Description of vowel in the first grammatical work of Tamil and Arabic: A contrastive analysis

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Abstract

Tolkāppiyam and Al-Kitāb, these two grammatical texts are belonging to two different languages Tamil and Arabic. Tamil is a Dravidian family and Arabic is a Semitic family with different writing systems (Tamil-left to right; Arabic-right to left). These two grammatical texts are written in different historical period, Tolkāppiyam written in BC 300 and Al-Kitāb written in AD 800. Both are describes the vowels of respective language through different phonetic features. The main aim of this paper is to evaluate and analyze the articulatory treatment of vowels in the perspective of first grammatical work of respective languages. The first section of the paper is evaluating the articulatory treatment, theory, classification and phonetic frameworks of vowels in respective grammars, and the second section analyzing in contrastive and describes the commonness and differences between these two texts. This section finds out the commonness in the following features: articulatory treatment, descriptive and use of technical terms etc. The differences are found in the following features: order of the description of speech sounds, method of classification of vowels etc.

Keywords: Al-Kitāb, Arabic vowels, Classification of vowels, Sībawayhi, Tamil vowels, Tolkāppiyam, Tolkāppiyar.

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A. Introduction

Tolkāppiyam and other Indian descriptive grammars (Kātantra, AD.100; Kaceiyanam, AD.700 etc.) generally describes the grammatical features with a treatment of phonology at the beginning. Also western descriptive linguistics usually starts the description of language with phonology. It is only the Kitāb treats the phonology in the last (Syntax – Morphology – Morphophonemic – Phonology). The reason is that it considered necessary to examine the larger units such as words and phrases first and then to discuss the smaller segments of speech. There is different in the arrangement of phonology also. Tolkāppiyam describes the primary sounds (phone) in the order of vowels and then consonants; but the Kitāb describes in the reverse order, consonants first and then vowels. Tolkāppiyar’s (Author of Tolkāppiyam) observations of phonetics found in first three chapters Nūmarapu (Tolkāppiyam-Eḻuttatikāram/ Tol. Elu.1-33), Moḻimarapu (Tol.Elu.34-82), Piṟappiyal (Tol.Elu.83-102). Sībawayhi’s (Author of Al-Kitāb) observations of phonetics found in last seven chapters (ch.565-571). These two traditional grammarians describe the articulatory processes of the vowels and consonants in their respective grammars. Both are allotted separate chapters for the articulatory processes of the sounds. Tolkāppiyar describes the articulatory processes of vowels and consonants in the chapter of Piṟappiyal. Sībawayh describes articulatory processes of vowels and consonants in the chapter of 565 (Hārūn Edition of Al-Kitāb/ HE.,vol.4,pp.431-436).

2Michael G Carter. Sībawayhi, 2004, p.120.

B. Discussion

1. The Articulatory treatment of vowels in Tolkāppiyam and Al-Kitāb

Tolkāppiyar describes all cardinal vowels of Tamil. He followed traditional (standard) alphabetical order in his vowel description, and describes the points and manners of articulation systematically. Before, enter into the description of the points and manners of articulation of the sounds, he describes the general features (air chambers and articulators) of the speech production. In the beginning of third Chapter (piṟappiyal), he explains the general features of the speech production in the first nūṟṟa/sūtrā (Tol.Elu.83) and defines the basic aspects of the manner of articulation of the vowels in second nūṟṟa (Tol.Elu.84). Tolkāppiyar says that the general features of the articulation of the vowels following, “All the twelve vowels, without changing their quality, are uttered with the air passing through the throat” (Tol.Elu.84). Other Tamil grammarians never mentioned this (general) feature of the vowels. Then, Tolkāppiyar classifies the manner of articulation of vowels in three ways. They are:

a. Oral (buccal) cavity / airy (Mid vowels)

b. Front-back variation of tongue (Front vowels)

c. Lip position (Back vowels)

a. Oral (buccal) cavity / airy:

Tolkāppiyar defines this manner of articulation for [a,aː]
a ā āyiran tarikān tiyalum (அஆஆயிரண்டங்காந்தியலும்)
- Tol.E 7u.85

[a,aː] those two, are uttered by opening the mouth.

b. Front-back variation of tongue:

Tolkāppiyar lists the five vowels in this manner of articulation that [i, iː, e, eː and ai]
i i e e ai ena icaikkum appāl aintum avarrō ranna avaitām, anpal mutualnā vilimpuural utaiya

அஆஆயிரண்டங்காந்

இசைக்கும் (இ�எஏஐயரன்)
- Tol.E 7u.86

The five vowels [i, iː, e, eː and ai] pronounced in the same way (opening the mouth) as the edges of the front of the tongue touch the teeth ridge.

c. Lip position:

Tolkāppiyar’s mention the manner of articulation of the five vowels [u,uː,o,oː,au] as following:

u ū o ō au eṉa icaikkum appāl aintum itaḻkuvin tiyalum

இசைக்கும் (இசைக்கும்)

- Tol.E 7u.87

The five sounds [u, uː, o, oː, au] are pronounced by rounding the lips.

All the later Tamil grammarians followed this classification of manner of articulation. Pavananti muṇivar (Author of Nāṇnul, AD.1300), Vaittiyanātā tēcikar (Author of Ilakkaṇāvīlakkam, AD.1700) and Muttuvirā upāṭiyāyār (Author of Muttuviriyam, AD.1900) are repeated Tolkāppiyar’s definition (aṅkappu, anpal mutualnā vilimpuṟal, itaḻkuvivu) of the vowels as following:

aṅkappu (opening the mouth) for [a, a : ] (Tol.E 7u.85).

Nāṇnul 76, Ilakkaṇāvīlakkam 11, Muttuviriyam 44.

anpal mutualnā vilimpuṟal (the edges of the front of the tongue touch the teeth ridge) for [i, i : , e, e :,ai] (Tol. E 7u.86).

Nāṇnul 77, Ilakkaṇāvīlakkam 11, Muttuviriyam 45.

itaḻkuvivu (rounding the lips) for [u, u : , o, o : , au] (Tol.E 7u.87).

Nāṇnul 78, Ilakkaṇāvīlakkam 11, Muttuviriyam 46.

In the vowel description Tolkāppiyar does not define all manner of articulation of vowels. He only mentions the major features of the vowels. The manner of oral cavity (aṅkappu) is a main feature of the in the [a,aː], front-back variation of tongue (anpal mutualnā vilimpuṟal) is major feature in the pronunciation of [i,iː,e,eː,ai] and the lip position (itaḻkuvivu) is major feature of [u,uː,o,oː,au]. Tolkāppiyar mentions only these three major features of the manner of articulation for vowels.

Siṃbawayh describes only the long
vowels of Arabic. He mentions the sounds in phonetic alphabetic order (basis points of articulation of sounds). In the chapter 565, first he mentions twenty nine primary sounds of Arabic and then describes the points of articulation and classification of consonants. At last, he mentions classification and articulatory processes of vowels briefly (only eight lines in HE., vol.4, p.435,436). After the classification of ‘tight’ and ‘slack’ consonants, he describes articulatory processes of vowels. In the description of vowels, first he classifies the vowels (soft and prolongation) and then defines the manner of articulation. 

The early Arabic linguists seem to have not always organized their work systematically. They mingle different things together, and introduce the same points in more than one place. It is therefore normal to find a phenomenon being discussed in great detail, although no separate chapter is devoted to it.  

The vowel is one of these, especially the short vowel. Because they believe that a long vowel and its corresponding short vowel are the same except in duration, they appear to find it unnecessary to discuss the short vowels separately. And they does not discuss orderly, like Tolkappiyar.

Arabic has six primary vowels, namely \[a,i,u,aː,iː,uː\] but Sibawayh does not discuss three short vowels. He gives status to their long counterparts only. He does not consider the short vowels as full sounds but as a part of long vowels. Sibawayh states that the short vowels, “all the short vowels are from the long vowels” (HE., vol.4, p.335), so he describes the articulatory processes only for long vowels.

Sibawayh’s categorizes the manner of articulation of Arabic long vowels in three ways.

a. Lip position (Back vowels)

b. Tongue height (Front vowels)

c. Oral (buccal) cavity / airy (Mid vowels)

a. Lip position: You may round your lips in the Wāw \[uː\].

لأنك قد تَضم شَفَتَيْك فى الواو

b. Tongue height: Raise your tongue towards the palate in the Ya\[iː\].

وترفع فى الياء لسانك قِبَل الحَنَك

c. Oral (buccal) cavity / airy: Sibawayh defines the points of articulation of middle vowel \[aː\] in airy, he calls the \[aː\] as al-hā-wi (الهاوى). It means airy sound.

1. Tolkāppiyar’s theory in the treatment of vowels

Tolkāppiyar describes the phonetic features of vowels in three ways, a. Classification, b. List/order and c. Manner of articulation. After the list of primary and secondary sounds, mention
the classification of vowels as short and long on the basis of time duration. He explains the short and long vowels in following methods:

a. Classification of vowels (Tol.ELYu.3,4)
   Name of the sounds \([a i u e o / a: i: u: e: ai o: au]\)
   Total number of the sounds \((aintum / ēţum)\)
   Time duration of the sounds \((ōrālappu / Īrālappu)\)
   Category of the sounds \((kurreluttu / netṭeluttu)\)
   Quotation \((eṉpa)\)

   Tolkāppiyar uses the same method and order in the description of both short and long vowels. First, he enumerate the name of sounds \([a i u e o / a: i: u: e: ai o: au]\) and mention the total number \((aintum / ēţum)\) and then gives the duration (mātra), \((ōrālappu / Īrālappu)\) and then classifies that as short and long \((kurreluttu / netṭeluttu)\) based on the formulation of early allies \((eṉpa)\).

b. List of vowels (Tol.ELYu.8)
   Last sound \((au)\) of the vowels in standard alphabetical order \((aukāra)\)
   Total sounds in number \((pānṇireluttum)\)
   Category of the sound \((uviṟṇa)\)
   Quotation \((Moḻipa)\)

   First, he mentions the last sound of the vowel list \(au\) \((aukāra iḻuvāyp)\), then he counts all the sounds of this group in number as twelve \((pānṇireluttum)\), then he classifies the vowel \((uviṟ)\) and last, he makes it a quote as “Moḻipa”. He followed standard alphabetical order. Till \(au\) (last vowel), \(aukāra iḻuvāyp\) it means all the vowels (starting with \(a\) and ending with \(au\)), this method of description was found in only Tolkāppiyam. Tolkāppiyar used this method in both the order of enumeration of vowels (Tol.ELYu.8) and consonants (Tol.ELYu.9).

d. Manner of articulation of vowels (Tol.ELYu.84-88)
   Name of the sounds \([a a: / i i: e e: ai o: o: au]\)
   Total number of the sounds \((āyiraṇṭ / aintum)\)
   Manner of articulation \((aṅkappu / aṅpal mutalnā vïṟimpuṟčal / itaḻkuvivu)\)

   Tolkāppiyar uses the same method in the description of the manner of the all vowels. First, he enumerates the sounds, then sums them in number and last defines the manner of articulation.

   Tolkāppiyar followed the standard method in the description of vowels. He deliberates the vowels in the following order: List of sounds, Numbering and explanation. Both of the classification and enumeration of the vowels are not his formulation, but it was followed already in Tamil linguistic tradition. The use of quetative particle “eṉpa”, “Moḻipa” indicate it may be his own formulation.

2. Sibawayh’s theory in the treatment of vowels
Sibawayh describes the phonetic features of the vowels in four ways. They:

a. Common manner of articulation of vowels (HE.,vol.4,p.176)

b. Genetic relationship between the short and long vowels (HE.,vol.4,p.242)

c. Classification of vowels (HE.,vol.4,p.435)

d. Exact manner of articulation of each vowel (HE.,vol.4,p.436)

Sibawayh does not mention the treatment systematically and also does not follow any standard order in the vowel description.

3. Classification of vowels

Tolkāppiyar describes the all vowels of Tamil (Tol.Eḻu.8) and he classifies them into two categories as short and long on basis of time duration (Tol.Eḻu.3). He lists the short vowels as five \([a,i,u,e,o]\) the long vowels as seven \([aː,iː,uː,eː,oː]\) respectively and he calls them *kurreluttu* and *neṭṭeluttu*. In the list of long sounds, \(ai\) and \(au\) are diphthongs.\(^4\) Tolkāppiyar describes the diphthong in the following sūtrā, “akara ikara m-aikāramākum” \([a + i = ai]\) and “akara ukara maikāramākum” \([a + u = au]\) (Tol.Eḻu.54, 55). Tolkāppiyar define the two secondary sounds (allophone) (Tol.Eḻu.2), shortened \(i\) (kurriyal-ikaram) and shortened \(û\) (kurriyal-ukaram) and he does not include it in the list of vowel.

<table>
<thead>
<tr>
<th>Table 1. Tolkāppiyar’s classification of vowels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Un-identifiable classification</td>
</tr>
<tr>
<td>---------------------------------</td>
</tr>
<tr>
<td>Primary vowels</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Secondary vowels (Allophones)</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Tolkäppiyar classifies the vowels as short and long on the basis of time duration. He defines the time duration "oralapu" (one māttirai) for short vowels and "iralapu" (two māttirai) for long vowels. First he explains the short vowels and then long vowels (Tol. Elu.3,4). He classifies the vowels based on their time duration.

Sibawayh divides the long vowels into two groups: first, the open vowel and second the close vowel. The open vowel is formed with wide mouth opening, where the distance between the tongue and the roof of the mouth is great. This is the case with the long vowel \([a:]\), and he considers it to be short counterpart \([a]\). Second, the close vowel is formed with narrow mouth opening. This is the case with both \([i:]\) and \([u:]\) and their counterparts \([i]\) and \([u]\). He realizes more specifically that the sound \([i:]\) is more open than \([u:]\) and less than \([a:]\), but it is more close to \([u]\) than to \([a:]\). In the case of the shape of the lips, the only primary rounded vowel is \([u:\] and its counterpart \([u]\). Other vowels are unrounded. Al-Khalil views that the short vowels is actually a part of long vowels. Sibawayh stresses this here.  

**Table 2. Sibawayh’s classification of vowels**

<table>
<thead>
<tr>
<th>Classification</th>
<th>a:</th>
<th>i:</th>
<th>u:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Softness (layyina)</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>2 Prolongation (madd)</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

4. **Phonetics framework of vowels**

Tolkäppiyar describes the vowels in three aspects, the manner of articulation (common manner; oral cavity, lip position, front-back variation of tongue), duration of vowels (Mātrā) (short and long) and the combination of vowels (diphthongs).

**Table 3 Tamil vowels in Tolkäppiyar Phonetics Framework**

<table>
<thead>
<tr>
<th>Serial no.</th>
<th>Tamil symbols</th>
<th>IPA equivalents</th>
<th>Phonetic values</th>
<th>Articulatory features</th>
<th>Length (Mātrā)</th>
<th>Diphthongs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>அ  அ  அ</td>
<td>a</td>
<td>a</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>2</td>
<td>ஆ  ஆ  ஆ</td>
<td>a:</td>
<td>å</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>இ  இ  இ</td>
<td>i</td>
<td>i</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

Siabawayh describes the vowels in three aspects, manner of articulation (lip position, tongue height, oral cavity), classification of vowel (softness and prolongation) and genetic relationship between the short and long vowels.

Table 4 Arabic vowels in Siabawayh Phonetics Framework

<table>
<thead>
<tr>
<th>Serial no.</th>
<th>Arabic symbols</th>
<th>IPA equivalents</th>
<th>Phonetic values</th>
<th>Articulatory features</th>
<th>Length (Mātrak)</th>
<th>Genetic relationship between the short and long vowels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Voiced</td>
<td>Lip position</td>
<td>Tongue height</td>
</tr>
<tr>
<td>1</td>
<td>a</td>
<td>a</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>i</td>
<td>i</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>u</td>
<td>u</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>a:</td>
<td>á</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>5</td>
<td>ñ</td>
<td>ñ</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>ū</td>
<td>ū</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
5. **Commonness in the articulatory treatments**

a. Tolkëppiyar and Sibawayh both are categorized the manner of articulation of vowels in three ways.

<table>
<thead>
<tr>
<th>Tolkëppiyar:</th>
<th>Sibawayh:</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Oral (buccal) cavity / airy (Mid vowels)</td>
<td>i. Lip position (Back vowels)</td>
</tr>
<tr>
<td>ii. Front-back variation of tongue (Front vowels)</td>
<td>ii. Tongue height (Front vowels)</td>
</tr>
<tr>
<td>iii. Lip position (Back vowels)</td>
<td>iii. Oral(buccal) cavity/airy (Mid vowels)</td>
</tr>
</tbody>
</table>

Tolkëppiyar and Sibawayh both are define the manner of articulation for mid vowels and back vowels similarly. In the manner of articulation of front vowels, Tolkëppiyar remarks front-back variation of tongue and Sibawayh remarks tongue height, also modern phonetician considers these features of manner for the front vowels. They (Tolkëppiyar and Sibawayh) describe these three categories in different order.

b. Tolkëppiyar describes only the major features of the manners of vowels and he considers all the other features additionally. Sibawayh also use same technique (he describes only the major features of manner of articulation of vowels) to describe the articulatory processes of vowels. It is displayed in the table 5.

**Table 5. Major and Additional features of vowels by Tolkëppiyar and Sibawayh**

<table>
<thead>
<tr>
<th>Articulatory features of vowels</th>
<th>Tolkëppiyar</th>
<th>Vowels</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Major features</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Tongue height</td>
<td>-</td>
<td>+ [i]</td>
</tr>
<tr>
<td>2 Front-back variations of tongue</td>
<td>+</td>
<td>- [i,i:,e,e:,ai]</td>
</tr>
<tr>
<td>3 Lip position</td>
<td>+</td>
<td>+ [u,u:,o,o:,au]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[u:] (Sib.)</td>
</tr>
<tr>
<td>4 Oral cavity / airy</td>
<td>+</td>
<td>+ [a,a:]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[a:] (Sib.)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Additional features</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Nasalized</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2 Advanced Tongue root</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3 Tense /Lax</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4 Pharyngealized vowel</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5 Strident</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6 Rhotic vowels</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>7 Fricative</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>8 Phonation</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>9 Length</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>10 Diphthongs</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>
Both are consider mainly the major features of the vowels, tongue height, front-back variations, lip position and the position of oral cavity. They consider also phonation, length and diphthong as additional features of vowels.

c. Tolkāppiyar and Sibawayh both are consider the vowels are voiced. Tolkāppiyar stated for this sense as, \(\text{avvaḻip} / \text{Paṉṉī ruvīrīm tannilai tiriya} / \text{Miṭāṟṟup pīṟanta valiyiṉ icaikkum} \) “All the twelve vowels, without changing their quality, are uttered with the air passing through the throat”.

7. Commonness in techniques

a. Tolkāppiyar and Sibawayh both are enumerate the sounds and mention total in numbers.

Tolkāppiyar and Sibawayh not only describe the manner of articulation of the vowels, but also enumerate the sounds and their total number.

\(āyiraṇṭu\) [two] (Tol.E.lu.85), \(appāl aıntum\) [five] (Tol.E.lu.3, 86, 87), \(appāl ḍum\) [seven] (Tol.E.lu.4) and \(panṇireḻuttum\) [twelve sounds] (Tol. E.lu.8). No other Tamil grammarian used this method of description. Sibawayh also enumerates the sounds and gives the total in number at all places of listing, for example, ُ\(\text{فأصل حروف العربية} \) "تسعة وعشرون حرف [Twenty-nine basic sounds of Arabic] (HE.,vol.4,p.431).

b. Both of them do not used particular term for speech sound.

Tolkāppiyar use the term \(eḻuttu\) (எழுத்து) for speech sound and he used the same term for the following senses phone, phoneme and grapheme. Most of the places he use this in the sense of phoneme. Sibawayh used the term ḥarf (حرف) as a speech sound. This term is also used in the Kitāb for concepts such as, phone, phoneme, grapheme, syllable, particle, word and hamza (a glottal stop). In the Qur’an it is used to mean dialect. In modern times both of these two terms, \(eḻuttu\) and ḥarf means the same letter in respective languages.

c. Using the technical terms in the classification of vowels:

Both of them used technical terms for short and long vowels. Tolkāppiyar classifies all short vowels are \(Kuṟṟ\)eḻuttu and long vowels are \(Neṭṭ\)eḻuttu. Sibawayh describes only three long vowels and he classifies them into two categories soft and prolongation. He termed \(Līn\) for soft vowels and \(Madd/ Hāwī\) for prolongation. The technical term of prolongation (Madd) is similar to Tolkāppiyar’s \(Neṭṭ\)eḻuttu. The terms \(Neṭṭ\)eḻuttu and Madd literally similar.

8. Differences in the order of description

a. Order of the treatment of language

Both of them describe the data in the target language in following order:

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6 A.A.Al-Nassir, Sibawayhi the Phonologist: A critical study of the phonetics and phonological theory as presented in his treatise Al-Kitab,1993,p.10.
7 Ibid.
Tolkāppiyar: Phonology – Phonetics – Morphophonemic – Morphology – Syntax – Semantics
Sibawayh: Syntax – Morphology – Morphophonemic – Phonetics – Phonology

b. The order of the treatment of speech sounds

Tolkāppiyar: Vowel – Consonant – Allophone.

Tolkāppiyar describes the points and manners of articulation systematically. He classifies the speech sounds clearly as primary and secondary. In the primary sounds, first he explains the manners of articulation of the twelve vowels and then he describes the details of points and manners of articulation of the eighteen consonants and the last he defines the points and manners of articulation of three secondary sounds. All the later Tamil grammarians follow the same method of description (vowel-consonant-allophone). They are describing the following order: vowels, consonants and secondary sounds. Tolkāppiyar followed this order in the enumeration of sounds (Tol. Eļu.1), time duration (Tol.Eļu.3,4,11), classification of sounds (Tol.Eļu.8,9) and articulatory processes of the sounds (Tol.Eļu.85-101).

Sibawayh describes the Arabic sounds in opposite order; he also classifies the speech sounds as primary and secondary, but he does not classify primary sounds clearly like Tolkāppiyar. Sibawayh does not follow any standard order. So, he discusses the sounds in the following order: consonant (HE.,vol.4,p.431) – allophone (HE.vol.4, p.432) – consonant (HE.,vol.4,pp.433-436) – vowel (HE.,vol.4,p.436) – consonant (HE.,vol.4,p.436).

c. The order of vowel treatment

Tolkāppiyar:
Classification of the vowels on the basis of time duration (Tol. Eļu.3,4)
List of total vowels (Tol.Eļu.8)
General manner of articulation of the vowels (Tol.Eļu.84)
Manner of articulation of the vowels (Tol.Eļu.85,86,87)

Sibawayh:
Sibawayh does not follow any standard method in description of vowels. In the articulatory treatment of vowels (HE.,vol.4,p.435-436), Sibawayh intermingle with manner and classification. He mentions the vowel features in following order: general manner, exact manner of each vowel and the last, he repeats the general manner of three vowels.

9. Differences in theories and techniques

a. Theory of vowel description

Tolkāppiyar describes the vowels systematically in all the places of
vowel description.

In the list of vowels (Tol.Eḻu.8)

Last sound of the vowel in standard alphabet order (aukāra)

Total sounds in number (panṇireḻuttum)

Category of the sound (uyireṇa)

First, he mentions the last vowel au in the standard alphabetical order; he mentions shortly aukāra iṟuvāy, which means end with au. Then he gives the total number.

Indian grammarians are used sūtra style description of language; also there are Meta grammatical conventions (like ukti) in the composition of grammatical works. But Arab grammarians follow prose style to describe the language. Sibawayh does not follow any standard method in vowel description. In the description of common manner of articulation of the vowels, first he mentions the vowels and then gives the general feature of manner of articulation.

In the description of exact manner of articulation of vowels, first he mentions the exact manner of articulation of each vowel and then gives the respective vowels. In repeated common manner of vowel description (last line of vowel description) (HE.,vol.4,p.436), first he mention the total number of vowels (as three),then gives common manner (as airy) and the last mention all (three) vowels (as a: i: u:).

b. Concepts of vowel classification

Tolkāppiyar: basis short vowels and time duration.

Sibawayh: basis long vowels and time duration.

Tolkāppiyar classifies the vowels short and long based on time duration. ṭoralu (one māttirai) for short vowels and ṭoralu (two māttirai) for long vowels. First he defines the short vowels and then long vowels (Tol. Eḻu.3,85,86,87).

Sibawayh gives only three long vowels and does not give the three correspondence short vowels. He does not consider short vowels as full sounds, but as part of the long vowels. Later Arab grammarian Ibn Jinni also calls the short vowels as aṣwāt nāqīṣah (incomplete sounds). A short vowel is a part of long vowel it’s the vowel concept of Sibawayh. It is probable that this attitude has influenced by the alphabetical system of Arabic, which does not include characters for the short vowels. But, both are (Tolkāppiyar and Sibawayh) indicated the time duration is main difference between short and long vowels. Tolkāppiyar defines time duration (māttirai) of the vowels very clearly in nūṭpas/sūtras 3, 4 and 5. Sibawayh does not mention time duration of the vowels openly.

3. Tolkāppiyar and Sibawayh both identify the vowels are voiced. Sibawayh calls voiced sounds as Majhūr and unvoiced as Māhmūs. Tolkāppiyar does not use any technical terms for voiced and unvoiced.

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8 A.A.Al-Nassir, Sibawayhi the Phonologist: A critical study of the phonetics and phonological theory as presented in his treatise Al-Kitab,1993,p.29.
A. Conclusion

Tolkappiyar’s description of Tamil phonetics is authentically as opined by Panampāranar, “Produced the phonemic features with no disorder” (Mayankā marapiṅ ēṭuttumurai kāṭṭi /பணம்பாரனர் மறறத்துண்டுமையை காட்டி). In the description of vowels, Tolkāppiyar divides the vowels (Tol.Ēlu.3 and 4) as short and long and then he mention the list of vowels (Tol.Ēlu.8). He changes this order in the description of consonants. Here, first he mention the list of consonants (Tol.Ēlu.9) and then he divides the consonants (Tol. Ėlu.19,20 and 21) as stop (Valleḻuttu) nasal (Melleḻuttu) and others (fricative, lateral etc.) (Itaiyeḻuttu). He gives the total number of sounds in the classification of vowels, does not follow this method in the classification of consonants. The list of sounds and the classifications are followed from Tamil linguistic tradition, but the points and manners of articulation of sounds are defined by Tolkāppiyar from his own knowledge. Tolkāppiyar not only describes the points and manners of articulation, also gives the total numbers of sounds as, āyirāṭu, appāl aintum etc. This method is very useful to verify the sounds. Sībawayh does not speak about articulatory strength in his investigation of the vowels in context. Instead he deals with the ease of articulation of these vowels. He considers the open vowels are easiest to articulate, the front vowels less easy, and the back vowels least easy (HE.,vol.4,pp.119,167). This classification seems to be phonetically based, since the tongue is least involved in producing the open vowels, more involved in producing the front vowels and both the tongue and the lips are involved in producing the back rounded vowels. The true semi-vowels are [w] and [y], with [ā] dealt with separately and termed hāwī, because it is a completely open sound, unlike [w] and [y], which involve some construction by the lips and tongue respectively. Sībawayh discussed vowels in conjunction with consonants in respect of the place of articulation. He considers vowels are voiced.

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