Describing Phoneme Inventory of Santali Language : A Linguistic Approach

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[Abstract : The Santals themselves call their language [hɔɽ rəɽ] which means the 'speech of Santal people'. It is a language belonging to the Oriental branch of the Austro-Asiatic language family. In India, the Santali language is known by various names like Jangli, Pahariya, Majhi etcetera. This is an empirical study. This paper provides an insight into Santali phoneme inventory, which is a set of distinct speech sounds based on the evidence from Bangladesh. The phoneme inventory consists of vowels, consonants, semivowels, diphthongs, and nasalization of vowels. Besides, this paper tends to focus on distinctive features of the Santali language. The phoneme inventory of the Santali language has been identified by using minimal and sub-minimal pair testing.

Keyword : Santali, phoneme, minimal pair, distinctive feature, inventory

1. Introduction

The Santals are the largest in number among the plain land ethnic minorities of the Northern part of Bangladesh though the majority of the Santals live in India with scattered settlements in Nepal and Bhutan. According to Sourav Sikder (2011) "there are about 33 languages spoken in Bangladesh apart from Bangla". These languages belong to four different and large language families of the world. Santali is a language belonging to the Munda group of the Austro-Asiatic language family (Arun Gosh, 2008). It is one of the major ethnic minority languages of Bangladesh. Subodh Ghosh has shown two branches of the original Austronesian language in his book 'Indigenous Peoples in India' one is 'Khasi' from Assam and the other one is 'Mundari' (Subodh Ghosh, 2000). The Santals call themselves [hɔɽ] which means Human Being and their language [hɔɽ rəɽ] that means Human Speech (Grierson, 1903). In India, the Santali language is known by various names like Jangli, Pahariya, Majhi etcetera. But their language is widely known as Santali outside of the community. Gregory D. S. Anderson (1999) states "Santali language is originated from the Kherwari sub-branch of the northern Munda branch". It is prominent among the Kherwari languages of the Mundari branch. George A. Grierson (1903) claims that "Santali is the dialect of Mundari whereas Karmali and Mahle are the dialects of Santali language". Though dialectal variants of Santali are found in India, there is no such evidence

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found of the variant spoken by the Bangladeshi Santals. As the Santals are living in this country for a long time, the words of many neighboring languages have entered into the Santali language. But it did not create any dialectal variant. The Santals live in the Rajshahi and Rangpur divisions of northwestern Bangladesh. According to Gabriel Hasda (2009) "a considerable number of Santals are found in Rajshahi, Naogaon, Chapai Nababganj, Bogura, Dinajpur, and Thakurgaon districts in these divisions". Sourav Sikder (2011) claims that " apart from these areas a small number of Santals live in Khagrachori Hill district and a total of more than two lacs Santals reside in Bangladesh". The Population Census Report of Bangladesh 2011 states that the total number of Santals living in Bangladesh is approximately 1,47,112 (BBS, 2011). But the Santali researcher Albert Soren denied these numbers and claims with reference to "different surveys conducted by NGOs, there are more than four lacs Santals live in Bangladesh". Besides World Bank Report (2008) stated that the number of Santals in Bangladesh is around 3,00,000.

However, the Santali language belongs to the Astro-Asiatic language family (Raymond Gordon, 2005) and is considered to be one of the oldest and enriched languages of the Indian Sub-continent (George A. Grierson, 1903). The typology of the Santali language is agglutinating and suffixing. The basic syntactic structure is SOV (Subject+Object+Verb). This language has an elaborate system of vowel and consonant phonemes. There are eight vowel phonemes with nasalized counterparts except /o/ and /e/. Besides, there are thirty-two consonant phonemes found in the Santali language. Also, there are nineteen diphthongs with descending, level, and ascending features represented in this paper.

2. Rationale and Objective of the study

Santali is the largest ethnic minority language in the northern part of Bangladesh. The phoneme inventory is very enriched. There has been done extensive research on the Santali language in India. But in our country, there is no or little work has been done linguistically in this context. Through this research, it will be possible to gain detailed knowledge about the phoneme inventory of the Santali language. Besides, it will also contribute to future research on related issues. This study aims to achieve the following objectives-

i. Identification of vowel and consonant sounds of Santali language.
ii. Representation of diphthongs and semivowels.
iii. Realization of the nature of identified phonemes.
iv. Compilation of the related concepts of the Santali phonemes.

3. Literature Review

There is a lot of research works have been found on Santali culture, customs, rituals, and societal aspects by Gabriel Hasda, Abdur Sattar, and many other researchers. The only notable research that has been done on the Santali language

in the linguistic of view so far is "Indigenous Languages of Bangladesh" authored by Sourav Sikder. In this book, he has written about the Santali language and explained it linguistically. According to him "there are 7 vowels, 31 consonants, and 2 semivowels in Santali language (Sourav Sikder, 2011)". Besides, Albert Soren has contributed linguistically on a small scale. Nonetheless, a lot of research has been done on the Santali language outside Bangladesh. Those who have done linguistic research on the Santali language are- George A. Grierson (Linguistic Survey of India, 1903), Jeremiah Philips (An Introduction to Santal Language, 1852) Rev. L. O. Skrefsrud (A Grammar of the Santhal Language, 1873), Rev. P.O. Bodding (A Santali Grammar for the Beginners, 1929), Campbell A. (Santali-English Dictionary, 1899), Gregory D. S. Anderson (The Munda Languages, 2008), Arun Ghosh (Grammar of Santali, 2008), et al.

According to Gregory D. S. Anderson (2008) "there are eight vowels, 20 consonants, and 17 diphthongs in Santali language". Besides, Arun Ghosh (2008) narrates the consonant inventory consists of five categories of plosives distinguished with regard to five places of articulation (labial, alveolar, post-alveolar, palatal, and velar), a nasal corresponding to each, one trill, one flap, one lateral, two fricatives, and two semivowels.

5. Methodology and Data Collection

This study is exploratory. The qualitative method was adopted to conduct this study. Primary and secondary sources have been used to accomplish the research. An extensive series of face-to-face informal interviews were taken with a well-formed questionnaire to collect the primary data. The questionnaire consist of two parts- a) demographic inquiry and b) linguistic inquiry. The demographic part inquired about the participants' gender, age, mono/bi/multilingual, ethnicity, location, education, occupation, and marital status. The linguistic part was designed with a word list and some basic sentences which are considered to be frequently used in daily conversation. Including Swadesh's word list (207 words), a list of around 400 words was compiled in a word list. The list was made up of different word categories such as accessories, actions, appearance, clothing, body parts, household, colors, culture, festival, daily routine, animal (domestic and wild), food, nature, weather, directions, numeral, and so on. Some basic sentences related to the daily conversation were also included in the questionnaire.

The study population was purposively sampled from Naogaon and Dinajpur districts because the majority of Bangladeshi Santal live in these two areas. Ten participants who are native and fluent in speaking the Santali language were selected for the interview to obtain the required data. Eight of the participants are Bilingual (Santali and Bangla) and six are Multilingual (Santali, Bangla, and Sadri). To ensure the representativeness of the study, a set of the social parameter

was considered before selecting the participants such as gender, age, education, etc. apart from their linguistic ability and regional factor. Among the sampled participants, six were male and four were female. Besides, four participants (two male and two female) were consulted from the same region to validate the collected data. Among the participants, there were farmers, grocers, laborers, and housewives. The age range of the participants was 25-30 years old. Moreover, they were at least class Eight passed.

The data was collected in a quiet room and the participants were asked to answer every word and sentence 03 times and the conversations were recorded thoroughly. With prior acknowledgment and permission from the participants, all the interview sessions were recorded in audio and video format and archived for a certain period in a password-protected computer where the data can be accessed only by the researcher. Despite this, two of them were uncomfortable to be recorded and filmed. That's why their conversations were not stored to maintain the transparency and ethical issues of the research. While interviewing, the researcher also took notes on different aspects. There were two sessions with every participant. At the end of every first session of the interview, the researcher talked about different issues with the participant to make them easy and spontaneous. When all the interviews were finished, the collected data was validated to check for error by four Santali language speakers from the same region. Finally, except for the primary data, different books and journals were analyzed associated with Santali phonemes as a secondary source of the study.

6. Analysis and Findings

Before starting the analysis, the collected data were broadly transcribed with International Phonetic Alphabet (IPA). The recorded sessions were filtered by an audio filtering computer software, 'Audacity', so that the audio quality improves and correct pronunciation can be detected. At first, the phonetic similarity was investigated to mark the articulation of the sounds. Then, the distribution of Santali sounds was checked to find the sound pattern. Words were categorized to examine the relations between the sounds of the language so that they can be contrastive. Minimal pair was tested to identify the distinct phonemes of the Santali language. Because Harriet J. Ottenheimer (2012) emphasizes that a minimal pair test is "the clearest and easiest way to identify phonemes in a language". James A. McGilvray (2005) provides a clear definition of a minimal pair in 'The Cambridge Companion to Chomsky', "a minimal pair is a pair of words that differ in a single phoneme". Minimal pairs are often used to show that two sounds contrast in a language. Besides, the sub-minimal pair was also tested where minimal pairs were unavailable. Every possible sound contrast was made to spot the phonemes. For consonant phonemes, place and manner of articulation were identified by listening to the audio record and viewing the video. Moreover, the roundness, openness, frontness, and backness of the lip and the position of the soft palate were examined to pinpoint the vowel phonemes.

After the extensive study on collected and elicited data, the Santali phoneme inventory was composed. This inventory consisted of 8 vowels, 32 consonants, 19 diphthongs, and 2 semivowels. Besides, these phonemes were broadly narrated based on their place and manner of articulation. The study explained the nature of these phonemes below-

6.1 Vowel Phonemes

"Vowels are syllabic sounds made with the free passage of air down the mid-line of the vocal tract, usually with a convex tongue shape, and without friction (Ogden, 2009)". There are eight vowels found in the Santali language. These are- /i/, /e/, /a/, /u/, /o/, /ɔ/, /ə/, and /ɛ/. The vowels are oral. In the following table vowels of the Santali language were discussed with examples :

Serial No.	Vowels	Santali Word (IPA)	Meaning
1.	/i/	[bili]	Egg
2.	/e/	[ber]	Sun
3.	/a/	[am]	You
4.	/ə/	[kətup]	Finger
5.	/o/	[otaŋ]	Blow away
6.	/ɔ/	[anɟɔm]	To listen
7.	/u/	[kuɽi]	Girl
8.	/ɛ/	[bɛŋgaɽ]	Brinjal

Table-1 : Santali vowels with example.

6.1.1 Distribution Chart for Santali Vowel

It has been observed that Santali vowels are used in the initial, medial, and final positions of a word. The distribution chart for vowels was shown below–

(IPA)	(Initial)	(Medial)	(Final)
/i/	+	+	+
/e/	+	+	+
/ɛ/	+	+	+
/a/	+	+	+
/ə/	+	+	+
/ɔ/	+	+	+
/o/	+	+	+
/u/	+	+	+

Table-2 : Distribution Chart for Santali Vowels.

This study also tries to justify the distribution of vowels in different positions by making contrastive minimal and sub-minimal pairs from collected data. These are shown below with illustration for better understanding–

Santali Vowels	Initial		Medial		Final	
	Word (IPA)	Meaning	Word (IPA)	Meaning	Word (IPA)	Meaning
/i/	[il]	Feather	[ɟil]	Meat	[t̪i]	Hand
/e/	[egar]	To take responsibility	[ber]	Sun	[d̪are]	Tree
/ɛ/	[ɛgɛr]	To scold	[hɛl]	Bind together	[aɾɛ]	Proximity
/a/	[alaŋ]	Tongue	[raʃi]	Curry	[moka]	Elbow
/ə/	[əḍi]	Very much	[gəḍi]	Carriage	[iṯə]	Seed
/ɔ/	[ɔr]	Pull	[rɔɽ]	To speak	[ɟɔ]	Fruit
/o/	[oɽak']	House	[kol]	To send	[hako]	Fish
/u/	[ul']	Gallop	[kul]	Lion	[ət̪u]	Flow

Table-3 : Distribution Chart for Santali vowels with illustrations.

6.1.2 Nasalization of Santali vowel

The study explores six nasalized forms of Santali vowels which were attested below with examples–

Serial No.	Nasalized Vowel	Santali Word (IPA)	Meaning
1.	/ĩ/	[mĩrũ]	Formless
2.	/ɛ̃/	[hɛ̃c']	Heavy
3.	/ə̃/	[kə̃r]	Thorny Leaf
4.	/ã/	[ãk']	Under
5.	/ɔ̃/	[hɔ̃]	Besides
6.	/ũ/	[ũt̪]	Camel

Table-4 : Nasalization of Santali vowel with examples.

6.1.3 Distinctive features of Santali vowels

This paper presents three parameters for measuring vowels of the Santali language. These are :

i. Height of the tongue : These vowels are made with the body of the tongue close to the roof of the mouth while the low vowels are made with the mouth open and the body of the tongue away from the roof of the mouth. There four types of Santali vowels based on the height of the tongue namely- High (/i/, /u/); High-Mid (/e/, /ə/, /o/) Low-Mid (/ɛ/, /ɔ/); and Low (/a/).

ii. Position of the tongue : When the vowels are produced with the body of the tongue toward the front, back, and central position of the mouth. These are- Front (/i/, /e/, /ɛ/), Mid (/ə/, /a/), and Back (/u/, /o/, /ɔ/).

iii. The roundness of the tongue : Another distinctive feature of Santali vowels is whether the lips are rounded or unrounded while producing them. Based on this feature the Santali vowels are divided into- Rounded (/ɔ/, /o/, /u/) and Unrounded (/i/, /e/, /ɛ/, /a/, /ə/) forms.

The distinctive features of Santali vowels were concisely presented below–

Vowels / Features	/i/	/e/	/ɛ/	/a/	/ə/	/ɔ/	/o/	/u/
High	+	-	-	-	-	-	-	+
High-Mid	-	+	-	-	+	-	+	-
Low-Mid	-	-	+	-	-	+	-	-
Low	-	-	-	+	-	-	-	-
Front	+	+	+	-	-	-	-	-
Back	-	-	-	-	-	+	+	+
Mid	-	-	-	+	+	-	-	-
Rounded	-	-	-	-	-	+	+	+
Unrounded	+	+	+	+	+	-	-	-

Table-5 : Distinctive features for Santali vowels.

6.2 Santali Diphthongs

As we know "diphthongs are vowel segments where the tongue position moves from one point to another during a single syllable (Martin J. Ball and Joan Rahilly, 2013)", there has been found nineteen distinct diphthongs in Santali Language. These are- /oa/, /ɔe/, /eo/, /əi/, /iə/, /ui/, /ɛi/, /əu/, /ea/, /ɛa/, /ae/, /ai/, /uə/, /iu/, /ei/, /oe/, /oi/, /ao/ and /ɛo/. The Santali diphthongs were discussed with examples and given below in a table–

Serial No.	Diphthongs	Santali Word (IPA)	Meaning
1.	/oa/	[ʈ̪oa]	Milk
2.	/ɔe/	[ɔkɔe]	Who
3.	/eo/	[beohar]	To use
4.	/əi/	[kəi]	Sin
5.	/iə/	[kəkĩə]	To shout
6.	/ui/	[ʈ̪urui]	Seven
7.	/ɛi/	[ɛnɛic']	To dance
8.	/əu/	[uɖəu]	To fly
9.	/ea/	[reaɽ]	Cold
10.	/ɛa/	[gɛaʈ̪]	To cut
11.	/ae/	[kaera]	Banana
12.	/ai/	[baɖai]	To know
13.	/uə/	[ʈuər]	Orphan
14.	/iu/	[maeɟiu]	Woman

15.	/ei/	[meila]	Fair
16.	/oe/	[hoe]	To become
17.	/oi/	[poi]	Punishment
18.	/ao/	[haɳao]	To take
19.	/ɛo/	[lɛoʈʰe]	Stick to

Table-6 : Diphthongs of Santali Language with example.

6.2.1 Types of Santali Diphthongs

This study has found three kinds of diphthongs – descending (after glide), ascending (before glide), and level (both vowels are equally strong). These types were discussed below–

Types	Diphthong (IPA)
Descending	/ae/, /ai/, /ao/, /əi/, /ei/, /əu/, /ɛo/, /ɛi/, /ɔe/, /oe/, /oi/
Ascending	/ea/, /oa/, /iə/, /ɛa/, /uə/
Level	/iu/, /ui/, /eo/

Table-7 : Types of Santali Diphthong

The formation of aforesaid diphthongs was shown below in a table :

V_1 \ V_2	i	e	ɛ	a	ə	ɔ	o	u
i					iə			iu
e	ei			ea			eo	
ɛ	ɛi			ɛa			ɛo	
a	ai	ae					ao	
ə	əi							əu
ɔ		ɔe						
o	oi	oe		oa				
u	ui				uə			

Table-8 : Formation of Santali Diphthong

6.3 Santali Semivowels

Semivowel is a sound in the speech that has some qualities of a consonant and some qualities of a vowel. Semivowel and glide are synonymous. "Glides are moving vowels; they move rapidly from one vowel position to another; vowels, on the other hand, have a relatively steady articulation (Henry Rogers, 2013)". There are two semivowels in the Santali language. These were depicted in the table below–

Serial No.	Semivowel	Santali Word (IPA)	Meaning
1	/ʋ/	[naʋa]	New
2	/j/	[ɲijuʈ]	Dark

Table-9 : Semivowels of Santali Language with example.

6.4 Santali Consonants

While producing a sound if there is some sort of obstruction in the vocal tract or mouth then the sound is called Consonant. This study has found 32 consonant phonemes by analyzing the collected data. These are- /k/, /kʰ/, /g/, /gʰ/, /ŋ/, /c/, /cʰ/, /ɟ/, /ɟʰ/, /t/, /tʰ/, /d/, /dʰ/, /ʈ/, /ʈʰ/, /ɖ/, /ɖʰ/, /n/, /p/, /pʰ/, /b/, /bʰ/, /m/, /ɲ/, /r/, /l/, /ʃ/, /s/, /h/, /ʈ/, /ɖ/, /ɽ/. These phonemes are divided into two parameters- one is their place (bilabial, dental, alveolar, post-alveolar, retroflex, palatal, velar, and glottal) and another one is their manner (plosives, nasal, trill, tap, fricative, and lateral approximant) of articulation.

6.4.1 Place of Articulation of Santali Consonants

There are eight points of contact in the Santali language where an obstruction occurs in the vocal tract between the tongue and some part of the roof of the mouth. The place of these Santali phonemes is described respectively–

i. Bilabial : These types of phonemes are produced with the help of upper and lower lips. In this study /p/, /b/, /pʰ/, /bʰ/, and /m/ are bilabial in nature.

ii. Dental : /ʈ/, /ɖ/, /ʈʰ/, and /ɖʰ/ are dental phonemes of Santali language as they are produced with the tongue against upper teeth.

iii. Alveolar : The collected data shows that /d/, /dʰ/, /t/, /tʰ/, /n/, /r/, /l/, and /s/ are alveolar phonemes because the tip of tongue closely touches the superior alveolar ridge.

iv. Post-alveolar : There is only one post-alveolar phoneme found in the Santali language e.g. /ʃ/.

v. Retroflex : When the tongue has a flat, concave, or even curled shape, and is articulated between the alveolar ridge and the hard palate, retroflex sounds are produced. There are three retroflex phonemes in the Santali language. These are- /ʈ/, /ɖ/, and /ɽ/.

vi. Palatal : There are six palatal phonemes in the Santali language as /c/, /cʰ/, /ɟ/, /ɟʰ/, /ɲ/, and /j/ are articulated when the tongue raised against the hard palate.

vii. Velar : The velar phonemes are produced when the back part of the tongue makes contact against the soft palate. /k/, /kʰ/, /g/, /gʰ/, and /ŋ/ velars in Santali language.

viii. Glottal : When the airflow from the lung gets obstructed in the vocal tract glottal sound is produced. Analyzed data shows that /h/ is a glottal phoneme.

6.4.2 Manner of Articulation of Santali Consonants

How closely the speech organs approach one another is determined as manner of articulation. The manner of articulation of Santali language is described below-

1. Plosives : /p/, /b/, /pʰ/, /bʰ/, /t̪/, /d̪/, /t̪ʰ/, /d̪ʰ/, /d/, /dʰ/, /ʈ/, /ɖ/, /c/, /cʰ/, /ɟ/, /ɟʰ/, /k/, /g/, /kʰ/, and /gʰ/ are the plosive consonant of Santali language.
2. Nasal : There are four nasal consonants found in this study. These are- /m/, /n/, /ɲ/, and /ŋ/.
3. Trill : /r/ is the trill consonant in the Santali language because it is made by the articulator being held in place and the airstream causing it to vibrate.
4. Tap : This paper shows one tap consonant e.g. /ɽ/ in the Santali language.
5. Fricative : There are three fricative consonants found in this study. These are- /s/, /ʃ/, and /h/.
6. Lateral Approximant : /l/ is the only lateral approximant in the Santali language.

The Consonant phonemes of the Santali language were given below based on the place and Manner of Articulation.

Place / Manner	Bilabial	Dental	Alveolar	Post-alveolar	Retroflex	Palatal	Velar	Glottal
Plosives	p b pʰ bʰ	t̪ d̪ t̪ʰ d̪ʰ	d t dʰ tʰ		ʈ ɖ	c cʰ ɟ ɟʰ	k g kʰ gʰ	
Nasal	m		n			ɲ	ŋ	
Trill			r					
Tap					ɽ			
Fricative			s	ʃ				h
Lateral Approximant			l					

Table-10 : Santali consonant chart based on place and manner of articulation.

These consonants were shown below with examples–

Serial No.	Consonants	Santali Word (IPA)	Meaning
1.	/k/	[kul]	Lion
2.	/kʰ/	[kʰanɖririŋ]	Deep
3.	/g/	[guɖu]	Mouse
4.	/gʰ/	[gʰənti]	Bell
5.	/ŋ/	[muŋ]	Green Gram
6.	/c/	[bickom]	Rather
7.	/cʰ/	[cʰal]	Bark
8.	/ɟ/	[ɟil]	Meal
9.	/ɟʰ/	[aɟʰnar]	Sister-in-law
10.	/t/	[luti]	Lips
11.	/tʰ/	[kantʰar]	Jackfruit
12.	/d/	[data]	Tooth
13.	/dʰ/	[dʰaŋ]	Stuck
14.	/ʈ/	[ʈur]	Squirrel
15.	/ʈʰ/	[ʈʰapa]	Slap
16.	/ɖ/	[ɖiriŋ]	Horn
17.	/ɖʰ/	[ɖʰərʈi]	Earth
18.	/n/	[ɖɔn]	To leap
19.	/p/	[pɔrəb]	Festival
20.	/pʰ/	[pʰada]	Open
21.	/b/	[baha]	Flower
22.	/bʰ/	[bʰar]	Burden
23.	/m/	[ɖare]	Tree
24.	/ɲ/	[ɲu]	To drink
25.	/r/	[rama]	Nail
26.	/l/	[luʈur]	Ear
27.	/ʃ/	[ʃəri]	Truth
28.	/s/	[pusi]	Cat
29.	/h/	[hako]	Fish
30.	/ɽ/	[kalɔɽ]	Baby Chicken
31.	/ɖ/	[gaɖa]	River
32.	/ɽ/	[hɔɽ]	Man

Table-11 : Santali consonant inventory with examples.

6.4.3 Identification of Santali consonant phonemes

Minimal pair has been made with the collected field data from the Santali language. These pairs are tested in the initial, mid, and final positions of the word. Sometimes, not all three pairs are found because there is a paucity of collected words. The consonant oppositions were given below-

6.4.3.1 Voiceless vs Voiced

Phoneme	Initial		Mid		Final	
/p/ vs /b/	[pɔrɔb] Festival	[bɔrɔp] Ice	[ape] You	[aben] Two of you	[bɔrɔp] Ice	[pɔrɔb] Festival
/ʈ/ vs /ɖ/	[ʈala] Mid	[ɖal] To beat	-	-	[aʈo] Village	[aɖɔ] Then
/c/ vs /ɟ/	[celeɲ] Who	[ɟeleɲ] Long	-	-	-	-
/k/ vs /g/	[kalɔʈ] Baby Chicken	[galɔʈ] To be agreed	[aka] To hang	[aga] To exaggerate	-	-
/ʈ/ vs /ɖ/	[ʈalao] To disobey	[ɖalao] To make	[suʈur] Rustle	[suɖur] To fall	[laʈ] Rights	[lɛɖ] Horseshit

Table-12 : Identification of voiceless vs voiced phonemes of Santali language.

6.4.3.2 Unaspirated vs Aspirated

Phoneme	Initial		Mid		Final	
/p/ vs /pʰ/	[paɽak] To spill	[pʰarak] Difference	[ape] You	[apʰɔr] sow	-	-
/b/ vs /bʰ/	[bar] two	[bʰar] burden	-	-	-	-
/ʈ/ vs /ʈʰ/	[ʈala] Mid	[ʈʰapa] To slap	[kiʈəb] Book	[kɔʈʰne] To pretend	-	-
/ɖ/ vs /ɖʰ/	[ɖiri] To be late	[ɖʰiri] Stone	[baɖa] To borrow seed	[baɖʰa] To stop	-	-
/c/ vs /cʰ/	[cal] To	[cʰal] Bark	-	-	-	-
/ɟ/ vs /ɟʰ/	[ɟal] To lick	[ɟʰəl] Far	[aɟnar] To examine	[aɟʰnar] Sister-in-law	-	-
/t/ vs /tʰ/	[kitli] Kettle	[kutʰri] Room	-	-	-	-
/d/ vs /dʰ/	[daŋgra] Bull	[dʰaŋ] Stuck	-	-	-	-
/k/ vs /kʰ/	-	-	[bakɽa] Derailed	[bakʰɽa] Part	-	-

Table-13 : Identification of unaspirated vs aspirated phonemes of Santali language.

6.4.3.3 Trill vs Lateral Approximant

Phoneme	Initial		Mid		Final	
/r/ vs /l/	[rəi] Rye	[ləic'] Male sex organ	[arɛ] Nine	[ale] We	[ber] Time	[bel] Bedding

Table14 : Identification of trill vs lateral approximant of Santali language.

6.4.3.4 Nasals

Phoneme	Initial		Mid		Final	
/m/ vs /n/	-	-	[eman] Similar	[enaŋ] A little bit ago	[ɖɔm] Interval	[ɖɔn] To leap
/n/ vs /ɲ/	[naram] Soft	[ɲaɽam] To suck	-	-	[in] To force	[iɲ] I
/n/ vs /ŋ/	-	-	-	-	[mun] Astrologer	[muŋ] Green Gram

Table-15 : Identification of Santali nasal phonemes.

6.4.3.5 Trill vs Tap

Phoneme	Initial		Mid		Final	
/r/ vs /ɽ/	-	-	[ara'] Red	[aɽa] Portion	[bar] Two	[baɽ] Swamp

Table-16 : Identification of trill vs tap phonemes.

6.4.3.6 Fricatives

Phoneme	Initial		Mid		Final	
/s/ vs /ʃ/	[sim] Chicken	[ʃiŋ] Day	-	-	-	-
/s/ vs /h/	[sakam] Leaf	[hako] Fish	[busup'] Straw	[baha] Flower	-	-

Table-17 : Identification of Santali fricative phonemes.

7. Limitation of the study

Though Santali is a widely spoken language in India and Bangladesh, this study lacks evidence from India. This research was conducted based on the Santali speakers of Bangladesh which could be a matter of question. Besides, linguistic

tools were scarce. Unfortunately, this study lacks the use of a palatography kit. Thus, phonemes were identified based on listening and seeing the audiovisually recorded sessions. Also, the syllabic structure, allophonic variation, and other phonological aspects were not covered in this study. A flexible time frame is an important factor for any empirical research. However, this research was done within a very short time frame that is a basic limitation of this study. As a result, this paper is not able to highlight all salient characteristics of Santali phonemes. It has only shown the approximate numbers of phonemes of the Santali language.

8. Conclusion

Santali is a very enriched language and its phoneme inventory is diverse and distinct. It is a Munda language from the Austro-Asiatic language family. There are eight vowels, without any significant length. These vowels may be short or long. This study also finds six nasalized vowels. Consonants are produced with five manners in eight different places of the oral cavity. Diphthongs occur with descending, ascending, and level varieties whereas the descending diphthongs are dominant among 19 diphthongs of the Santali language. The Consonant cluster is absent in this study as well as allophonic variation. On the other hand, aspirated consonants are found in this study.

References

A. Campbell (1899). *Santali-English Dictionary*. The Santal Mission Press, Manbhum.

A. Dey (2015). *An Ancient History : Ethnographic Study of the Santhal*. International Journal of Novel Research in Humanity and Social Sciences, 2(4), 31-38.

Arun Ghosh (2008). *Santali. In: Anderson, G. The Munda Languages*. Routledge, London.

BBS (2011). *The Population Census Report*. Dhaka: Bangladesh Bureau of Statistics.

digenous People in India. National Book Agency Private Ltd., Calcutta.

Gabriel Hasda (2009). *Santal Society and Customs*. Borsha Private Ltd, Dhaka.

George A. Grierson (ed.) (1903). *Linguistic Survey of India (vol iv. part I).* Low Price Publications, New Delhi.

Gregory D. S. Anderson (2008). *The Munda Languages*. Routledge Publications LTD, New York.

Gregory D.S. Anderson (1999). '*A new classification of the Munda languages: Evidence from comparative verb morphology*', Paper presented at 209th meeting of the American Oriental Society, Baltimore, MD.

Harriet J. Ottenheimer (2012). *The Anthropology of Language: An Introduction to Linguistic Anthropology*. Cengage Learning.

Henry Rogers, (2013). *The Sounds of Language: An Introduction to Phonetics*. Routledge, New York.

James A. McGilvray (2005). *The Cambridge Companion to Chomsky*. Cambridge University Press.

Martin J. Ball and Joan Rahilly (2013). *Phonetics: The Science of Speech*. Routledge, New York.

Raymond Gordon, (ed.) (2005). *Ethnologue: Languages of the World, 15th Edn. Dallas, Tex*.: SIL International. Online version: http://www.ethnologue.com

Rev. L. O. Skrefsrud (1873). *A Grammar of the Santali Language*. Medical Hall Press, Calcutta.

Richard Ogden (2009). *An Introduction to English Phonetics*. Edinburgh University Press Ltd, Edinburgh.

Sourav Sikder (2011). *Indigenous Languages of Bangladesh*. Bangla Academy, Dhaka.

Subodh Ghosh (2000). *Inon the other*

World Bank (2008). "Bangladesh-indigenous/tribal population and access to secondary schools (draft): indigenous peoples plan", report no.- IPP280, vol. 1 of 1. Retrieved from http://www-wds.worldbank.org