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**PHONOLOGICAL ADAPTATION OF
CONSONANTAL SEGMENTS IN ARABIC
LOANWORDS IN MALAYALAM: A CASE STUDY
OF THE MAPPILA DIALECT IN NORTH KERALA**

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ABSTRACT

When foreign words are borrowed into a language, they undergo some changes to conform to or suit the phonology of the borrowing language. They may undergo substitution, deletion, or insertion of segments during borrowing. This study looks at the Arabic loanwords in the Mappila dialect of Malayalam. The paper examines the Arabic loanwords elicited in Malayalam, employing Danesi's Integrated Model of Loanword Nativisation as the conceptual framework. It is observed that the Arabic segments in the borrowed words, especially those not present in Malayalam, undergo minimal changes during the adaptation process. These processes are normally triggered by some constraints operating in the borrowing language. The study shows that there is a significant degree of regularity in the adaptations of these loanwords. The paper also emphasizes that loanword adaptation is more phonological than phonetic. The borrowers correctly identify the foreign phonological segments in the loanwords and adapt them to suit their native phonology. The discerned high degree of regularity in loanword adaptations, with infrequent irregularities stemming from non-phonological factors, contributes valuable insights into the phonological dynamics of the borrowing language.

Keywords: Loanword Adaptation, Phonological Constraints, Malayalam, Arabic Loanwords, Mappila Dialect

1. Introduction

Loanwords are lexical items borrowed from one language (donor language) and incorporated into the lexicon of another language (borrowing language or recipient language). This process of borrowing linguistic items typically occurs when two languages are in contact either geographically or through their speakers. Campbell (2013) identifies two reasons for lexical borrowing – 1) need, referring to new communicative needs which may arise in a different sociocultural setting (a novel idea, concept or things from abroad) and 2) prestige, which refers to the

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process of borrowing a word from a dominant culture for one that already exists in the recipient language because they are considered highly prestigious. He also identifies a third rarer reason, i.e. for derogatory purposes. Generally, it is agreed that words are borrowed from the donor language to fill some semantic gap in the recipient language. Many sociolinguistic studies of loanwords have shown that active borrowing is typically, but not strictly, done by bilinguals who have access to the lexicon and grammar of both the donor language as well as the recipient language (Haugen, 1950; Paradis & LaCharité, 1997; Poplack et al., 1988). When loanwords enter the recipient language, they undergo some changes to conform to or suit the phonology of the recipient language. They may undergo substitution, deletion, or insertion of segments during borrowing. Most of these regular adaptation patterns are motivated by some linguistic or phonological constraints operating in the borrowing language, albeit a few non-phonological factors that can come into play during borrowing.

The present study focuses on the phonological adaptation of the consonantal segments in Arabic loanwords in Malayalam, especially in the Mappila dialect of Malayalam, spoken mainly by the Muslim community living in North Kerala (the districts of Kozhikode and Malappuram). This dialect shows a deep influence of the Arabic language, probably due to religious reasons since the Holy Quran and most Muslims' prayers are in Arabic, and certainly due to language contact situations for trade and commerce. Their continuous interaction with the Gulf region in the Middle East also contributes to the enrichment of the Mappila dialect.

Table 1 and Table 2 show the consonant inventory of Malayalam and Arabic, respectively.

	Bilabial	Labio-dental	Dental	Alveolar	Retroflex	Palatal	Velar	Glottal
Plosive Unaspirated	p b		t̪ d̪	T	t̠ d̠	c ɟ	k g	
Plosive Aspirated	p ^h b ^h		t̪ ^h d̪ ^h		t̠ ^h d̠ ^h	c ^h ɟ ^h	k ^h g ^h	
Nasal	m		n̪	n	ɳ	ɲ	ŋ	
Fricative		(f)		s	ʂ	ʃ		H
Trill/Tap				r/r̥	ɽ			
Lateral				l	ɭ			
Approximant		v			ɻ	j		

Table 1: Malayalam Consonants (Standard Malayalam)

	Bilabial	Labio-dental	Dental	Alveolar	Palato-alveolar	Palatal	Velar	Uvular	Pharyngeal	Glottal
Stops	B			t d t ^ʃ d ^ʃ			k	q		ʔ
Nasals	m			n						
Fricative		F	θ ð ð ^ʃ	s z s ^ʃ	ʃ		χ ^ʁ	ħ ʕ	H	
Affricate					dʒ					
Trill				r						
Approximant	w					j				
Lateral				l						

Table 2: Arabic Consonants (As Attested in Modern Standard Arabic or Classical Arabic)

Even though Table 1 shows a set of aspirated plosives in the Malayalam consonant inventory, not all speakers of Malayalam maintain this distinction when they speak the language. Aspiration in Malayalam is a result of the heavy influence of Sanskrit. There are no aspirated stops for speakers of the Mappila dialect. Also, the segment /f/ is exclusive to loanwords and some dialects of Malayalam and has the same orthographic representation as /p^h/. Some speakers, therefore, use both these sound segments interchangeably.

Malayalam and Arabic belong to the Dravidian and the Semitic language families, respectively. From Table 1 and Table 2, it is obvious that certain segments are not common to both languages. So, from the point of view of Malayalam, certain Arabic loanwords are not in tune with the phonological structure of Malayalam and need to undergo various changes to suit the phonology of Malayalam.

This paper, therefore, attempts to address the following question: How are the exotic consonantal phonemes in Arabic loanwords accommodated at the segmental level to fit the phonological structure of Malayalam? It also briefly looks at the strategies the dialect adopts in resolving the illegal consonant clusters.

2. Methodology

The data employed in this study are mainly taken from the daily speech of speakers in Kozhikode and Malappuram. The initial dataset of 166 loanwords are taken from Dr P. M. Joseph's Malayalathile Parakeeya Padangal. The words are elicited from five primary informants aged 25 to 40. Three of them are from Kozhikode district, and the other two are from Malappuram district. They have not travelled outside Kerala for the last 15 years. All the informants have the minimum qualification of degree graduation or equivalent. They all have learned basic Arabic in school and in 'Madrassa' education. However, they

cannot speak fluent Arabic. As for the transcription of Arabic source words, a native Arabic speaker was consulted. The transcription is based on the pronunciation attested in Modern Standard Arabic. Malayalam words are transcribed according to the most commonly used pronunciation within the community. IPA transcription is used for both the source and target languages.

The study has undertaken a descriptive analysis of the elicited Arabic loanwords in Malayalam within Danesi's Integrated Model of Loanword Nativization conceptual framework.

There are two types of loanwords - institutionalised words and ad-hoc creations. Institutionalised words have been around for a while. They are often not even considered loanwords by current speakers, or their origins are unknown to them. Many of these words exist in the recipient or borrowing language dictionaries. Ad-hoc creations maintain a certain degree of transparency, at least until they have become institutionalised. They are normally not incorporated in the borrowing language dictionaries. The data employed for this study consists of both types of loanwords.

The words are then categorised based on the Arabic sounds present in them. The adaptation pattern of each of these segments is then examined. The researchers have also sought the help of the data listed in other works in this area, such as Abdurehman (1978).

3. Danesi's Integrated Model of Loanword Nativization

Danesi's (1985) Integrated Model of Loanword Nativization is based on the principle that the common goal of discovering the nature of language can be made through the convergence of several techniques that progress in it. He proposes two principles within this model – 1) The Paradigmatic Principle, according to which loanwords are subject to reshaping according to their membership in a morphological class, and 2) The Phonological Synchronization Principle (PSP), according to which “the sounds of the item to be nativized are interpreted in terms of the syllabic, prosodic, phonemic and phonetic patterns” of the recipient language (1985: 29). The Paradigmatic Principle is beyond the scope of this paper. Hence, it is not discussed here.

The PSP involves two basic processes – phonetic substitution and phonological repatterning (phonemic approximation or restructuring). Phonetic substitution denotes substituting a foreign input with a nearly identical segment in the native inventory. If there is no corresponding phoneme, phonemic approximation occurs, resulting in phonological repatterning. Phonetic substitution looks for the closest segment with the same segmental category and occurs in terms of only one differential point of articulation feature (as in [t] > [t̪]). In the absence of one such segment within the same segmental class, phonemic approximation occurs, which may involve a change in the manner of articulation. Phonological repatterning can also take the form of syllabic or prosodic repatterning (Danesi, 1985).

4. Analysis

Based on the data used for the study, Arabic loanwords undergo three types of strategies during the process of loanword adaptation—segmental adaptation (or substitution), deletion/elision, and insertion/epenthesis. A detailed analysis of each of these processes is given in the following sub-sections.

4.1 Lenition of Emphatic Consonants

Arabic coronals can be divided into two groups – emphatic coronals and non-emphatic coronals. Emphatic coronals are those sound segments with primary articulation in the coronal region and secondary articulation in the pharynx. Non-emphatic coronals are produced in the coronal region and do not have any secondary articulation (/t/, /d/, /s/, /z/, /l/, /r/, /n/ etc). Arabic has four emphatic coronals – voiceless alveolar emphatic plosive /t^ʕ/, voiced alveolar emphatic plosive /d^ʕ/, voiceless alveolar emphatic fricative /s^ʕ/ and voiced dental emphatic fricative /ð^ʕ/. In many modern Arabic dialects, [ð^ʕ] has partially or fully merged with [d^ʕ] or [z^ʕ], and it rarely occurs in loanwords. Hence, voiced dental emphatic fricative /ð^ʕ/ will not be discussed here. ‘Pharyngealised’ or emphatic coronals are ruled out in Malayalam due to their prohibition against the combination of pharyngeal features and the [coronal] feature. Hence, emphatic coronals in Arabic loanwords, regardless of their position in the word, lose their pharyngeal features and get substituted by the closest sound present in the Malayalam inventory. In the data, Arabic /t^ʕ/, /d^ʕ/, and /s^ʕ/ lose their pharyngeal features and change to voiceless dental plosive /t̪/, voiced palatal stop /j/, and voiceless alveolar fricative /s/ respectively.

Arabic	Malayalam	Gloss	
/rat ^ʕ l/	/ra:ttal/	‘Pound’	(/t ^ʕ /t̪/)
/t ^ʕ ala:q/	/t̪ala:kkə/	‘Divorce’	(/t ^ʕ /t̪/)
/χat ^ʕ /	/katt̪ə/	‘Letter’	(/t ^ʕ /t̪/)
/s ^ʕ a:hib/	/sa:hibə/	‘Title of Respect’	(/s ^ʕ /s/)
/ʔiχla:s ^ʕ /	/ihla:sə/	‘Fidelity’	(/s ^ʕ ///)
/qas ^ʕ abah/	/kasaba/	‘Police Station’	(/s ^ʕ /s/)
/d ^ʕ ilʔ/	/jilla/	‘District’	(/d ^ʕ / > /j/)
/ha:d ^ʕ ir/	/ha:jar/	‘Present’	(/d ^ʕ /j/)

Here, in all instances, the Arabic voiceless alveolar emphatic plosive /t^ʕ/ is realised as voiceless dental plosive /t̪/ in Malayalam, a minimal repair involving a change in the point of articulation. The second instance of emphatic substitution in the loanwords is the substitution of the voiced alveolar emphatic plosive /d^ʕ/. This sound behaves quite differently from its voiceless counterpart. When the words with /d^ʕ/ enter the Malayalam lexicon, this segment is substituted by a voiced palatal stop /j/. Despite the existence of the voiced dental plosive /d̪/ in Malayalam, a segment closer to /d^ʕ/ than /j/ in terms of feature specification, /d^ʕ/ changes to become /j/ in most cases, if not always. In some cases, /d^ʕ/ adapts into the voiced dental lateral /ɺ/, which itself is a novel segment in Malayalam.

Arabic	Malayalam	Gloss	
/ramd ^s a:n/	/ramaḷ a:n/	‘Ramadan’	(/d ^s / > /ḷ /)
/wud ^s u:ʔ/	/oḷ u/	‘Ablution’	(/d ^s / > /ḷ /)

Thus, the Arabic segment /d^s/ exhibits a dual adaptation pattern. The change from /d^s/ could possibly be due to either indirect borrowing through other Indian languages such as Hindi, Urdu or Tamil wherein the segment /d^s/ or /z^s/ is realised as /z/ or /j/, or the variation in Arabic dialect from which the word is borrowed. Upon further investigation into the emphatics in Arabic, it is found that Classical Arabic and the modern dialects of Arabic have a special emphatic sound, i.e., the emphatic lateral [ḷ], which occurs in certain forms for words for Allah (ʔaḷḷa:h), or in the neighbourhood of other emphatic sounds, or in some unpredictable items such as loanwords and inherited Arabic vocabulary (Ferguson, 1956). According to many Arab grammarians, the Proto-Semitic emphatic lateral fricative [ḷ^s] is the ancestor of the Classical Arabic version “daad” phoneme. Daad phoneme continued to be articulated as an emphatic lateral fricative in the eighth century CE and is articulated laterally by some twentieth-century Quranic readers. This indicates that the source words of loanwords with /d^s/ > /ḷ/ must be either from the modern dialects of Arabic that produced the daad phoneme laterally or from the twentieth-century Quranic readers who articulated the daad phoneme as the emphatic lateral [ḷ]. This could be why Arabic loanwords with the segment dental lateral /ḷ/ are all associated with God and religion. It could essentially be the attempt of borrowers, who are also believers, to imitate the religious words to the best of their abilities, resulting in an imported segment /ḷ/. Ussishkin and Wedel (2003) suggest that a novel segment can be introduced into a language’s phonemic system if its production is a combination of already existing motor gestures in the language’s pre-existing inventory. The novel segment that can be produced without introducing some new features or the combination of borrowed features can achieve phonemic status more readily than those which require new articulatory gestures. The dental lateral is produced with the blade of the tongue touching the back of the upper teeth (articulatory gesture of Malayalam dentals) and leaving space on one side or both sides for the passage of the airstream (articulatory gesture of Malayalam lateral approximant). This segment is present only in Mappila Malayalam and has phonemic status (forms minimal pairs with voiced alveolar lateral /l/ and voiced retroflex lateral /ɭ/). So, this could be another possible explanation for its presence in some loanwords. It is, however, difficult to single out a factor with certainty unless you conduct a diachronic study of loanword adaptation, which is not within the scope of this paper.

The third instance of emphatic substitution in Arabic loanwords is /s^s/ > /s/. This involves only a minimal repair of loss of secondary articulation of the segment /s^s/, producing the voiceless alveolar fricative /s/, which is the closest segment in the Malayalam inventory.

The adaptation of all three Arabic emphatic sound segments in

Malayalam is lenition since it involves a decrease of articulatory effort in producing the sound.

4.2 Adaptation of Uvular Segments

The Modern Standard Arabic has three uvular sounds – the voiceless uvular plosive /q/, the voiceless uvular fricative /χ/, and the voiced uvular fricative /ʁ/. Malayalam does not have uvular segments. When they enter Malayalam, these segments get substituted by the phonologically closer velar consonants, which are the closest sound segments to the uvular consonants in the Malayalam inventory. Uvular and velar segments are distinguished from each other in terms of only one feature specification [+/- high]. The velar segments are [+high], and the uvular segments are [-high]. In the data, the Arabic /q/ and /χ/ change into voiceless velar plosive /k/, and /ʁ/ changes into voiced velar plosive /g/.

Arabic	Malayalam	Gloss	
/χali:fah/	/kali:fa/	‘Leader’	(/χ/k/)
/ʃajχ/	/ʃeikkə/	‘Sheikh’	(/χ/k/)
/ʁula:m/	/gula:m/	‘Slave’	(/ʁ/>)
/maʁib/	/magrib(ə)/	‘Sunset’	(/g/)
/qasʕabah/	/kasaba/	‘Police Station’ (of a major city)	(/q/k/)
/ba:qi/	/ba:kki/	‘Balance’	(/q/k/)
/ʔala:q/	/ʔala:kkə/	‘Divorce’	(/q/k/)

The adaptation /q/ >/k/ involves only a minimal repair of shifting its point of articulation. Since Malayalam doesn’t have velar fricatives in its native inventory, the Arabic uvular fricative gets substituted by the phonologically closest velar segments available, which are the Malayalam velar plosives. Thus, the Arabic /χ/ and /ʁ/ change into /k/ and /g/, respectively, during the loanword adaptation. It involves a shift in terms of the point of articulation (uvular to fricative) and the manner of articulation (fricative to plosive). Adaptation of uvular fricatives to velar stops is a widely attested occlusion process in loanword adaptation.

4.3 Deletion of Laryngeal Segments

Arabic has two laryngeal segments – the voiced glottal stop /ʔ/ and the voiceless glottal fricative /h/. Malayalam has only one laryngeal segment in its inventory – the voiceless glottal fricative /h/. In the data, all instances of non-final /h/ are non-adapted since Malayalam has /h/ in its inventory. However, the final /h/ of Arabic inputs is deleted during borrowing. This is because Malayalam prohibits word-final /h/. Adaptation of the final /h/ to any other segment would require too many steps as Malayalam has no other gutturals. Hence, /h/ is deleted in such words. In some cases, the word-final /h/ is realised as /ttə/. This variation can be attributed to the presence of a word-final letter ‘ه’ in the orthography of Arabic inputs, which is realised as /t/ or /h/ in Arabic. Also, Arabic speakers produce /t/ instead of the final /h/ in such words in connected speech. This variation in the realisation of orthographic ‘ه’

Arabic inputs is reflected in the loanword as well. All the instances of the other laryngeal segment /ʔ/ in Arabic inputs are deleted in Malayalam.

Arabic	Malayalm	Gloss	
/χali:fah/	/kali:fa/	‘Leader’	(/h/ > φ)
/qasʻabah/	/kasaba/	‘Police Station’	(/h/ > φ)
		(of a major city)	
/marmah/	/mara:mattə/	‘Public works’	(/h/ > ttə)
/ʕibadah/	/iba:d attə/	‘Worship’	(/h/ > ttə)
/ʔinʕa:m/	/ina:m/	‘Reward’	(/ʔ/ > φ)
/ʔami:r/	/ami:r/	‘Leader’	(/ʔ/ > φ)
/hajj/	/hajjə/	‘Hajj’	Non-adapted
/hadi:θ/	/hadi:s/	‘Sayings Prophet Muhammad’	of Non-adapted

4.4 Lenition of Pharyngeal Segments

Arabic has two pharyngeal sounds – the voiceless pharyngeal fricative [ħ] and the voiced pharyngeal fricative [ʕ]. Malayalam has no pharyngeal segments. So, these segments are either substituted or deleted.

The voiceless pharyngeal fricative /ħ/ is not present in Malayalam. Hence, /ħ/ in Arabic inputs is realised as the voiceless glottal fricative /h/, the phonologically closest segment available in Malayalam. Its voiced counterpart /ʕ/ gets deleted at all positions. In certain cases, /ʕ/ is realised as /h/ instead of getting deleted. However, the number of such occurrences is very low.

Arabic	Malayalam	Gloss	
/sʻa:ħib/	/sa:hibə/	‘Respected’	(/ħ/ > /h/)
/ħa:dʻir/	/ha:jər/	‘Present’	(/ħ/ > /h/)
/ħalwa/	/haluva/	‘Halwa’	(/ħ/ > /h/)
/nika:ħ/	/nikka:hə/	‘Marriage’	(/ħ/ > /h/)
/muharram/	/muharram/	‘Muharram (fast)’	(/ħ/ > /h/)
/ʕilm/	/ilmə/	‘Knowledge’	(/ʕ/ > /φ/)
/taʕallaq/	/tə:lukkə/	‘Taluk’	(/ʕ/ > /φ/)
/ʕasr/	/asar/	‘Evening’	(/ʕ/ > /φ/)

4.5 Adaptation of Labial Segments

As far as labial segments are concerned, three kinds of adaptation patterns are observed – the voiced labio-velar approximant /w/ to the voiced labio-dental approximant /v/, the voiced bilabial stop /b/ to the voiced labio-dental approximant /v/, and the voiceless labio-dental fricative /f/ to the voiceless bilabial stop /p/.

Arabic	Malayam	Gloss	
/waki:l/	/vak:i:l/	‘Lawyer’	(/w/ > /l/)
/wusʻu:l/	/vasu:l/	‘Receipt’	(/w/ > /l/)
/ħalwa/	/haluva/	‘Halwa’	/w/ > /v/
/ħulbah/	/uluva/	‘Fenugreek’	/b/ > /v/

/fat'i:r/	/pattiri/	'Pattiri (a type of bread)'	/f/>/p/
/jarbah/	/sarvattə/	'A type of drink'	(/b/>/v) Non-
	/sarbattə/	'Father'	adapted(/b/>/v)
/ba:ba:/	/va:ppa/		Non-adapted
	/ba:ppa/		
/fatwa/	/fattəva/	'Legal decision'	(/w/>/f) Non-
			adapted /f/
/bismi/	/bismi/	'In the name of Allah'	Non-adapted
/fa:tihah//	/fa:ttiha/	'The first verse of Quran'	Non-adapted

Both Malayalam and Arabic have a labial glide. However, they are phonologically slightly different. Malayalam has a voiced labio-dental approximant /v/, and Arabic has a voiced labio-velar approximant /w/. Hence, all instances of /w/ in Arabic loanwords are realised as /v/ in Malayalam. This adaptation is easily predictable. /w/ is distinguished from /v/ by the features [back, round]. /w/ is [+back,+round] and /v/ is [-back,-round].

Despite the existence of the voiced bilabial stop /b/ in Malayalam, the data shows that the Arabic /b/ in a few cases is adapted to the voiced labio-dental approximant /v/ in Malayalam. In majority of the cases, /b/ is unadapted. In some cases, /b/ and /v/ are used interchangeably in the borrowed words. Example, /ba:ppa/ ~ /va:ppa/ 'father'. However, this kind of adaptation pattern constitutes only a small part of the database. This behaviour could be due to some extra-phonological process. Moreover, the change from /b/ to /v/ is a natural phonological lenition process called approximantization. It eases the articulatory effort in producing the sound. In many instances, Malayalam /b/ ~ /v/ occurs in free variation, especially in the Mappila dialect.

The adaptation of /f/ into /p/ is a widely attested occlusivisation process. In the absence of a phonologically closer fricative segment in Malayalam native inventory, /f/ in Arabic inputs gets occlusivized to the phonologically closer voiceless bilabial stop /p/. However, in certain cases, we observe that the Arabic /f/ in loanwords are retained. This secondary adaptation pattern is a case of importation. According to Paradis and Lacharite (2005), the more bilinguals there are in a community, the more importations we find. /f/ is an importation in Malayalam. Then, the borrowed words with /f/ must have entered Malayalam at a later stage when a significant number of speakers are bilinguals and have access to sound structures of the language with the segment /f/, such as English and Arabic. Importations are a case of intentional phonetic approximations by bilinguals (Paradis & Lacharite, 2005). It also indicates that /f/ is becoming a part of the Malayalam inventory. It is, however, difficult to single out a factor with certainty unless a diachronic study of loanwords is conducted.

4.6 Adaptation of Coronal Segments

Arabic	Malayalam	Gloss	
/taʕallaq/	/t̪a:lu:kkə/	‘Taluk’	(/t/ > /t̪/)
/kita:b/	/kitt̪a:bə/	‘Book’	(/t/ > /t̪/)
/ʔada:lah/	/aɖ̪ a:latt̪ə/	‘Mediation’	(/d/ > /ɖ̪/)
/radd/	/raɖ̪ ɖ̪ ə/	‘Cancel’	(/ > /ɖ̪ /)
/usta:ð/	/ust̪a:ɖ̪ ə/	‘Madrasa Teacher’	(/t/ > /t̪, /ð/ > /ɖ̪ /)
/ðikr/	/ɖ̪ ikərə/	‘Prayer’	(/ð/ > /ɖ̪/)
/hadi:θ/	/haɖ̪ i:sə/	‘Saying of Prophet’	(/d/ > /ɖ̪/, /θ/ > /s/)
/zaka:h/	/sakka:t̪t̪ə/	‘Zakkah charity’	(/z/ > /s/)
/zajtu:n/	/sejt̪t̪ə/	‘Olive oil’	(/z/ > /s/, /t/ > /t̪/)

The Arabic coronal segments voiceless alveolar plosive /t/, voiced alveolar plosive /d/, voiceless interdental fricative /θ/, voiced interdental fricative /ð/, and voiced alveolar fricative /z/ are ill-formed segments in Malayalam. When Arabic words are borrowed into Malayalam, the Arabic segments /t/, /d/, /θ/, /ð/ and /z/ are realised as the voiceless dental plosive /t̪/, the voiced dental plosive /ɖ̪/, the voiceless alveolar fricative /s/, the voiced dental plosive /ɖ̪/ and the voiceless alveolar fricative /s/ respectively.

In Malayalam, /t̪/ is the phonologically closest segment to the Arabic /t/ as both differ in terms of only one point of articulation feature [+/- distributed]. Hence, the Arabic /t/ ([-distributed]) is realised as /t̪/ ([+distributed]) in borrowed words. Similarly, Malayalam /ɖ̪/ ([+distributed]) is the phonologically closest segment to the Arabic /d/ ([-distributed]). Therefore, /d/ changes into /ɖ̪/ during borrowing.

In the case of Arabic segment /θ/, the voiceless alveolar fricative /s/ is the phonologically closest Malayalam segment, as /s/ differs from /θ/ only by a point of articulation feature [-distributed]. Hence, /θ/ is adapted to /s/ during borrowing in Malayalam. As far as /ð/ is concerned, unlike the adaptation of its voiceless counterpart /θ/, due to the absence of a voiced alveolar fricative in the Malayalam inventory, the phonologically closest segment available is /ɖ̪/. The relevant adjustment involved is a change in the manner of articulation - /ð/ is occlusivized to /ɖ̪/.

Due to the absence of the voiced alveolar fricative in Malayalam native inventory, /z/ in Arabic loanwords gets devoiced, producing the native phoneme /s/. It is also observed that like the segment /f/, some Arabic loanwords have retained /z/ rather than being adapted or deleted. This is probably due to an increase in bilinguals among the speakers, who have access to the phonology of foreign languages with the segment /z/.

4.7 Vowel Epenthesis

Vowel insertion is another strategy adopted by Malayalam during loanword adaptation. Vowel insertion in Malayalam is normally triggered to rectify violations at the syllabic level.

4.7.1 Cluster Reduction

In cluster reduction, vowels are inserted to break the consonant clusters in loanwords that are not recognised in Malayalam. The following data shows the cluster reduction in Arabic loanwords:

Arabic	Malayalam	Gloss
/ʔixla:sʕ/	/ihəla:sə/	‘Fidelity’
/rahma:n/	/rehəma:ə/	‘Merciful’
/ibli:s/	/ibəli:sə/	‘Satan’
/maʕrib/	/maɟəribə/	‘Sunset’
/maðhab/	/maɟəhab/	‘School of religious thought’
/takbi:r/	/təkəbi:r/	‘Takbir’
/ðikr/	/ɟ ikərə/	‘Prayer’

Consonant clusters that do not undergo cluster reduction are given below:

Arabic	Malayalam	Gloss
/sultʕa:n/	/sulttə:n/	‘King’
/ʕilm/	/ilmə/	‘Knowledge’
/ʕarbah/	/sarvattə/	‘Drink’
/miski:n/	/miski:nə/	‘Needy’
/nasʕra:ni/	/n asra:ni/	‘Christian’
/tardʕam/	/tərdʕama/	‘Translation’
/madrasah/	/maɟ rasa/	‘Madrasa’
/barakah/	/barkattə/	‘Blessing’

From the data, it is observed that most of the consonant clusters that do not undergo vowel insertion or cluster reduction are those in which the first consonant is a sonorant or those clusters that can form licit onsets in Malayalam. In the former, the sonorant in the cluster goes to the preceding syllabus, and the second consonant goes to the following syllable. It does not violate the syllable structure of Malayalam as sonorants can occupy the coda or word-final position in Malayalam. No vowel insertion takes place here. The consonant clusters that can form legal onsets in Malayalam, such as [ɟ r], [sr], etc, also do not undergo vowel insertion.

Apart from the consonant cluster types that are mentioned in the last paragraph, all other clusters undergo vowel insertion. Vowel insertion in Mappila Malayalam involves only one step – Nucleus insertion. This empty nucleus position is then filled by the default or unmarked vowel in Malayalam, which is ‘schwa [ə]’.

4.7.2 ə-Epenthesis

In colloquial Malayalam, [ə] is inserted word finally when a morpheme ends in a consonant other than [m] and [n], and is not followed by a vowel-initial form (Mohanani, 1989). So Arabic loanwords in Mappila Malayalam that end in consonants undergo ə- Epenthesis to avoid the word-final consonant.

Arabic	Malayalam	Gloss
/rabb/	/rabbə/	Lord'
/χatʕ/	/kattə/	Letter'
/ðikr/	/d̪ ikərə/	Prayer'

Here, a nucleus is inserted, and this empty nucleus position is filled by the unmarked or default vowel [ə] in Malayalam.

4.8 Gemination

In Malayalam, single or non-geminate voiceless plosives do not occur intervocalically or word-medially; it get geminated (Asher & Kumari, 1997).

Arabic	Malayalm	Gloss
sultʕa:n/	/sultt̪a:n/	'MuslimKing'
fajtʕa:n/	/fejtt̪a:n/	'Satan'
χatʕam/	/katt̪am/	'Conclusion'

Gemination is also triggered when consonants other than /m/ and /n/ occur at the end of the Arabic loanword. Malayalam does not allow consonants word-finally other than /m/ and /n/. Example, /paŋam/ - 'Money', /ma:n/ - 'Deer'. Nevertheless, the occurrence of some final consonants in certain words is contingent upon the level of formality. Extremely formal speech allows sonorant consonants such as /m/, /n/, /l/, /l/, /r/ etc. word finally. Example, /pa:l/ - 'Milk', /kajar/ - 'Rope', /va:l/ - 'sword'. The colloquial Malayalam tends to disallow even these sonorant consonants as word-final consonants. In colloquial Malayalam, /ə/ is inserted word finally when a morpheme ends in a consonant other than /m/ and /n/, and is not followed by a vowel-initial form (Mohanam, 1989). In Colloquial Malayalam, we find /pa:lə/ - 'Milk', /kajarə/ - 'Rope' and /va:lə/ - 'Sword'. According to Asher and Kumari (1997), consonants /m/, /n/, occur word finally, and stops, fricatives, the nasals /ŋ/, /ɲ/ and the labio-dental velar approximant /v/ do not occur word finally. As far as the word-final /ŋ/, /l/, /l/, /r/, /r/ and /j/ are concerned, there is a degree of optionality. So when consonants other than the word-final consonants occur in Arabic loanwords, it attracts ə-epenthesis to avoid the illegal word-final consonant. Since single or non-geminate voiceless plosives do not occur intervocalically or word-medially, they then get geminated.

Additionally, Malayalam has a bimoraicity condition according to which all free-standing stems must minimally contain two moras (Mohanam, 1989). A mora is a short vowel or each half of a long vowel. So long vowels themselves are bimoraic. Post-vocalic consonants may or may not be moraic. According to Mohanam (1989), schwas are non-moraic. An intervocalic geminate must be moraic to express its duration. A word of CVC structure is monomoraic in Malayalam. /ə/ is added to this structure to avoid illicit codas. However, it doesn't contribute any moras to the word. In order to satisfy the bimoraicity condition in Malayalam, a monosyllabic word should have either a long vowel or a short vowel followed by a geminate consonant. Loanwords tend to accept either of these strategies during the adaptation process, i.e. either

lengthening its vowel or geminating the consonant after the short vowel. So Malayalam accepts CVC:ə structure but not *CVCə. Hence, a word of structure /kallə/ is acceptable in Malayalam, but not */kalə/. An example of gemination in a monosyllabic loanword is given below:

Arabic	Malayalam	Gloss
χatʰ	kattə	Letterʹ

5. Conclusion

The analysis has shown how foreign segments in Arabic loanwords are adapted and processed at the segmental level to suit the phonology of the borrowing language. There is a significant degree of regularity in the adaptations of these loanwords despite very few irregularities due to non-phonological factors. The study provides insights into the phonology of the borrowing language. Because of limitations in length, this article has not thoroughly explored the adaptation at the phonotactic level. However, we should keep in mind that phonotactics also play a big role in the loanword adaptation process. The analysis shows that the loanword adaptation is more phonological than phonetic. The borrowers correctly identify the foreign phonological segments in the loanwords and adapt them to suit their native phonology. The study also does not reject the idea that non-phonological factors can affect loanword adaptation. However, such cases are very rare in the database.

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