venomous snake endemic to the Ryukyu Islands, rather than to snakes in general; thus, the meanings do not exactly correspond. Therefore, instead of the view that pR *pabu A is related to MJ *femi* 2.5 ‘snake’ (e.g., Jarosz et al. [2022]), we should explore the possibility that pR *pabu A is related to MJ *fami* ‘viper.’ Cognates that may be related to MJ *fami* ‘viper’ are widely distributed in Kansai, Chugoku, and Shikoku Districts in the forms of *hami*, *hame*, *hamu*, *habi*, *habe*, *habu*, and so forth, all of which mean ‘viper’ (LAJ 1966–1974, Map 228). Crucially, the pitch pattern of MJ *fami* ‘viper’ is HL, a regular reflex of Class 2.2, which in turn regularly corresponds to pR Class A. Meanwhile, Wadomari and Shuri have nouns referring to ‘snake’ in general, namely, *çibu*^C and *phiibu*^C, respectively. Although evidence is sparse, it may be possible to reconstruct pR *pebu C ‘snake’ along with pR *pabu A ‘venomous snake.’ If this holds true, then it is pR *pebu C ‘snake’ that is related to MJ *femi* ‘snake,’ and its tonal subclass is Class 2.5a.

82. *aka A? ‘red,’ 83. *ao B? ‘blue,’ 84. *kuro B? ‘black,’ 85. *siro B? ‘white’: These four words are color terms, which do not appear as free nominal morphemes in Ryukyuan but are adjectives that appear with a following component. In Table 7, the adjectives followed by a noun for ‘color’ (a reflex of pR *ero B ‘color’ [Pellard 2013]) are represented. *aka ‘red’ seems to belong to pR Class A, whereas the others seem to belong to pR Class B. However, these classes are those of adjectives, not nouns. Adjectives may have different tone systems than nouns, and the pR tone system of adjectives has been little investigated. We therefore do not reconstruct the tone class of these color terms.

86. *kazu B~C ‘number’: Although de Boer (2010) reconstructs Class C, half of the dialects in our data exhibit pitch patterns corresponding with Class B.

90. *gaki?? ‘oyster’: Hattori (1979a,b) regards pR as having a cognate whose tone class is Class B based on five Northern Ryukyuan dialects: Asama *gatsiitsi*^C ‘oyster?’, Nakijin *gatzii*^B ‘oyster’ (*gatz’ii*^B, Nakasone 1983), Kushi *gakii*^{BC} ‘id.,’ Onna *gaatci*^B ‘id.,’ and Shuri *gatcitcaa*^{BC} ‘sea urchin.’ However, the meaning of Asama *gatsiitsi*^C is not ‘oyster’ but ‘urchin’ according to Uwano (2017a, 157), and the meaning of Shuri *gatcitcaa*^{BC} is, as Hattori (1979a,b) also noticed, ‘urchin.’ In terms of segmental correspondence, too, these two nouns appear unrelated to MJ *kaki* 2.5 ‘oyster.’ The dialects listed in Hattori (1979a,b) that include the nouns straightforwardly related to MJ *kaki* are Nakijin, Kushi, and Onna. Yamatohama also has *gaki* ‘oyster.’ Therefore, it is possible to reconstruct pR *gaki B ‘oyster,’ although its reflexes are observed only in Northern Ryukyuan.

However, if we follow Hattori’s theory that ‘oyster’ and ‘urchin’ are related, it is necessary to compare the nouns for ‘urchin’ between dialects. They have various reflexes, such as Asama *gatsiitsi*^C, Ie *gasisi*^{AC}, Nakijin *gaciici*^C, Shuri *gatcitcaa*^{BC}, Tarama *kadzitsi*^C, Ikema *kazitsi*^C, Ishigaki *kakidzi*^{BC}, and Taketomi

Table 7: Class 2.4–2.5 nouns for which pR tone classes remain unsettled. Ha79, Hattori (1979a,b), Ma09, Matsumori (2009), Bo10, de Boer (2010)

		76. <i>itu</i> 2.4 'when'	77. <i>sumi</i> 2.4 'inside corner'	78. <i>abu</i> 2.5 'horsefly'	79. <i>aki</i> 2.5 'autumn'	
		pR	* <i>itu A?</i>	* <i>sumi A?</i>	* <i>abo A?</i>	* <i>aki? A?</i>
Am.	Ashikebu		ʔi ¹ t ¹ i ¹ ^{AB}	s ¹ i ¹ N ^{AB}	ʔa ¹ bu ¹ ^{AB}	ʔa ¹ k ¹ i ¹ ^{AB}
	Nakasato		ʔi ¹ t ¹ u ¹ ^{AB}	-	-	-
	Asama		ʔi ¹ ts ¹ i ¹ ^A	t ¹ simii ¹ ^A	t ¹ tabuu ¹ ^A	t ¹ ʔaa ¹ ki ¹ ^{AC}
	Wadomari		-	-	-	-
	Yoron		t ¹ itei ¹ ^C	ɛi ¹ N ^A	abu ¹ ^A	-
Ok.	Ie		ʔi ¹ ts ¹ i ¹ ^{AC}	sini ¹ ¹ ^{AC}	-	ʔate ¹ i ¹ ^{AC}
	Nakijin		hi ¹ tz ¹ i ¹ ^A	ɛi ¹ mii ¹ ^A	ʔa ¹ buu ¹ ^A	-
	Shuri		ʔi ¹ tei ¹ ^A	si ¹ mi ¹ ^A	-	ʔa ¹ tei ¹ ^A
Mi.	Tarama		itsi ¹ ^A -mai	-	abu ¹ ^A -mai	a ¹ ki ¹ ^C -mai
	Ikema		itsi ¹ ^A -kara-mai	-	abu ¹ ^B -kara- ¹ mai	aki ¹ ^A -kara-mai
Yo.	Yonaguni		itei ¹ ^C	-	-	-
		80. <i>femi</i> 2.5 'snake'	81. <i>turu</i> 2.5 'crane'	82. <i>aka</i> 2.5 'red'	83. <i>awo</i> 2.5 'blue'	
		pR	* <i>pabu A?</i>	* <i>turu A?</i>	* <i>aka A?</i>	* <i>ao B?</i>
Am.	Ashikebu		-	t ¹ i ¹ ru ¹ ^{AB}	-	-
	Nakasato		-	-	-	-
	Asama		-	t ¹ tei ¹ ruu ¹ ^A	t ¹ haa ¹ ʔi ¹ ruu ¹ ^A	ao ¹ i ¹ ruu ¹ ^{B?}
	Wadomari		ha ¹ bu ¹ ^{AB}	-	-	-
	Yoron		-	tei ¹ ru ¹ ^A	aa ¹ iru ¹ ^C	oo ¹ iru ¹ ^C
Ok.	Ie		p ^h abu ¹ ^{AC}	-	ʔaha ¹ i ¹ ru ¹ ^{AC}	ʔoo ¹ iru ¹ ^B
	Nakijin		p ^h a ¹ buu ¹ ^A	tz ¹ i ¹ ruu ¹ ^A	t ¹ haa ¹ ʔi ¹ ruu ¹ ^A	t ¹ ʔoo ¹ ʔi ¹ ruu ¹ ^A
	Shuri		ha ¹ bu ¹ ^A	tei ¹ ru ¹ ^A	ʔaka ¹ ʔi ¹ ruu ¹ ^A	-
Mi.	Tarama		pau ¹ ^A -mai	tsi ¹ ru ¹ ^A -mai	aka ¹ ^A -iru	au ¹ ^B -i ¹ ru
	Ikema		hau ¹ ^B -kara- ¹ mai	tsi ¹ ru ¹ ^B -kara- ¹ mai	aka ¹ ^A -iru-mai	au ¹ ^B -iru- ¹ mai
Yo.	Yonaguni		-	-	agairu ¹ ^C	-
Notes		Ma09 A				
		84. <i>kuro</i> 2.5 'black'	85. <i>siro</i> 2.5 'white'	86. <i>kazu</i> 2.4 'number'	87. <i>kudu</i> 2.4 'trash'	
		pR	* <i>kuro B?</i>	* <i>siro B?</i>	* <i>kazu B-C</i>	* <i>kudu B-C</i>
Am.	Ashikebu		-	-	-	-
	Nakasato		-	-	t ¹ ka ¹ du ¹ ^C	-
	Asama		k'uru ¹ ʔi ¹ ruu ¹ ^{B?}	s ¹ ru ¹ ʔi ¹ ruu ¹ ^{B?}	-	-
	Wadomari		-	-	-	-
	Yoron		-	-	t ¹ hazi ¹ ^C	t ¹ kuzi ¹ ^C
Ok.	Ie		-	-	hadzi ¹ i ¹ ^B	-
	Nakijin		k'uru ¹ ʔi ¹ ruu ¹ ^B	ɛi ¹ ru ¹ ʔi ¹ ruu ¹ ^{C?}	-	-
	Shuri		-	-	kadzi ¹ ^B	-
Mi.	Tarama		-	ssu ¹ ^B -i ¹ ru	ka ¹ dzi ¹ ^C -mai	-
	Ikema		ffu ¹ ^B -iru- ¹ mai	ssu ¹ ^B -iru- ¹ mai	kazi ¹ ^C -kara ¹ -mai	-
Yo.	Yonaguni		-	-	kadi ¹ ^B	k'uN ¹ ^B
Notes		Bo10 C				

(Continued)

Table 7: *Continued*

		88. <i>faru</i> 2.5 'spring'	89. <i>firu</i> 2.5 'leech'	90. <i>kaki</i> 2.5 'oyster'	91. <i>kofi</i> 2.5 'carp'
	pR	*paro A~C	*piru B~C?	*gaki? ?	*koi? ?
Am.	Ashikebu	ha ¹ ru ^{AB}	bi ¹ ru ^C	-	-
	Nakasato	-	-	-	-
	Asama	haa ¹ ru ^C	bi ¹ ru ^C	-	<u>ko¹ri^{BC}</u>
	Wadomari	-	-	-	-
	Yoron	-	piru ^C	-	-
Ok.	Ie	p ^h aru ^{1AC}	-	-	-
	Nakijin	-	-	gatz'i ¹ i ^B	-
	Shuri	haru ^B	-	-	-
Mi.	Tarama	pa ¹ ru ^C -mai	-	-	ku ¹ i ^C -mai
	Ikema	haru ^{1A} -kara-mai	hi ¹ B-kara- ¹ mai	-	-
Yo.	Yonaguni	-	-	-	-
Note		Ha79 B			
		92. <i>tune</i> 2.5 'longstanding'	93. <i>asa</i> 2.5 'morning'		
	pR	*tune B~C	*asa- ?		
Am.	Ashikebu	-	-		
	Nakasato	-	-		
	Asama	-	-		
	Wadomari	-	-		
	Yoron	-	asa-		
Ok.	Ie	-	asa-		
	Nakijin	tz'i ¹ ni ^C	hasaa-		
	Shuri	tei ¹ i ^B	?asa-		
Mi.	Tarama	-	aca-		
	Ikema	-	-		
Yo.	Yonaguni	-	-		

kəkitəi. Their tonal correspondences are perfectly regular, which allows us to reconstruct them as belonging to Class C. Irregular segmental correspondences make it difficult to reconstruct the proto-form. Assuming that variation in voicing across dialects is due to a sporadic voicing of original voiceless consonants, the proto-forms can be reconstructed as *kakisu, *kakiti, *kakesu, *kaketi, *kasesu, *kaseti, and so forth. If the proto-form for “urchin” were *kasesu or *kaseti, then it would be related not with MJ *kaki* ‘oyster’ but with MJ *kase* ‘urchin.’ By contrast, if the proto-form were *kakiti or *kakisu, then hypothetical relatedness between ‘oyster’ and ‘urchin’ becomes more plausible. In fact, Ashikebu has *gak'isi^B* ‘oyster’ (not ‘urchin’!), which corresponds to *kakisu. The Ashikebu form would provide a support for Hattori's (1979a,b) theory that the nouns for ‘oyster’ and ‘urchin’ are related. Noteworthy is that the pR tone class of ‘urchin’ is reconstructed as Class C based on the regular tonal correspondence between many dialects, whereas we reconstructed Class B for *gaki ‘oyster’ based on limited data of Northern Ryukyuan. If we focus on the limited distribution of *gaki, we can regard it as a loanword at later stage and reconstruct pR *kaki(-su) ‘oyster,’ whose tone class is C. The history of the pR noun for ‘oyster’ is complicated, which forces us to reserve judgment as to whether its tone class is B or C.

91. *koi?? ‘carp’: Only two dialects had a reflex of this noun in our primary data. Asama *koi* is irregular, as the dialect experienced a change from pR *ko to *ku* in word-initial position. In addition, it is a neologism according to the source. Irabu and Taketomi have *koi* and *kui*, respectively, although information about pitch patterns is not available. Nakijin and Shuri have polymorphemic forms, *k^huu¹juu^B* and *kuu¹i^{ju}^{BC}*, respectively. The second components must be a reflex of pR *io A ‘fish,’ although it is not clear whether the first component is related to MJ *kofi* 2.5 ‘carp.’ It is especially doubtful for Nakijin, where pR *ko changes into *ɸu* in a word-

initial position. By contrast, Ishigaki has a more transparent form *kuiʔidzu*^{BC}? A relatively reliable datum for identifying the pR tone class of *koi is Tarama *kut*^C; however, only one reflex is insufficient for reconstructing the tone class.

93. *asa-? ‘morning’: Although the presence of *asa ‘morning’ in pR has been doubted (Vovin 2008, 2010), as Pellard (2017) argues, *asa- is considered to exist in pR because the cognates of MJ *asa* 2.5 ‘morning’ are observed in many compounds in both Northern and Southern Ryukyuan. The compounds containing pR *asa- include Yamatohama *?asa-duri* ‘morning calm’ and *?asa-tz’iju* ‘morning dew’; Yoron *asa-eu* ‘morning tide’; Ie *?asa-duri* ‘morning calm,’ *asa-eu* ‘morning tide,’ and *asa-tida* ‘morning sun’; Nakijin *hasaa-durii* ‘morning calm’ and *hasaa-tz’iju* ‘morning dew’; Shuri *?asa-duri* ‘morning calm’ and *asa-tsiju* ‘morning dew’; Tarama *aca-duri* ‘morning calm,’ *aca-tsiv* ‘morning dew,’ and *aca-eu* ‘morning tide’; Hatoma *?asa-duri* ‘morning calm,’ *?asa-pana* ‘early morning,’ and *?asa-kai* ‘morning porridge’; and Ishigaki *?asa-duri* ‘morning calm’ and *?asa-kai* ‘morning porridge.’ It is unclear whether pR had a free morpheme *asa ‘morning’ because its reflexes are rarely, or not at all, used in isolation. Because the method of determining the tone class of the constituents of a compound is only established for a limited number of dialects, we do not reconstruct the tone class of the bound morpheme *asa- ‘morning.’

4.4 Class 2.4–2.5 nouns whose existence in pR is doubtful

A total of 15 MJ Class 2.4 nouns shown in Table 8 have not been reconstructed for pR, because their existence in pR is strongly doubted.

Table 8: MJ Class 2.4–2.5 nouns that may not exist in pR

94. <i>ama</i> 2.4 “nun”	95. <i>geta</i> 2.4 “clogs”	96. <i>iti</i> 2.4 “market”	97. <i>kai</i> 2.4 “oar”
98. <i>kine</i> 2.4 “pestle”	99. <i>kiri</i> 2.4 “awl”	100. <i>titi</i> 2.4 “milk”	101. <i>titi</i> 2.4 “father”
102. <i>tuba</i> 2.4 “sword guard”	103. <i>tuwe</i> 2.4 “cane”	104. <i>aju</i> 2.5 “sweet fish”	105. <i>ani</i> 2.5 “brother”
106. <i>famo</i> 2.5 “sea eel”	107. <i>sake</i> 2.5 “salmon”	108. <i>wido</i> 2.5 “well”	

95. *geta* 2.4 ‘clogs’: Although we find Yamatohama *gʒtʰa* ‘clogs’ and Shuri *dzita*^B ‘id.,’ they must be borrowings. First, the segmental correspondence between Shuri and MJ is irregular. Second, the two dialects also have synonymous *?acidza* ‘clogs’ and *?acidza*^{BC} ‘id.,’ respectively. They are reflexes of pR *asida B~C ‘id.,’ whose reflexes are widely observed in Ryukyuan dialects.

96. *iti* 2.4 ‘market’: We observe only Yamatohama *itz’i* ‘market.’ The limited attestation suggests that it is a Japanese loan.

97. *kai* 2.4 ‘oar’: Only Shuri has a form, *kee*^{BC} ‘oar,’ that may be related to MJ *kai* 2.4 ‘oar.’ However, Shuri also has a synonymous *?jeeku*^C ‘oar,’ which is a reflex of pR *ijako B~C ‘oar.’ The reflexes of *ijako are observed throughout Ryukyu Islands (Yoron *jahu*^B, Ie *?jaafu*^{AC}, Nakijin *jaɸuu*^B, Tarama *izaku*^C, Ikema *zzaku*^B, Yonaguni *daŋŋu*^B). Shuri *kee*^{BC} ‘oar’ can therefore be regarded as a borrowing.

99. *kiri* 2.4 ‘awl’: We observe Yoron *it*^B ‘awl,’ Nakijin *?iri*^B ‘id.,’ Tarama *il*^B ‘id.,’ Yonaguni *iri*^B ‘id.,’ and so forth, which allow the reconstruction of pR *iri B ‘awl.’ Although pR *iri B ‘awl’ at first glance seems related to MJ *kiri* 2.4 ‘id.,’ the resemblance must be superficial. Based on Igarashi (2021), we assume that pR *iri B ‘awl’ is instead related to a verb *igir-* ‘to make a hole with an awl’ observed in modern Japanese dialects spoken in Kyushu. Igarashi’s (2021) hypothesis is motivated by a geographical distribution of various nouns for ‘awl’ in Kyushu. Japanese dialects spoken in Kagoshima and Miyazaki Prefectures have reflexes of *iri, not *kiri (NHDJ 1989, 195, Hashiguchi 2004, 138–39, 211). In addition, reflexes of *igiri ‘awl’ are observed in dialects spoken in Izumi and Akune, the northernmost cities in Kagoshima Prefecture, as well as dialects in Kumamoto and Nagasaki Prefectures, located north of Kagoshima Prefecture (NHDJ 1989, 155, Hashiguchi 2004, 148). Because *iri and *igiri complement one another geographically and their

meanings coincide, they must be cognate. The former must have developed from the latter though an irregular sound change that drops the intervocalic *g. Notably, a verb *igir-* ‘to make a hole with an awl’ is attested in dialects spoken in Kumamoto, Nagasaki, Saga, and Fukuoka Prefectures (NHDJ 1989, 155). This region completely covers the places where reflexes of *igiri are attested, suggesting that *igiri is a gerund of a verb *igir-. These observations lead us to assume that pR*iri is related to *iri, *igiri, and *igir-, but not to MJ *kiri* ‘awl.’ The irregular dropping of the intervocalic *g in *igiri is considered as a shared innovation between Ryukyuan and Japanese dialects in south Kyushu.

100. *titi* 2.4 ‘milk’: Yoron *tciitcii*^C ‘milk,’ Nakijin *tz'iitz'ii*^C, and Shuri *tciitcii*^{BC} seems related to *titi* 2.4 ‘milk.’ However, they all are nursery words. The pR form for ‘milk’ is *tii B (cf. Ie *tc'ii*^B, Nakijin *tz'ii*^B, Shuri *tciitcii*^B, Tarama *tsii*^B, Ikema *tsii*^B). The three nursery words must be a reduplication of pR *tii B ‘milk’ that developed independently in each dialect.

102. *tuba* 2.4 ‘sword guard’: We observe only one attestation in Yamatohama *tz'iba* ‘sword guard,’ which can be considered a borrowing.

103. *tuwe* 2.4 ‘cane’: We find Tarama *diit*^A ‘handle’ and Ikema *diit*^C ‘id.’ that seem related to MJ *tuwe* 2.4 ‘cane.’ However, such apparently cognate nouns are attested only in Miyako, and their segmental correspondence with MJ is irregular. Moreover, the unexplained semantic change ‘cane’ > ‘handle’ (or ‘handle’ > ‘cane’) makes the hypothetical cognacy doubtful.

107. *sake* 2.5 ‘salmon’: We only observe Yamatohama *sak^h3* ‘salmon,’ which is considered a Japanese loan.

The other nouns listed in Table 8 have not been attested in our sources.

5 Discussion

Our survey reconstructed the pR tone classes of a total of 75 Class 2.4–2.5 nouns. They are roughly split in half between Class C (i.e., Class 2.4a/2.5a; 36 nouns) and Class B (i.e., Class 2.4b/2.5b; 39 nouns). The tonal correspondence between Ryukyuan dialects is generally regular, confirming that the split correspondence is genuine.

Now that our survey has expanded the inventory of pR tone classes by 20 words, we can test the hypothesis that the split correspondence is due to a conditioned merger (Kindaichi 1960, Hirayama et al. 1966, Tokugawa 1990) based on a larger range of data. The conditioned merger hypothesis states that Class 2.4–2.5 nouns ending in a non-high vowel were tonally merged into Class 2.3 (corresponding to pR Class B), whereas those ending in a high vowel remained as a distinct class (i.e., pR Class C). Table 9 provides a contingency table that shows the cross tabulation of pR Class with word-final vowel (non-high vs high) in Class 2.4–2.5 nouns. Table 10 shows which nouns belong to each cell of Table 9, with a distinction between Classes 2.4 and 2.5. Nouns that contradict the predictions of the conditioned merger hypothesis are shaded.

Although there is a strong tendency for nouns with a word-final high vowel not to belong to 2.4b/2.5b (Class B), 10 of the 31 nouns go against this tendency. The tendency for nouns with a final non-high vowel not to belong to 2.4a/2.5a (Class C) is slightly weaker; 15 of the 44 nouns do not obey this tendency. Therefore, the conditioned merger hypothesis has also not been supported by this study. The absence of clear conditioning factors causing the split correspondence between MJ and pR requires reconstructing more contrasts for pJ.

Table 9: The cross tabulation of pR Class with word-final vowel (non-high vs high) in Class 2.4–2.5 nouns

	Non-high-vowel ending	High-vowel-ending	Total
Class C	15	21	36
Class B	29	10	39
Total	44	31	75

Table 10: Classification of Class 2.4–2.5 nouns according to their tone classes in pR and word-final vowels

pR Class	Subclass	Non-high-vowel-ending	High-vowel-ending
C	2.4a	* ato ‘trace’, * ito ‘thread’, * jado ‘shelter’, * kesa ‘short while ago’, * kuda ‘tube’, * naka ‘middle’, * pera ‘spatula’, * pune ‘boat’, * sora ‘treetop’	* beni ‘rouge’, * iki ‘breath’, * kami ‘above’, * keu ‘today’, * matu ‘pine’, * nau ‘what’, * nusi ‘owner’, * obi ‘belt’, * omi ‘sea’, * Usu ‘mortar’, * pari ‘needle’, * pasi ‘chopstick’, * suzi ‘sinew’, * tubu ‘grain’, * tumi ‘sin’, * tuti ‘hammer’, * wanu ‘I’
	2.5a	* kage ‘shadow’, * koe ‘voice’, * mae ‘front’, * moko ‘bridegroom’, * nabe ‘pot’, * woke ‘bucket’	* kobu ‘spider’, * saru ‘monkey’, * tabi ‘socks’, * tuju ‘dew’
B	2.4b	* awa ‘millet’, * ine ‘rice plant’, * ita ‘board’, * kado ‘corner’, * kama ‘sickle’, * kasa ‘umbrella’, * kata ‘shoulder’, * keta ‘rafter’, * mino ‘raincoat’, * miso ‘bean paste’, * nae seedling, * pada ‘skin’, * poka ‘outside’, * saja sheath, * soba ‘side’, * soto ‘outside’, * tane ‘seed’, * toga ‘sin’, * wana ‘trap’, * wara ‘straw’	* kasu ‘dregs’, * kinu ‘garment’, * mogi ‘barley’, * nomi ‘chisel’, * ori ‘melon’, * siru ‘soup’, * zeni ‘money’
	2.5b	* ame ‘rain’, * ase ‘sweat’, * koto ‘zither’, * mado ‘spare time’, * majo ‘cocoon’, * majo ‘eyebrow’, * momo ‘thigh’, * puna ‘gibel’, * tate ‘upright’	* ai ‘indigo’, * kimi ‘millet’
	2.4b~2.5b		* joru ‘night’

However, although the conditioned merger hypothesis is not tenable in its original formulation, it is also true that the skewed distribution in Table 9 strongly suggests a conditioned merger. Indeed, the association between the word-final vowel (non-high vs high) and the tone classes is statistically significant according to Pearson’s chi-square test with Yates’ continuity correction ($\chi^2(1) = 6.9578, p < 0.01$), although the strength of the association is moderate (Cramer’s $V = 0.3317$ (95% CI [0.1132, 0.5195]). Observing the results of an analysis similar to that of this subsection (based on 42–43 nouns), de Boer (2010, 232) maintains that “[i]t is therefore not impossible that the presence of a close vowel in the second syllable played some role in preventing the merger of members of class 2.4/5 with class 2.3.” On the one hand, it seems premature to reject the conditioned merger hypothesis completely, but on the other hand, to defend the hypothesis, we need to revise it so that it can account for exceptions. One solution would be to assume that another factor besides word-final high vowel prevented the merger. However, such assumption is merely speculative without further investigation. At the moment, the distinction between Class 2.4a/2.5a and Class 2.4b/2.5b must be seen as tracing back to pJ.

6 Conclusion

Although it is generally accepted that MJ Class 2.4–2.5 exhibits a split correspondence with pR tone classes, the exact membership of pR tone classes has not been fully elucidated. Based on the comparison of a larger range of data of both Northern and Southern Ryukyuan, this study reconstructed the pR tone classes of 75 Class 2.4–2.5 nouns. Class 2.4–2.5 nouns were roughly split in half between pR Class C and Class B. The tonal correspondence between Ryukyuan dialects was generally regular, confirming that the split correspondence was genuine, not merely a sporadic irregularity. A hypothesis that the split correspondence is due to a conditioned merger was also examined, and no reliable conditioning factors accounting for the split correspondence were observed, even based on a wider range of data. Therefore, unless future research

would identify the factors causing the split, we must regard the distinction between 2.4a/2.5a and 2.4b/2.5b as an archaic feature tracing back to pJ, which requires reconstructing additional contrasts for pJ. The results of this study will advance a more thorough investigation into the reconstruction of the pR and pJ tone systems.

Abbreviations

Am	Amami
Bo10	de Boer (2010)
Ha79	Hattori (1979a,b)
Ma09	Matsumori (2009)
Ma12	Matsumori (2012)
Mi	Miyako
MJ	Middle Japanese
OJ	Old Japanese
Ok	Okinawa
pJ	proto-Japonic
pR	proto-Ryukyuan
Sh07	Shimabukuro (2007)
Yo	Yonaguni

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