Jonathan Kuo and Victoria Chen

76 Onomatopoeia in Puyuma

1 Introduction

Puyuma is an endangered language indigenous to southeastern Taiwan. It constitutes a single-member primary branch of the Austronesian language family (Blust 1999) and retains significant archaic morphology reconstructable to Proto-Austronesian (Teng 2008; Blust 2013; Blust & Chen 2017). As with many other northwestern Austronesian languages, Puyuma exhibits synthetic morphosyntax and displays rich infixation and prefixation patterns, including the productive use of prefixal partial reduplication for transcategorial operations.

Despite revitalization efforts undertaken over the past two decades, Puyuma remains severely endangered: most of its fluent speakers are aged over 65 (Teng 2008). In this chapter, we lay out common word-formation strategies observed in Puyuma's onomatopoeia.

2 Position of onomatopoeia in the language system

Before entering our core discussion, an overview of Austronesian onomatopoeic vocabulary is in order. Blust's series of works (1988, 2013, 2022) has shown that nearly 23% of Austronesian monosyllabic roots are onomatopoeic, the majority of which require specific morphological processes to function as an independent word (Blust 2013: 369). Although superficially similar to phonesthemes (e.g., English *gl, fl, sn,* and *ump*) and submorphemes, onomatopoeic roots constitute a whole syllable and are thus genuine morphemes.[1]

Consistent with Blust's generalization, onomatopoeias in Puyuma do not constitute a specific word class and require specific verbalizing or nominalizing morphology to function as an independent word (see section 3.2). Although some onomatopoeias have previously been documented in Puyuma, they have not been systematically analyzed. Teng's (2008) reference grammar of Nanwang Puyuma contains a brief overview of onomatopoeic expressions, while the Puyuma–English dictionary (Cauquelin 2015) includes individual notes on onomatopoeic lexical items but does not provide a comprehensive list. Cheng, Pakawyan, and Kagi's (2017: 153–59) wordlist documents 58 sets of expressions listed as onomatopoeia, including sounds from animals, actions, and the natural environment. A comprehensive analysis of word-formation strategies observed in the language's onomatopoeia, however, remains lacking.

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1 For further details and specific discussions of onomatopoeic vocabulary in Austronesian, see Blust (1988, 2022), Geraghty (1990), Lee (2017), and Zorc (1990).

Onomatopoeias constitute an open class in Puyuma. Speakers may intuitively invent new onomatopoeias.[2] Borrowed onomatopoeias are rare: they take place only when a sound segment or suprasegmental feature used in neighboring dominant languages better represents the source sound (see section 3.1). Like in other Formosan languages such as Seediq (Lee 2017), onomatopoeias are not the only sound-symbolic phenomena attested in the language: depictive ideophones (e.g., *atratr* 'to brush off', *tingting* 'to cut hair', *tebteb* 'to chop') and expressive interjections (e.g., *iwua!* (for surprise), *ah!* (for sudden realization)) are also common.

3 Description of onomatopoeia

In the following section, we present an overview of Nanwang Puyuma's onomatopoeia. Among Puyuma's eight dialects, Nanwang is the most phonologically conservative, where Proto-Puyuma's voice stop series (/b/, /d/, /ɖ/, /g/) has not undergone fricativization (Ting 1978). An investigation of Nanwang's onomatopoeic expressions would thus allow for a finer approximation of Proto-Puyuma's onomatopoeias used prior to the lenition process. This would therefore provide a clear picture of sound symbolism in Proto-Puyuma and early Austronesian morphology, as Puyuma constitutes a morphologically conservative primary branch of Austronesian.

Except where otherwise indicated, the data presented in this chapter comes from primary fieldwork on Nanwang Puyuma. We also included existing descriptions from the Puyuma literature noted above and data from the e-archive (https://e-dictionary. ilrdf.org.tw/) held by the Taiwan government's Council of Indigenous Peoples.

3.1 Phonology

3.1.1 Vowel and consonant inventory

Nanwang Puyuma has four vowels (/i/, /u/, /a/, /ə/) and 18 consonants (/p/, /b/, /t/, /d/, /k/, /g/, /ʔ/, /m/, /n/, /ŋ/, /ʈ/, /ɖ/, /s/, /l/, /ɭ/, /r/, /w/, /j/) (Ting 1978; Teng 2008). Relatively few phonotactic constraints are observed: any vowel can occur as a nucleus, and all consonants may appear either as onset or coda (Teng 2008). All four vowels are used in

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2 One observation that reflects the productive nature of Puyuma onomatopoeias is their formal variation. For example, 'sound of clapping' has three possible forms: *patraetra, patraptrap,* or *patra'tra'.* Although speakers may have a specific form in their mental lexicon, they consider all these valid representations for clapping. Another example is 'sound of heartbeat,' which is reported with three variants: *matrektrek* (documented in our fieldwork), *matreptrep/madrekdrek* (Cheng, Pakawyan, and Kagi 2017), or *trebtreb* (Cauquelin 2015). All three forms are documented with speakers of the same dialect (Nanwang).

imitative sound symbolisms (e.g., /si**ŋ**si**ŋ**/ 'sound of bells,' /**ku**ku/ 'sound of roosters,' /təktək/ 'sound of geckos,' and /ʔa**k**ʔa**k**/ 'sound of crows'). Hereafter, we adopt Puyuma's orthographic conventions for the velar nasal (*ng*), glottal stop ('), retroflexes /ʈ/, /ɖ/ /ɭ/ (*tr*, *dr*, and *lr*, respectively), and schwa (as *e*).

As in many other languages, Puyuma makes elaborate use of the manner of articulation for onomatopoeic expressions (e.g., /**ŋ**iaw/ 'sound of cats', /**sə**ri**ŋsə**riŋ/ 'sound of rattles', /ʈe**p**u**k**/ 'sound of a fruit dropping', and /pi**w**piw/ 'sound of whistles'). Non-native sound combinations are not attested, nor do the attested onomatopoeias violate the phonotactic principles. Some onomatopoeic words, however, deviate from the language's standard phoneme inventory and utilize the sound segments available in the socioculturally dominant languages—Taiwanese Southern Min and Mandarin Chinese. For instance, /o/ is not phonemic in Puyuma but appears in [ŋ**o**] 'sound of cattle'. Aspirated /p/ is also non-phonemic in Puyuma but appears in [**p**ʰus]—'sound of silent fart.'[3]

3.1.2 Syllabic structure

Most free morphemes in Puyuma are formed by two or more syllables (most monosyllabic words are functional/grammatical morphemes). These polysyllabic words allow a maximum of two co-occurring consonants across syllable boundaries. The template for disyllabic words is therefore (C)V(C)(C)V(C) (however, no instances of VV or VCCV are attested).[4]

Puyuma's onomatopoeias generally follow these regular syllable structure patterns and can be (morphologically) classified into three types: (i) monosyllabic roots (e.g., (1a–b)), (ii) disyllabic roots/words (e.g., (1c–e)), and (iii) polysyllabic words derived via reduplication or specific verbal affixation (e.g., (2)). For the sake of clarity, the exact reduplication patterns (highlighted in boldface) are indicated as subheadings based on Adelaar's (2000) classification. The verbal morphology involved in these complex words is further discussed in section 3.2.2.

(1) *Possible syllable structures attested in Puyuma's onomatopoeia*

a.	CV	*ngo*	'sound of cattle'
b.	CVC	*beng*	'sound of a car'
c.	CVCVC	*geras*	'sound of a leaf rustling'
d.	CVVC	*ngiaw*	'sound of a cat meowing'
e.	VCV	*ungã*	'sound of crying babies'

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3 [o] is allophonic of /u/ only when preceding a velar nasal (e.g., /guŋ/ [goŋ] 'cow'; see Teng 2008: 18 for details). The sequence [ŋo] is therefore an exception to Puyuma's ordinary phonotactic constraints.
4 Due to space limitations, this statement has set aside several related questions, including syllabification and several possible combinations of medial consonant clusters (see Teng 2008 for details).

According to our survey, CVC is the most common pattern for monosyllabic onomatopoeic roots, whereas disyllabic roots typically exhibit a CVCVC pattern. Unlike English, however, Puyuma does not have onomatopoeic words that contain exclusively vowels or exclusively consonants.

(2) *Reduplication strategies attested in Puyuma's onomatopoeia*
    a. Monosyllabic root reduplication: C_1VC_2-C_1VC_2

        'op'op   'sound of a bullfrog'
        kuku   'sound of a rooster'
        besbes   'sound of wind'
        piwpiw   'sound of whistles'

    b. Monosyllabic root reduplication with *<aC>* (and *<e>*) infixation: C_1*<aC>*VC_2-C_1VC_2 or C_1*<aC>*VC_2*<e>*C_1VC_2

        *pa-**s<ar>ingsing***   'sound of a bell ringing' (used as a predicate)
        *pa-**tr<alr>angtrang*** 'sounds of an earthquake' (used as a predicate)
        *pa-**tr<al>ingtring***   'sound of a cow bell' (used as a predicate)
        *pa-**tr<ar>ik<e>trik***   'sound of fire burning' (used as a predicate)
        *pa-**g<ar>as<e>gas***   'sound of papers shuffling' (used as a predicate)
        *pa-**tr<alr>ap<e>trap*** 'sound of slippers' (used as a predicate)

    c. Disyllabic root reduplication: $C_1V_1C_2V_2$-$C_1V_1C_2V_2C_3$

        *dr**<em>erudrerung***   'sound of thunder' (used as a predicate)
        *me-**lraulraun***   'sound of a dog barking' (used as a predicate)
        *pala-**ngiangiaw***   'sound of a cat meowing' (used as a predicate)

As seen above, reduplication processes are commonly involved in Puyuma's onomatopoetic expressions. Many reduplication patterns are reported in Adelaar's generalization of common reduplication processes in western Austronesian (Adelaar 2000; for a related discussion, see also Himmelmann 2004). Among these processes, the full reduplication of a monosyllabic root (e.g., (2a)) is often used to denote sounds that are repetitive in nature and signify an inherently iterative meaning (for a discussion, see Adelaar 2000: 35). Some of these ideophones may even function as generic nouns, for example, animal names (e.g., *'ak'ak* 'crow,' *gerger* 'wasp,' and *maymay* 'duck') or tools (e.g., *kawkaw* 'sickle' and *kangkang* 'plow').

    A second common type of monosyllabic root reduplication involves the infixation of *<aC>* between the onset and the nucleus of the root (for examples where the roots function like verbal predicates, see (2b)). The consonant form of the affix *<aC>* allows three possible liquid variants: *l*, *lr*, or *r*; there seems to be no specific rule governing the choice of variant.[5] Interestingly, fossilized reduplication of this type often occurs with

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5 Teng (2008) lists one other consonantal variant, *g*, of the *<aC>* affix. To the best of our knowledge, this variant has not been attested in Puyuma's onomatopoetic expressions.

the verbal affix *pa-*, which canonically functions as a causative prefix. A linker usually appears in the infixation form, such as *<a>* or *<e>* in Puyuma or *<i>* in Siraya (Adelaar 2000: 36). Vowel insertion like the above is a common strategy for avoiding cross-syllable consonant clusters (Teng 2008: 37).[6] The third common pattern is disyllabic root reduplication, where the disyllabic root is usually fully reduplicated except for its last consonant (if any) (Adelaar 2000). This strategy is attested in Puyuma's onomatopoeic words (consider the examples in (2c) above).

3.1.3 Stress

Stress in Puyuma is unitarily syllable-final and thus non-phonemic. Onomatopoeias follow this pattern: monosyllabic ideophones are stressed by default; suprasegmental properties do not have a special role in the form of Puyuma onomatopoeias. Notably, in quotative constructions where the onomatopoeic expression precedes the verb *kema* 'say so' (e.g., *tuk-tuk-tuk* 'imitation of hammering sounds' (3a)), repetition of the onomatopoeic root does not render the entire quotative a single phonological word. Instead, each unit (e.g., *tuk* in (3a); *ungã* in (3c)) is independently stressed, as indicated in bold face. Such primary onomatopoeias are therefore not subject to regular (supra)segmental properties as addressed in Puyuma phonology; unusual features such as diphthong lengthening (3b) and vowel nasalization are (3c) attested. To what extent speakers disregard the general phonetic/phonological system to sound faithful to a source of sound is essentially their choice.

(3)   *Puyuma onomatopoeias in quotative constructions*
    a.   Independent stress
       *"**tuk-tuk-tuk**," kema* 'imitation of hammering sounds'
       (cf. *tu<a>k<e>**tuk*** 'hammer')
    b.   Lengthening
       "siw~" kema 'imitation of the sound of a car driving by'
    c.   Vowel nasalization
       "ungã-ungã," kema 'imitation of a baby crying'

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6 Teng (2008) views *<a>/<e>* infixation as a process independent of *<aC>* infixation. In these cases, she shows that the choice seems to be semantically driven. Verbal expressions with *CVC<a>CVC* normally show iterative meaning, whereas those have that schwa do not. However, this generalization does not hold in the case of onomatopoeic words.

3.1.4 Tone

As with most other western Austronesian languages, Puyuma is atonal. Tonal distinction is thus not attested Puyuma's onomatopoeic expressions.

3.2 Morphology and syntax

Primary onomatopoeias (i.e., proper sound imitations) in the language are usually morphologically simple. Many monosyllabic roots may stand alone as a free morpheme (e.g., **tuk** 'hammering sound' and **beng** 'sound of a car or airplane (engine)'). Others surface in the form of fossilized reduplication, such as **besbes** 'sound of wind' and **trengtreng** 'sound of a train.' Disyllabic roots also constitute a subclass of primary onomatopoeias. For example, **seras** 'sound of rain,' **ngiaw** 'cat vocalization,' and **beru** 'sound of big objects plumping.' Many secondary onomatopoeias are derived from onomatopoeic roots through reduplication and/or affixation of specific verbal morphology. Below, we describe the word-formation strategies observed in the derivation of morphologically complex onomatopoeic words and the syntactic distribution of Puyuma's onomatopoeic roots and words.

3.2.1 Word-formation

Having described common reduplication patterns involved in Puyuma's onomatopoeias (3.1.2), we turn now to how these lexical items function as a specific word class (part of speech) through a variety of morphological processes. As seen in (4), specific verbal affixes such as Philippine-type voice morphology (e.g., actor voice (4a), non-actor voice morphology (4b)), *<aC>* (4c), and *pa-/pala-* (4d) may change specific onomatopoeic roots into a verb, whereas the nominalization affix *-an* can transform a root into a noun (4e).

(4) *Derivation of secondary onomatopoeias*
    a. **Actor voice (AV) marking and other *M*-related verbal morphology**[7]
        me-lraun 'bark (v.),' ***me-lreslres*** 'twist (v.),' ***m-ayaayay*** 'yawn (v.),' *k<**em**>eteket* 'step (on) (v.),' *k<**em**>akap* 'climb (v.),' ***ma-treptrep*** 'have heartbeat (v.),' ***ma-ging<a>ging*** 'shake (v.),' ***mi-kalkal*** 'laugh (v.),' **mu**-kulukulung 'roll off (v.)'...

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7 The form of Puyuma's actor voice morpheme (*<em>*, *me-*, or *m-*) is phonetically conditioned and subject to the onset of the stem (Teng 2008: 26–27). Two other related morphemes are *ma-* and *mu-*. Both are analyzed as actor voice variants with further functions (stative and detransitive, respectively). For details, see Teng (2008) and Chen (2020).

b. **Nonactor voice marking**[8]
*kelekelek-**aw*** 'tickle (v.),' *suksuk-**i*** 'lock (v.),' *riterit-**an*** 'mow grass (for) (v.),'
*riterit-**u*** 'mow (grass) (v.)'. . .

c. **<*aC*> infixation**[9]
*tr<**alr**>aketrak* 'walk in wooden clogs (v.),' *b<**al**>etrbetr* 'throb (v.)'. . .

d. ***Pa-* or *pala-* prefixation**
***pa**-tr<**ar**>iketrik* 'crack (v.),' ***pa**-tr<**ar**>ietri* 'fart (v.),' ***pala**-ngingi* 'oink (v.),'
***pala**-tektek* 'produce the sound of a gecko (v.)'. . .

e. ***-an* suffixation**[10]
*g<in>utrgutr-**an*** 'the itchy part scratched,' *t<in>iktik-**an*** 'the thing carved'. . .

It is unsurprising that Philippine-type voice marking (4a–b) constitutes a major morphological device for forming onomatopoeic verbs. Example (4a) demonstrates the use of actor voice morphology (<*em*>, *me-*, and *m-*) in the derivation of onomatopoeic verbs. Patient and locative voice affixes (-*aw, -an*, and -*u*) may also create such verbs, which take a different argument-marking pattern depending on the specific voice type. However, some other onomatopoeic verbs do not take overt voice marking and instead employ <*aC*> infixation plus reduplication and *pa-* or *pala-* prefixation, as seen in (4c–d). The prefix *pa-* is a causative affix used for both productive and lexical causativization, while *pala-* is an affix attached to nominal bases and denotes 'many, a lot of, or an accumulation of.' Both affixes are commonly observed in Puyuma's onomatopoeic verbs. The original function of these affixes is usually not transparent in the onomatopoeic expression. Finally, (4e) demonstrates instances of derived patient nouns with the use of the undergoer nominalizer -*an*.

3.2.2 Syntax

The syntactic distribution of Puyuma's primary onomatopoeias is fairly free. These onomatopoeias can either stand alone as a free utterance (5a–c) or occur as a nominal (e.g., (5d)). In quotative constructions marked by the verb *kema* 'say so,' the onomatopoeia functions as a verb complement (5c). Finally, it is possible for a restricted set of primary

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8 As with many other Philippine-type Austronesian languages, Puyuma exhibits three non-actor voices: patient voice (PV), locative voice (LV), and circumstantial voice (CV). All three voices inflect for mood: indicative (-*aw/-ay/-anay*) versus non-indicative (-*u/-i/-an*).

9 Cauquelin (2015: 6) identifies Puyuma <*aC*> as an infix that denotes 'having the sound of' or 'having a certain property of.' Zeitoun and Kaybaybaw (2021) identify two similar affixes (<*ar*> and <*al*>) in Saisiyat's onomatopoeic expressions and note that they may be fossilized infixes derived from Proto-Austronesian *<aN>, which denotes a certain sound or property. See also Li and Tsuchida (2009: 350) for a similar observation of <*ar*> and <*al*> in Pazih.

10 Undergoer nominalization is commonly formed with the suffix -*an*, with or without an affixation of the perfective aspect marker <*in*> (Teng 2008: 135–136).

onomatopoeias to occur in the argument position. In (5d), for example, the root *lraun* 'sound of a dog barking' serves as an oblique of the intransitive verb *kilengaw* 'hear.'

(5)   *Primary onomatopoeias*
    a.   kebeng!
        ONOM
        (imitation of the sound of objects dropping on the ground)
    b.   "kok!   kok!   kok!"   ulaya   a   trau   i   sabak?
        ONOM   ONOM   ONOM   EXIST   NOM   person   LOC   inside
        '"Knock! Knock! Knock!" Is anybody inside?'
    c.   "seras,"   kema   na   'udal.
        ONOM   say.so   NOM   rain
        'The rain rustles.'
    d.   kilengaw=ku   dra   lraun   dra   suan.
        listen=1SG.NOM   OBL   ONOM   POSS   dog
        'I hear the barking of a dog.'

Puyuma's secondary onomatopoeias can take a wide range of verbal morphology (e.g., Philippine-type voice) to function as a predicate, as in (6a–d), or stand as a noun through nominalization morphology. In the latter case, the derived word functions as an argument in a given clause and can have possessive morphology, as in (6d).

(6)   *Secondary onomatopoeias as verbs or nouns*
    a.   *sabelraw   na   suan=la,   aw   **me-lrau-lraun**.*
        hungry   NOM   dog=PERF   and   AV-RED-ONOM
        'The dog got hungry, and it barked.'
    b.   *aremeng=la,   u-a   **suksuk-i**   na   salrikidr.*
        late=PERF   go-IRR   ONOM-LV:IMP   NOM   gate
        'It's late already. Go lock the gate.'
    c.   *batring   ku=tranguru'   b**<al>etrbetr.***
        headache   1SG.PSR=head   <aC>ONOM
        'I have a bad headache: it's throbbing.'
    d.   ***pa-trungtrung**   na   patringtringan,   aru   ka-radruk   kaigi=la.*
        CAU-ONOM   NOM   bell   will   ka-gather   meeting=PERF
        'The bell is ringing. Gather up for the meeting.'
    e.   ***tu=t<in>iktik-an**   kan   siber   idrini   na   banin.*
        3.PSR=<PFV>ONOM-NMZ   OBL   Siber   this.NOM   NOM   plank
        'This is the plank carved by Siber.'

3.3 Semantics

3.3.1 General

Onomatopoeias in Puyuma denote a wide range of semantics. The majority are directly associated with a particular kind of sound source; for example, *kuku* with roosters and *selrselr* with frying. Onomatopoeic expressions of this type include natural sounds from inanimate sources (e.g., *tu'tu'* 'sound of dripping' and *trepuk* 'sound of (a fruit) dropping'), natural sounds from animate sources, including vocalizations (*ngiaw* 'cat vocalization' and *'op'op* 'call of a bullfrog') and corporeal sounds (*kalkal* 'sound of laughter' and *patraptrap* 'sound of clapping'), as well as sounds of human artifacts (*beng* 'sound of a car' and *trektrek* 'sound of a clock ticking').

However, not all onomatopoeias are directly linked to a narrowly identifiable kind of sound source. Many onomatopoeias imitate sounds of collision, compression, or friction. For example, *setrap* imitates the sound of cars colliding, *ngeritr* imitates the sound of tearing things, and *beru/kebut* imitates the sounds produced by objects of different sizes dropping in a comparatively generic fashion. Given their adaptability, it seems that virtually any salient sound can be imitated in Puyuma.

It is noteworthy that Puyuma has a relatively rich inventory of bird calls. Some onomatopoeias reflect the vocal quality of the calls made by different species, while others are used to forecast the weather or indicate omens (Cheng, Pakawyan, and Kagi 2017). We have shown in section 3.1.2 that expressions with monosyllabic root reduplication may denote either the sounds themselves (i.e., primary onomatopoeias) or the source (e.g., entities/animals) of the sound. Instances of conversion are also attested in bird names. For example, the Taiwan bamboo partridge (*Bambusicola sonorivox*) is named after its call, *tikuras*. Notably, our survey shows no instances of imitation of fish and sea creatures. This observation aligns with the living style of the ancestors of the Puyuma people (i.e., they are a mountain tribe).

3.3.2 Semantic relations

Relatively little research has been done on semantic relations in the Formosan literature. Our preliminary survey (drawing on two Puyuma dictionaries: Cauquelin (2015) and the online dictionary of Puyuma published by the Taiwan government) showed relatively few cases of synonymy and homophony. Instead, as a morphologically complex language, Puyuma displays a rather different pattern of polysemy. As noted earlier, primary onomatopoeias in Puyuma are mostly roots that cannot stand alone as an independent word. To the best of our knowledge, these proper sound imitations rarely develop polysemy as they usually occur as isolated utterances in discourse—unlike secondary onomatopoeias, which function as predicates or arguments and therefore increase changes in metaphorical or semantic extension (namely, they occur in iso-

lation and thus do not interact with neighboring units). With derivational processes such as reduplication, verbal morphology, and nominalization, most of these forms can become secondary onomatopoeias. Example (7) illustrates two major types of semantic relations extracted from primary-secondary onomatopoeia pairs, namely (a) the sound vs. the action or movement of the subject that utters the sound and (b) the object/entity that produces the sound.

(7) Primary onomatopoeias and the derived meaning of secondary onomatopoeias
      Primary   Secondary
      drerung 'sound of thunder'   *dr<em>adrerung* 'thunder (v.)'
      gemgem 'sound of grinding one's teeth   *g<alr>emgem* 'be in a state of angriness'
      with anger'
      ringring 'sound of frying'   *pa-ringring* 'fry (v.)'
      traptrap 'sound of clapping'   *p<en>a-traptrap* 'clap (hands) (v.)'
      trektrek 'sound of clock ticking'   *ma-trektrek* 'watch (n.)'
      singsing 'sound of a bell ringing'   *singsing-an* 'rattle'
      besbes 'sound of wind'   *besbes-an* 'fan'

4 Conclusion

Puyuma, a severely endangered indigenous language of Taiwan that constitutes a single-member primary branch of the Austronesian family, displays great variation in its onomatopoeias, both in syllable structure and word-formation strategy. Primary onomatopoeias (most of which have undergone fossilized reduplication) are typically monosyllabic or disyllabic. This conclusion is in line with Blust's (1988) generalization that Proto-Austronesian exhibited a high number of monosyllabic roots that are onomatopoeic. Secondary onomatopoeias are often affixed onomatopoeic roots. Common morphological processes observed include several types of reduplication patterns, attachment of Philippine-type voice morphology, or nominalization.

Puyuma's primary onomatopoeias generally appear as free utterances, mini-clauses at the edge of a given sentence, or verb complements in a quotative construction. Secondary onomatopoeias usually carry specific word class-indicating morphology and function as a verb or a noun, just as ordinary non-onomatopoetic roots do. Puyuma onomatopoeias should therefore not be considered as extra-systemic. Zeitoun and Kaybaybaw (2021) make a similar claim about onomatopoeias and ideophones in Saisiyat—another higher-order Austronesian language that exhibits Philippine-type syntax.

In terms of phonology, onomatopoeic expressions generally follow phonological regularities usual to the Puyuma lexicon. All vowels and consonants are observed in these imitations. Some imitations borrow the phonetic inventory (and suprasegmental features) available in Taiwan's language environment. Puyuma onomatopoeias repre-

sent a wide variety of sound types (see the appendix for details). With respect to the sound of living creatures, it is noteworthy that the language exhibits a particularly rich inventory of bird calls but lacks imitations of the sound of marine animals.

Abbreviations

AV actor voice, CAU causative, EXIST existential, IMP imperative, IRR irrealis, LOC locative, LV locative voice, NMZ nominalizer, NOM nominative, OBL oblique, ONOM onomatopoeia, PERF perfect, PFV perfective, POSS possessive, PSR possessor, RED reduplication

Appendix

	SOUND TYPES		ONOMATOPOEIA	MEANING
NATURAL SOUNDS	4 ELEMENTS	WATER	*beru*	fall of solid object into liquid, splashing
			seras	sound of rain
		AIR	*besbes*	sound of wind
			drerudrerung	sound of thunder
		EARTH	*geras*	sound of rustling leaves
			trepuk	sound of (fruit) dropping
		FIRE	*traliketrik*	sound of fire burning
			selrselr	sound of frying
	ANIMALS	MAMMALS	*lraun*	sound of a dog barking
			ngiaw	sound of a cat meowing
		BIRDS	*kuku*	call of a rooster
			'ak'ak	call of a crow
		REPTILES AND AMPHIBIANS	*'op'op*	call of a bullfrog
			tektek	call of a gecko
		INSECTS	*ngarangarawan*	sound of a bee
			ngengngeng	sound of a mosquito
		FISH AND SEA CREATURES		
	HUMAN	VOICE	*kalkal*	sound of laughter
			trepetrep	murmuring sounds
		BODY	*matreptrep*	sound of heartbeats
			patraptrap	clapping sounds

(continued)

	SOUND TYPES	ONOMATOPOEIA	MEANING
ARTIFACTS	MUSICAL INSTRUMENTS	*bengabengabenga*	sound of a horn
		sringsring	sound of a rattle
	VEHICLES	*beng*	sound of a car
		trengtreng	sound of a train
	MECHANICAL AND ELECTRONIC EQUIPMENT AND DEVICES	*tralingtring*	sound of a phone
		kalangkang	banging/hammering sounds
	INSTRUMENTS OF WAR AND DESTRUCTION		
	BELLS, GONGS AND OTHER SIGNALING EQUIPMENT	*singsing*	sound of a bell ringing
		trektrek	sound of a clock ticking

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