

## Relevance of Pāṇini's sound catalog and it's appliance in language study

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### ABSTRACT

Study of Sanskrit Language and literature is well recognized as a curriculum of both Indian and International Universities in the 21<sup>st</sup> century. Wisdom of Sanskrit language is not achievable without taking the help of Pāṇini's language rules. A logical enlightenment of the structure of words in a language is not anything but the grammar itself. Pāṇini's grammar is the only solution to comprehend the Sanskrit language and literature. In this connection, Pāṇini's work *Aṣṭādhyāyī* is a stylistic approach of grammatical literature. *Aṣṭādhyāyī* is just like the Sun which imparts light to other revolving planets. Sanskrit language and Pāṇinian system of grammar are the two sides of a coin. Mastery of Sanskrit language is not possible without study of Pāṇinian rules on grammar. The current study is a humble effort to discuss the Pāṇinian terminology of phonetics in Sanskrit and its appliance.

**KEY WORDS:** *Aṣṭādhyāyī*, Pāṇini, Sūtra, Kāśikā, Sanskrit Grammar, Phonetics

Date of Submission: 13-02-2022

Date of Acceptance: 28-02-2022

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### I. INTRODUCTION

The Pāṇinian grammar has four distinct components:

- **Aṣṭādhyāyī**: a system of about 4000 grammatical rules.
- **Sivasūtras**: the catalog of phonological segments, partitioned by markers (*anubandhas*) to allow classes of segments (*pratyāhāras*) to be designated by a set of special conventions.
- **Dhātupāṭha**: a list of about 2000 verbal roots, with sub-classification and diacritic markers encoding their morphological and syntactic properties.
- **Gaṇapāṭha**: a list of 261 lists of lexical items which are distinctively subject to certain rules. Some of the lists are open-ended, and (like the *Dhātupāṭha*) they have to some extent been modified by later grammarians.

The rules of *Aṣṭādhyāyī* make reference to classes described on the elements in the other three components by means of conventions spelled out by rules of the *Aṣṭādhyāyī* itself. Thus, while none of the components is intelligible in isolation, together they constitute a complete integrated grammar and glossary. The core of Pāṇini's grammar is a set of statements called *sūtra*. The *sūtra* text (*sūtrapāṭha*) is known as the *Aṣṭādhyāyī*. This text consisting of eight chapters containing in all 3981 aphorisms (*sūtras*), found in the traditional recital method was current in the times of *Vāmana & Jayāditya*, the reputed authors of the *Kāśikāvṛtti* in the 7<sup>th</sup> century A.D. Each chapters being again subdivided into four sub chapter (*pādas*) containing several aphorisms. This grammar *Aṣṭādhyāyī* opens with an arrangement of the alphabets not in their natural order known to us, but in a specific order. In the illustrations to several aphorisms, the *Kāśikā* speaks of the Pāṇinian system as an untimely (*akāla*) grammar. The name is significant as showing that Pāṇini wisely excluded from his purview the discussion of tense like indirect (*parokṣa*) and present (*vartamāna*) on the exact definition of which subtle and elaborate arguments were often advanced grammarians. Though the *Aṣṭādhyāyī* was a marked improvement on the Vedic grammatical text (*Prātiśākhya*) and supersedes to other grammars by its scientific manner, yet its arrangement, shortness, brevity and technicalities rendered it a hard nut to crack. The aphorisms relating to a particular topic are not given consecutively, but are scattered in several chapters the collection of which is impossible, unless the whole is not gone through and indeed is not got up by heart. Pāṇini's description of the Sanskrit language in his *Aṣṭādhyāyī* stands out as a unique achievement of human civilization for its subtle and astonishing analysis of the components of a language. As the brightest example of descriptive grammar, it is a treasure house of linguistic information in all its convincing and clearest details. At

the same time, its worth lies in scientific nature and its fitness as training for our understanding the Indian methods of composition. Both from the internal and external evidences, it has been established and also accepted that Pāṇini lived in seventh century B.C. He was born in *Śalātura*, a place now in Peshawar district of Pakistan. According to the literary sources Pāṇini was the son of *Paṇi* and *Dākṣi*. A wide travelled and a well-read scholar as he was, Pāṇini, due to the grace of the Lord of Universe (*Maheśvara*), composed the unparalleled and the master-mind work on Sanskrit grammar, a work which surpassed not only the works of earlier predecessors but also has eclipsed all the subsequent works written on grammar till this day.<sup>1</sup>

## 1. Pāṇini's Sound Catalog

The pupils of Pāṇini use several terms to refer to sound catalog. The oldest of these is *akṣarasamāmnāya*, used in the *Mahābhāṣya*, where *Patañjali* also uses *ākṣarasamāmnāyika* found in the *akṣarasamāmnāya* with reference to sound of this catalog. The term *akṣarasamāmnāya* is equivalent to *varṇasamāmnāya*, used elsewhere (*atha varṇasamāmnāya*-Now the traditional set of sounds) of a sound catalog: *akṣara* and *varṇa* both signify sounds. Pāṇini's *akṣarasamāmnāya*, the sound catalog that accompanies his corpus of *sūtras*, consists of fourteen groups of sounds, each closed by a consonantal marker as mentioned below.

### 1.1 Pāṇini's akṣarasamāmnāya

(1) *a i u ṅ* (2) *r ḷ k* (3) *e o ṅ* (4) *ai au c* (5) *h y v r ḥ* (6) *ḷ ṅ* (7) *ṅ m ṅ n m* (8) *jh bh ṅ* (9) *gh ḍh dh ṣ* (10) *jb g ḍ d ś* (11) *kh ph ch ṭh th c ṭ t v* (12) *k p y* (13) *ś ṣ s r* (14) *h l*

### 1.2 Abbreviator term (*Pratyāhāra*) used in *Aṣṭādhyāyī* for various sounds

Basing on the sound catalog, Pāṇini uses forty one (41) abbreviator terms denoting groups of sounds as arranged in his sound catalog. Markers serve to form abbreviations that refer to members of ordered groups. The first (*adih*) component of such an abbreviation is an item *i* of a group. This occurs with (*saha*) a marker (*ita*) that is the final (*antyena*) sound of an item or of a subgroup in Panini's Sound Catalog (*akṣarasamāmnāya*).<sup>2</sup> *Kāśikāvṛtti*, the famous commentary text on *Aṣṭādhyāyī* recommend a Sanskrit verse in which all the 41 numbers of abbreviator terms are presented in literary form.<sup>3</sup>

एकस्मान् उज्जवटा द्वाभ्या षः त्रिभ्य एव कणमाः स्युः ।

जेयौ चयौ चतुर्भ्यो रः पञ्चभ्यः शलौ षड्भ्यः ॥<sup>4</sup>

This above Sanskrit verse is very much helpful to the learners of Sanskrit grammar and also to the researcher of phonetics in Sanskrit language. The following table will also be tool of research to find out the abbreviator term used in various aphorisms in *Aṣṭādhyāyī*.

Sl.No.	Abbreviator	Group of sounds	<i>Aṣṭādhyāyī</i> (A)
1.	<i>al</i>	All sounds ( <i>varṇāḥ</i> )	A 1.1.65
2.	<i>ac</i>	Vowels ( <i>svarāḥ</i> )	A 1.1.57
3.	<i>hal</i>	consonants ( <i>vyañjanāni</i> )	A 1.1.7
4.	<i>ak</i>	<i>a i u r ḷ</i> ( <i>samānākṣarāṇi</i> 'simple vowels')	A 6.1.101
5.	<i>aṅ</i>	<i>a i u</i>	A 1.1.51
6.	<i>ic</i>	<i>i u r ḷ e o ai au</i> ( <i>nāmīnaḥ</i> 'retroflexing vowels')	A 6.3.68
7.	<i>ik</i>	<i>i u r ḷ</i>	A 1.1.3
8.	<i>uk</i>	<i>u r ḷ</i>	A 4.1.5
9.	<i>ec</i>	<i>e o ai au</i> ( <i>sandhyakṣarāṇi</i> 'complex vowel')	A 6.1.78
10.	<i>eṅ</i>	<i>e o</i>	A 6.1.94
11.	<i>aic</i>	<i>ai au</i>	A 1.1.1
12.	<i>aś</i>	vowels and voiced consonants	A 8.3.17
13.	<i>am</i>	vowels, h, and semivowels and nasal stops	A 8.3.6

<sup>1</sup> *yenākṣarasamāmnāyam adhigamya maheśvarāt | kṛtsnam vyākaraṇam proktaṁ tasmai pāṇinaye namaḥ ||* (It is said that Pāṇini promulgated his grammar after receiving the sound catalog as a teaching from the great lord Śiva.) - *Pāṇinīyaśikṣā*-57

<sup>2</sup> Adirntyena sheta(A-1.1.71)

<sup>3</sup> The *Kāśikāvṛtti* or commonly known as the *Kāśikā* is the best commentary in which all the *sūtras* of *Aṣṭādhyāyī* have been commented upon in order in which they appear in the *sūtrapāṭha* by Pāṇini. The *Kāśikā* is a joint work of two authors *Jayāditya* and *Vāmana* who lived in Kashmir in 7<sup>th</sup> century A.D. – R.S. Sony, (Ed.), (2007), *Post Paninian System of Sanskrit Grammar*, Parimal Publications, Delhi, See, p.10

<sup>4</sup> See, *Vāmanajayādityavircitā Kāśikāvṛtti*, Vol.I, p.51

14.	<i>aṅ</i>	vowels, h, and semivowels	A 1.1.69
15.	<i>aṭ</i>	vowels, h, and semivowels other than l	A 8.4.63
16.	<i>iṅ</i>	vowels other than a; h and semivowels	A 8.3.57
17.	<i>haś</i>	voiced consonants ( <i>ghoṣavanta</i> )	A 6.1.114
18.	<i>yar</i>	semivowels, stops, and voiceless spirants	A 8.4.45
19.	<i>yay</i>	semivowels and stops	A 8.4.58
20.	<i>yañ</i>	semivowels and nasal stops, <i>jh bh</i>	A 7.3.101
21.	<i>yam</i>	semivowels and nasal stops	A 8.4.64
22.	<i>yaṅ</i>	semivowels ( <i>y v r l</i> ) ( <i>antaḥsthāḥ</i> )	A 6.1.77
23.	<i>val</i>	consonants other than y	A 6.1.66
24.	<i>vaś</i>	voiced consonants other than y	A 7.2.8
25.	<i>ral</i>	consonants other than y and v	A 1.2.26
26.	<i>may</i>	stops other than ñ	A 8.3.33
27.	<i>nam</i>	ñ ṅ n	A 8.3.32
28.	<i>jhal</i>	consonants other than nasal stops and semivowels	A 8.2.26
29.	<i>jhar</i>	Non-nasal stops, voiceless spirants	A 8.4.65
30.	<i>jhay</i>	Non-nasal stops	A 8.4.62
31.	<i>jhaś</i>	voiced non-nasal stops	A 8.4.53
32.	<i>jhaṣ</i>	voiced aspirated stops	A 8.2.37
33.	<i>bhaṣ</i>	voiced aspirated stops other than <i>jh</i> ( <i>ie.bh gh ḍh dh</i> )	A 8.2.37
34.	<i>jaś</i>	voiced unaspirated non-nasal stops ( <i>ie. j b g ḍ d</i> )	A 8.4.53
35.	<i>baś</i>	Voiced unaspirated non-nasal stops other than <i>j</i> ( <i>ie., b g ḍ d</i> )	A 8.2.37
36.	<i>khar</i>	Voiceless stops, voiceless spirants	A 8.4.55
37.	<i>khay</i>	voiceless stops	A 8.3.6
38.	<i>chav</i>	<i>ch ṭh th c ṭ t</i>	A 8.3.7
39.	<i>car</i>	voiceless unaspirated stops, voiceless spirants	A 8.4.54
40.	<i>śal</i>	spirants ( <i>ūṣmāṇaḥ</i> )	A 3.1.45
41.	<i>śar</i>	voiceless spirants	A 7.4.61

## 2. Pāṇini's Phonological Terminology

As can be seen from the above sound catalog and the prescribed table, Pāṇini presupposes a detailed knowledge of phonetics. Every language has its own phonological terminology. In Sanskrit, vowels are called *svara*, consonants *vyañjana*, semivowels *antaḥsthā*, and spirants *ūṣman*. The phonological terms *ghoṣavat* and *aghoṣa* refer to voiced and voiceless consonants. Stops are arranged in five classes (*varga*) of five members each as mentioned below.

Name of five stops classes in Sanskrit	Pāṇini's abbreviatory term for five stops classes	First (prathamā)	Second (dviitīyā)	Third (tṛtīyā)	Forth (caturthī)	Sixth (Pañcamī)
<i>Kavarga</i>	<i>ku</i>	<i>ka</i>	<i>kha</i>	<i>ga</i>	<i>gha</i>	<i>ma</i>
<i>Cavarga</i>	<i>cu</i>	<i>ca</i>	<i>cha</i>	<i>ja</i>	<i>jha</i>	<i>ṅa</i>
<i>ṭavarga</i>	<i>ṭu</i>	<i>ṭa</i>	<i>ṭha</i>	<i>ḍa</i>	<i>ḍha</i>	<i>ṇa</i>
<i>Tavarga</i>	<i>tu</i>	<i>ta</i>	<i>tha</i>	<i>da</i>	<i>dha</i>	<i>Na</i>
<i>Pavarga</i>	<i>pu</i>	<i>pa</i>	<i>pha</i>	<i>ba</i>	<i>bha</i>	<i>Ma</i>

The phonological terminology used in Sanskrit language is described scientifically by Pāṇinī in his grammar. This may also help to other language researchers. The following table provides idea about the Sanskrit terminology basically used for various sounds.

Sl.No.	Name of the Sound	Pāṇini's phonological terminology	Aṣṭādhyāyī(A)
1.	Sounds that are homogeneous with each other	<i>savarṇam</i>	A 1.1.9 and A 1.1.9
2.	Short vowel	<i>hrasvaḥ</i>	A 1.2.27
3.	Long vowel	<i>dīrgham</i>	
4.	Prolated, extra long vowel	<i>plutaḥ</i>	
5.	Duration	<i>kālah</i>	

6.	High- pitched vowel	<i>udāttaḥ</i>	A 1.2.29
7.	Low-pitched vowel	<i>anudāttaḥ</i>	A 1.2.30
8.	Combination of high and low pitched vowel	<i>svaritaḥ</i>	A 1.2.31
9.	A short vowel is also known as light vowel	<i>laghu</i>	A 1.4.10
10.	A Long vowel is also known as heavy vowel	<i>guru</i>	A 1.4.12
11.	A consonant cluster	<i>saṃyogaḥ</i>	A 1.1.7
12.	A short vowel followed by a consonant cluster is also known as heavy vowel	<i>guru</i>	A 1.4.11
13.	A set of vowels and an operation in which <i>i, u, ṛ</i> and <i>ḷ (ik)</i> vowels that replace semivowels <i>y, v, r l(yaṅ)</i>	<i>saṃprasāraṇam</i>	A 1.1.45
14.	Nasalized vowels, semivowels and nasal stops	<i>anunāsikaḥ</i>	A 1.1.8
15.	A part of an item which begins with its last vowel	<i>ṭi</i>	A 1.1.64
16.	A sound that precedes the final sound of an element.	<i>upadhā</i>	A 1.1.65
17.	The maximum drawing together of sounds in a speech flow, that is, close junction of sounds	<i>saṃhitā</i>	A 1.4.109
18.	Cessation of speech	<i>virāmaḥ</i>	A 1.4.110

In addition to these, there are also Pāṇinian terms that denote sounds according to their place of production. There are eight places of sound production as stated in the Science of Phonetics (*Pāṇinīyāsikṣā*).<sup>5</sup>

- The speech sounds located in the throat: guttural sounds(*kaṅṭhy*)
- The speech sounds located in the palatal: *palatal sounds( tālavya)*
- The speech sounds located in the teeth: dental sounds(*dantyā*)
- The speech sounds located at the root of the tongue: *jihvāmūlīya*
- The speech sounds located at the retroflex stops and ṣ : cerebral sounds(*mūrdhanya*)
- The speech sounds located at the lips : labial sounds (*oṣṭhya*)
- The speech sounds located at both nose and mouth- *Nasal(anunāsika)*

It has been noticed that the effective smallest unit of the Sanskrit writing structure can be the phoneme (*varṇa*). The range of phonemes (*Varṇamālā*) consists of Vowel Phoneme (*SvaraVarṇa*) and Consonant phoneme (*Vyañjan Varṇa*). While 'Svara Varṇa' is self-sufficient and it is not dependent on any other element, the 'Vyañjan Varṇa' however, needs an addition of 'Svara Varṇa' to compose its syllabic entity. While Vowels (*Swara Varṇa*) can be written down as syllables (*akṣara*), other syllables are the outcome of the combination of *Vyañjan Varṇa* and *Vowel Varṇa*.

### 3. Pāṇini's derivational system

Pāṇini describes Sanskrit utterance and their constituents by means of a derivational system the units of which are: bases, prefixed base elements or stems (*aṅga*: A1.4.13), affixes (*pratyaya*: A3.1.1), syntactic words (*pada*: A1.4.14) and utterances (*vākya*). Bases are of two general kinds: verbs (*dhātu*:A 1.3.1,3.1.32) and nominal bases (*prātipadika* A1.2.45-46). Nominal bases are either primitive or derived.

### 4. Pāṇini's treatment on readymade forms of words on the basis of Semantic Changes

In Sanskrit grammar, *Nipātana* is a technique adopted by *Pāṇini* to prove the authentication of some readymade form of words which violates the regular derivational process. The very innovative idea has been noticed that *Pāṇian* rules are designed in such way that sufficient examples can be collected for semantics changes.

<sup>5</sup> Giridhara Sharma Chaturveda and Parameshwara nandasharma vidyabhaskara(Ed.), (2008), *Vaiyakarasiddhāntakaumudī of Bhaṭṭojidīkṣita*, Motilal Banarasidass, ISBN:978-81-208-2347-1, Part-4, p-638 (अष्टौ स्थानानि वर्णानामुरःकण्ठः शिरस्तथा । जिह्वामूलं च दन्ताश्च नासिकोष्ठौ च तालु च ॥ पाणिनीयशिक्षा-१३)

#### 4.1 Semantic Changes due to absence of augment through aphorisms from Pāṇini's Aṣṭādhyāyī

Augments (*āgamah*) are introduced as parts of other elements in Sanskrit vocabulary. Augment is also a technical term which have major role in derivational process. Readymade forms of words are collected in this aphorism. These forms of words are restricted to represent a particular meaning in absence of augment.

##### 4.1.1 *kṣubdhasvāntadhvāntalagnamliṣṭaviribdhaphāṇṭabāḍhāni manthamanastamaḥsaktāvispaṣṭasvarānāyāsabhṛṣeṣu* (Pāṇini-7.2.18)

This is attractive that in exist of augment, meanings of the vocabulary are found changed in convention. The two words derived from the single root provide two different meaning. Semantics changes take place due to the Pāṇini's technique to prove the authentication of some readymade form of words (*nipātana*).<sup>6</sup>

Readymade form of syntactic word	Readymade form of syntactic word with meaning	Normal form of syntactic word with meaning
<i>kṣubdhaḥ (kṣub+kta)</i>	<i>kṣubdhaḥ (manthaḥ) kṣubdhā girinadī</i>	<i>kṣubhitam(kṣub+iṭ+kta)</i>
<i>svāntam (svan+kta)</i>	<i>svāntam (manaḥ)</i>	<i>svanitam(svan+iṭ+kta), svanito mṛdangah</i>
<i>dhvāntam(dhvai+kta)</i>	<i>dhvāntam (tamaḥ)</i>	<i>dhvanitaḥ(dhvai+iṭ+kta) dhvanito mṛdangah</i>
<i>lagnam(lag+kta)</i>	<i>lagnam(saktam)</i>	<i>lagitam(lag+iṭ+kta)</i>
<i>mliṣṭam (mlis+kta)</i>	<i>mliṣṭam(avispaṣṭam)</i>	<i>mlechitam(lag+iṭ+kta)</i>
<i>viribdham (rebh+kta)</i>	<i>viribdham(svaraḥ)</i>	<i>virebhitam(rebh+iṭ+kta)</i>
<i>phāṇṭam (phān+kta)</i>	<i>phāṇṭam(anāyāsah)</i>	<i>phaṇitam(phān+iṭ+kta)</i>
<i>vāḍham (vāh+kta)</i>	<i>vāḍham(bhṛṣam)</i>	<i>Vāhitam(vāh+iṭ+kta)</i>

##### 4.1.2 *kṛcchragahanayoḥ kaṣaḥ*(Pāṇini-7.2.22)

The verbal root *kaṣa* with the suffixes *kta* and *ktavatu* allow *iṭ-* augment in normal derivational process.<sup>7</sup> In accordance with Pāṇini-7.2.22, there are two readymade forms derived in absence of *iṭ-* augment conditionally for two meaning.<sup>8</sup> The two meanings are difficult (*kṛcchra*) and dense (*gahana*). The following examples are cited for this purpose.

**Example -1:** *kaṣṭam vyākaraṇam, tato 'pi kaṣṭarāṇi sāmāni.*

(Difficult grammar and more difficult the hymns of *Sāmaveda* )

**Example-2:** *kaṣṭāni vanāni. Kaṣṭāḥ parvatāḥ.*

(Forests are dense. Mountains are dense.)

With the exits of *iṭ-*augment and absence of the above mentioned two meanings, normal derivational process generates a different form of word. As a result, both the semantic and phonetics changes may be noticed from the following example.

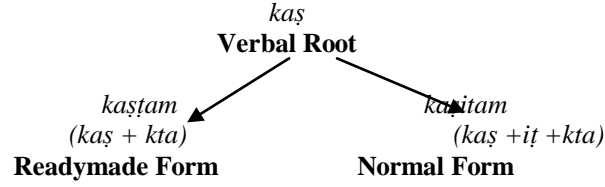
Exmple-3: *kaṣitam suvarṇam.*

(Polished Gold)

<sup>6</sup> क्षुब्धस्वान्तध्वान्तलग्नम्लिष्टविरिब्धफाण्टबाढानि मन्थमनस्तमःसक्ताविस्पष्टस्वरानायासभृशेषु (पाणिनि -७-२.१८)- क्षुब्धः - क्षुब्ध इति भवति मन्थाभिधानं चेत् । क्षुब्धो मन्थः । क्षुभितमन्यत् । क्षुब्धा गिरिनदी इत्येवमाद्युपमानाद् भविष्यति । स्वान्तम् - स्वान्तमिति मनोऽभिधानं चेत् । स्वनितमन्यत् । स्वनितो मृदङ्गः। स्वनितं मनसा । ध्वान्तम् - ध्वान्तमिति भवति तमोऽभिधानम् चेत् । ध्वनितमन्यत् । ध्वनितो मृदङ्गः । म्लिष्टम् - म्लिष्टमिति भवत्यविस्पष्टं चेत् । म्लेच्छितमन्यत् । इत्वमप्येकारस्य निपातनादेव । विरिब्धम् - विरिब्धमिति •स्वरश्चेत् । विरेभितमन्यत् । रेभृ शब्दे इत्यस्यैतद् निपातनम् । अन्ये तु विरिभितमन्यदिति पठन्ति । फाण्टम् - फाण्टमिति भवत्यनायासश्चेत् । फणितमन्यत् । यदश्रुतमपिष्टं च कषायमुदकसंपर्कमात्राद् विभक्तरसमीषदुष्णं तत् फाण्टम् । बाढम् - बाढमिति भवति भृशं चेत् । बाहितमन्यत् । बाह प्रयत्ने इत्यस्य धातोरैतद् निपातनम् । अतिशयश्च भृशमिहोच्यते । -*Kāśikāvṛtti*-7.2.18

<sup>7</sup> *ārdhadhātukasyeḍ vlādeḥ-Pāṇini-7.2.35*

<sup>8</sup> कृच्छ्र गहन इत्येतयोर्थयोः कषेर्धतोर्निष्ठायामिडागमो न भवति । कष्टोऽग्निः । कष्टं व्याकरणम् । ततोऽपि कष्टतराणि सामानि । कृच्छ्रं दुःखम्, तत्कारणमप्यग्न्यादिकं कृच्छ्रमित्युच्यते । गहने -कष्टानि वनानि । कष्टाः पर्वताः । कृच्छ्रगहनयोरिति किम्? कषितं सुवर्णम् । - कशिकावृत्तिः -७.२.२२



Neither the meaning of difficult nor the meaning of dense is expressed from the above Sanskrit word which is cited as example-3.

#### 4.1.3 bhujanyubjau pāṇyupatāpayoh(Pāṇini-7.3.61)

The Sanskrit word 'bhujah' and 'nyubjah' are not shaped through normal derivational process. These two words are designed only to express the meaning respectively 'hand' and 'diseases'. Following to the normal derivational process the word 'bhujah' will be replaced by 'bhogah' and also 'nyubjah' will be replaced by 'samudgah'. In accordance with Pāṇini-7.3.61, the semantic base (pāṇyupatāpayoh) is the only clause to generate two different words in Sanskrit. As a result, both the semantic and phonetics changes are experienced from the following readymade form of examples.<sup>9</sup>

Example	Derivational process	Readymade form of word	Normal form of word
1	bhuj (verbal root)+ ghaṅ (affix)	bhujah (hand)	bhogah (enjoyment)
2	ni(prefix)+Ubj(verbal root)+ ghaṅ(affix)	nyubjah (diseases)	samudgah

#### 5. Phonetics Changes due to Optional Rules

The following Pāṇinian rules (śūtras) serve optionally to change consonants in given contexts.

##### 5.1 anusvārasya yayi parasavarṇah (Pāṇini-8.4.58)

The nasal off glide ṁ (anusvārah) is replaced by a sound homogeneous with the following one (parasavarṇah) when it occurs before a semivowels or stop (yayi).<sup>10</sup> The following examples are cited herewith to examine the phonetics changes.

- शङ्किता, शङ्कितुम्, शङ्कितव्यम् (śaṅkitā, śaṅkitum, śaṅkitavyam)
- उञ्चिता, उञ्चितुम्, उञ्चितव्यम् (uñcitā, uñciturum, uñcitavyam)
- कुण्डिता, कुण्डितुम्, कुण्डितव्यम् (kuṇḍitā, kuṇḍitum, kuṇḍitavyam)
- नन्दिता, नन्दितुम्, नन्दितव्यम् (nanditā, nanditum, nanditavyam)
- कम्पिता, कम्पितुम्, कम्पितव्यम् (kampitā, kampitum, kampitavyam)

##### 5.2 vā padāntasya(Pāṇini-8.4.59)

According to the previous statement of Pāṇini nasal sound ṁ (anusvārah) is replaced by a sound homogeneous with the following one (parasavarṇah) when it occurs before a semivowels or stop (yayi), but this substitution applies only optionally (vā) to pada-final (padāntasya) ṁ.

तङ् कथञ् चित्रपक्षण् डयमानन् नभःस्थम् पुरुषोऽवधीत् ।

( taṅ kathñ citrapakṣaṅ ḍayamānan nabhaṣṭham puruṣo 'vadhīt.)

तं कथं चित्रपक्षं डयमानं नभस्थं पुरुषोऽवधीत् ।

( tam katham citrapakṣam ḍayamānam nabhaṣṭham puruṣo 'vadhīt.)

##### 5.3 jhayo ho'nyatarasyām(Pāṇini-8.4.62)

h (haḥ) is optionally(anyatarasyām) replaced by a sound homogeneous with a preceding non-nasal stop (jhayah).<sup>11</sup>

<sup>9</sup> भुज न्युब्ज इत्येतौ शब्दौ निपात्यते पाणावुपतापे च । भुज्यतेऽनेनेति भुजः पाणिः । हलश्च(३.३.१२१) इति घञ् । तत्र कुत्वाभावो गुणाभावश्च निपात्यते । उब्ज आर्जवे(तुदा.२०) न्युब्जिताः शेरतेऽस्मिन्निति न्युब्ज उपतापो रोगः । तथैव घञि कुत्वाभावो निपात्यते । पाण्युपतापयोरिति किम् ? भोगः । समुद्गः । -Kāśikāvṛtti -7.3.61

<sup>10</sup> अनुस्वारस्य ययि परतः परसवर्ण आदेशो भवति ।- काशिकावृत्तिः- ८.४.५८

<sup>11</sup> झय उत्तरस्य हकारस्य पूर्वसवर्णादेशो भवत्यन्यतरस्याम् । -काशिकावृत्तिः- ८.४.६२

- वाग्घसति । वाग् हसति । (*vāgghasati / vāg hasati*)
- श्वलिङ् ढसति । श्वलिङ् हसति । (*śvaliṅghasati/ śvaliṅh hasati*)
- अग्निचिद्घसति । अग्निचित् हसति । (*agnicidghasati /agnicit hasati*)
- सोमसुद्घसति । सोमसुत् हसति । (*somasudghasati/ somasut hasati*)
- त्रिष्टुब्भसति । त्रिष्टुब् हसति । (*triṣṭubbhasati/ triṣṭub hasati*)

#### 5.4 śāscho'ṭi (Pāṇini-8.4.63)

Following a non-nasal stop, ś(*śah*) is optionally replaced by 'ch', provided it occurs a vowel or a semivowel other than 'l' (*aṭi*).<sup>12</sup>

- वाक्छेते । वाक् शेते । (*vākchete/ vāk ṣete*)
- अग्निचिच्छेते । अग्निचित् शेते । (*agnicicchete/ agnicit ṣete*)
- सोमसुच्छेते । सोमसुत् शेते । (*somasucchete/ somasut ṣete*)
- श्वलिङ्छेते । श्वलिङ् शेते । (*śvaliṅchete/ śvaliṅ ṣete*)
- त्रिष्टुप्छेते । त्रिष्टुप् शेते । (*triṣṭupchete/ triṣṭup ṣete*)

### 6.0 Phonetics changes due to the deletion of consonant through Pāṇinian rules

The deletion of phoneme is a major cause for phonetics changes in the study of the science of language.<sup>13</sup> Pāṇini operates with zero and recognizes particular zero replacement that have different effects. According to A.1.1.60 (*adarśanam lopaḥ*) zero in general (*adarśanam*) not being perceived, that is not occurring is called *lopa*. Deletion of phoneme or a consonant is also caused phonetic changes in Sanskrit. The following Pāṇinian rules serve optionally to delete consonants in given contexts.

#### 6.1 halo yamām yami lopaḥ(Pāṇini-8.4.64)

Zero (*lopaḥ*) optionally replaces a semivowels or nasal (*yamām*) which occurs after a consonant (*halah*) and is followed by a semivowels or nasal (*yami*).<sup>14</sup> Phonetic changes may be experienced from the following examples in Sanskrit.

- As the middle *y*-phoneme is optionally deleted, there are two forms of words used in Sanskrit: *śayyā* (शय्या) and *śayyyā* (शय्य्या). The two sanskrit words represent equally the meaning of 'bed' in english.
- Similarly, due to the optional operation of Pāṇinian rule, there are two forms of words use in Sanskrit: *ādityaḥ* (आदित्यः) and *ādityyaḥ* (आदित्य्यः) The two sanskrit words represent equally the meaning of 'sun' in english.

The pronunciation of the above words in Sanskrit are found not equivalent, but are in equal meaning.

#### 6.2 jharo jhari savarṇe (Pāṇini-8.4.65)

This Pāṇinian rule (*sūtra*) applies deletion to a non-nasal stop or a voiceless spirant (*jhari*) which follows a consonant and occurs before a homogeneous (*savarṇe*) non-nasal stop or voiceless spirant (*jhari*).

For example: प्रदत्तः -*pra-dt-taḥ* (अच उपसर्गात् तः - 7.4.47), प्रदत्तः -*pra-tt-taḥ* (खरि च - 8.4.55), प्रतः - *prattaḥ* 'presented'. The sound 'd' (द) is deleted here by the rule "jharo jhari savarṇe". The Sanskrit word *prattaḥ* (प्रतः) means 'presented' in English. Deletion of consonant is caused phonetics change in Sanskrit.

## II. CONCLUSION

The appliance of Pāṇian sound catalog as discussed above evident that the Sanskrit Language is one of the best resource in the research world to undertake a study on phonetics. Pāṇini's grammar is universally accepted for its insightful analysis of Sanskrit. The present study may help to scrutiny the grammatical examples cited throughout the derivational process adopted in *Aṣṭādhyāyī*. In addition, some of its features have a more specialized in phonetics. Sanskrit Researchers reward the completeness of its descriptive coverage of the spoken standard language (*bhāṣā*) of Pāṇini's time, and the often unique information it provides on Vedic, regional and even sociolinguistic usage. The present study may also to collect ideas of modern linguistic theory in Sanskrit.

<sup>12</sup> झय उत्तरस्य शकारस्याटि परतश्छकारादेशो भवत्यन्यतरस्याम् ।- काशिकावृत्तिः-८.४.६३

<sup>13</sup> वर्णागमो वर्णविपर्ययश्च द्वौ चापरौ वर्णविकारनाशौ । धातोस्तदर्थतिशयेन योगस्तदुच्यते पञ्चविधं निरुक्तम् ॥- पृषोदरादीनि यथोपदिष्टम्, काशिकावृत्तिः(६.३.१०९)

<sup>14</sup> हल उत्तरेषां यमां यमि परतो लोपो भवत्यन्यतरस्याम् ।-काशिकावृत्तिः-८.४.६४

Regular chanting and practice of Sanskrit words with correct pronunciation may be treated as therapy to the speech mechanism of human body. As we know, all our major Indian Languages abound in vocabulary directly drawn or derived from Sanskrit. It is remarkable that we find many of them prevalent also in foreign languages. Although a meticulous study would be more informative, a brief discussion only is presented through this paper by way of illustration.

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Dr. Dharmendra Das. "Relevance of Pāṇini's sound catalog and it's appliance in language study." *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, 27(02), 2022, pp. 46-53.