

# CORRELATION OF TONGUE PRINTS TO GENDER

**HARINI.G**

Graduate student

Saveetha Dental college

**Dr. Gheena S**

Reader

Department of Oral pathology

Saveetha Dental College, Saveetha University.

## ABSTRACT

**AIM:** To correlate the tongue prints and gender

**OBJECTIVE:**

- The impression of the tongue are taken in the random outpatient attending saveetha dental college, of which 15 were male and 15 were female.
- The alginate impression of the tongue is taken and the dental cast are poured
- This helps in capturing the features of and reproducing them in cast that can be used for forensic investigation

**BACKGROUND;**

Tongue has the specialised mucosa and hence it is considered as a sense organ. Like fingerprints every individuals has the unique pattern on tongue and hence its identification play an important role in forensics

**REASONS**

The use of tongue print as biometrics authentication has been under research and studies are found to be beneficial. Research on potential uses of tongue prints as a forensic tool is warranted

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## INTRODUCTION

Tongue is a vital organ present inside the oral cavity. Like fingerprint and lip prints each and every individual has a unique tongue pattern. Biometric scanning pave an important method in order to identify the individual . Recent advances like iris scanning, thumb print , lip prints, helps in identifying the person likewise the tongue print patterns creates a separate room in identification. Growing technologies in the modern world can easily duplicate the individual characteristics (eg. The signature can be easily forged by others) henceforth to minimise forgery and criminal activities newer methods are implemented. The growing interest towards recording the tongue prints create a new mode in the forensics. There is higher level of assurance in this type of identification process (1). The pattern of the tongue usually differs even for the identical twins. And it is difficult to forge unlike other systems

Tongue varies in its texture, colour, appearance, patterns .(3).Each part of the tongue possesses individual character. The anterior one third of the tongue is filled with the fungiform papilla. At the dorsum of the tongue the central fissures can be present. They provide both statistical and dynamic features for the identification. The tongue prints was evaluated only in 2D earlier but now there are more studies carried out in 3D also. The 2D imaging technique was first proposed by Bade et al (4) and the 3D imaging technique was done by Manoj et al (5). In India implementing these systems need a quantum amount of the research papers to be done in this direction. The tongue scanners are under research and are being tested(6).

There are no scanning devices created in India and henceforth the database are collected with the help of the alginate impression and class IV dental stone. The lingual impression is the impression that was taken along the lateral borders. This is very useful in determining the shape and the surface characteristics and serve as a permanent record through the cast (2)

### UNIQUENESS OF THE TONGUE

Tongue is a muscular organ that can perform without any support. It is termed as specialised mucosa because of the presence of papillae and taste buds. The taste buds are numerous and varies for each and every human individual. The prevalence of the prominent fungiform papilla is seen in Male especially in the smokers (7)

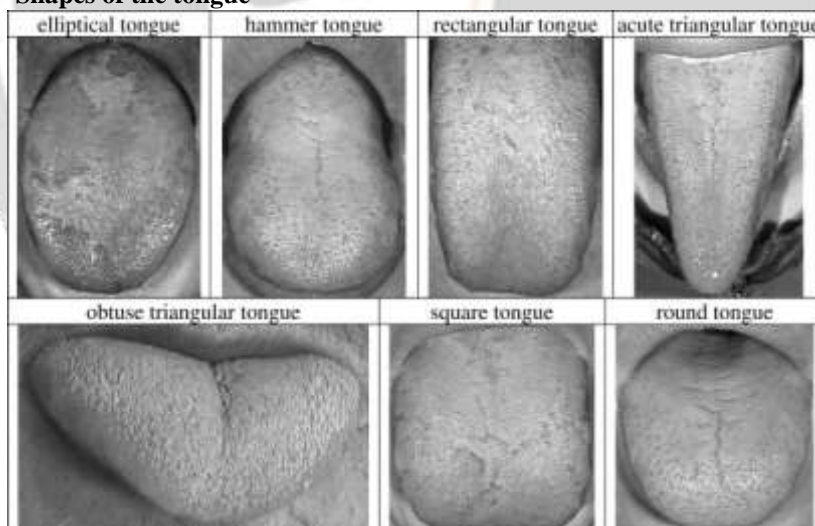
It acts as a natural cleanser and is capable of manipulating food. Because of its flexibility it can be easily recorded for the study. The colour of the tongue tells a lot about the personal health( pink tongue- good health, white tongue- fungal infection, yellow tongue- digestive problem) (8)

### CLASSIFICATION OF TONGUE

The classification of the tongue was usually based on its texture, shape, features. The classification based on texture (9), based on shape, based on tip (2) based on colour(10)

BASED ON TEXTURE	BASED ON SHAPE	BASED ON THE TIP	BASED ON COLOUR
Scrotal	Elliptical tongue	U-shaped Tongue	Pink coloured
Geographic tongue	Hammer tongue	V- shaped Tongue	Black film
Normal tongue	Rectangular tongue	Septated tongue	Yellow grid
	Acute rectangular tongue		Red spots
	Acute triangular tongue		Black coatings
	Obtuse triangular tongue		
	Square tongue		
	Round tongue		

Fig 1- Shapes of the tongue



### MATERIALS AND METHODS

This study includes 15 males and 15 females of random age group. The patient attending the out patient department of Saveetha Dental college was taken under the study. The subjects taken for the study was free from any tongue related pathology. Before taking the impression the patient were asked to rinse the mouth with Chlorhexidine Mouth wash. The patient was allowed to sit in the dental chair at the relaxed position

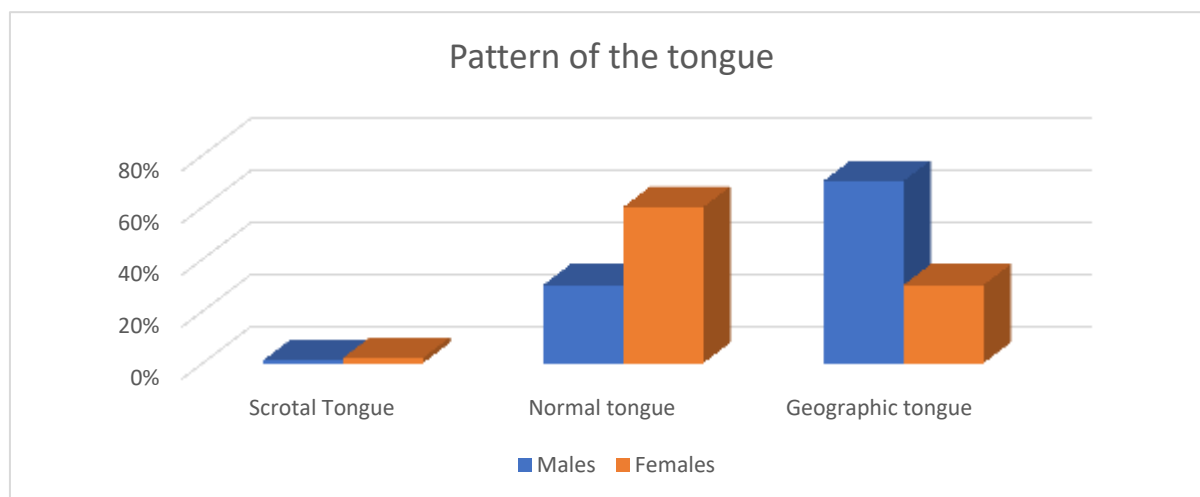
The impression of the tongue is taken in the relaxed position. This was done to relax the striated lingual muscle which might cause the change in the shape and the internal features of the tongue. The external features of the tongue was captured using digital photograph, In order to check for the lingual apex type, longitudinal grooves. Alginate is applied directly in the tongue of the individual. It is applied in the anterior one third on the tongue in order to avoid regurgitation reflexes. This covers the lateral border of the tongue, lingual border of the

tongue. It is reproduced with the help of the class 4 dental stone. The alginate impression has the advantages of duplicating images within minutes.

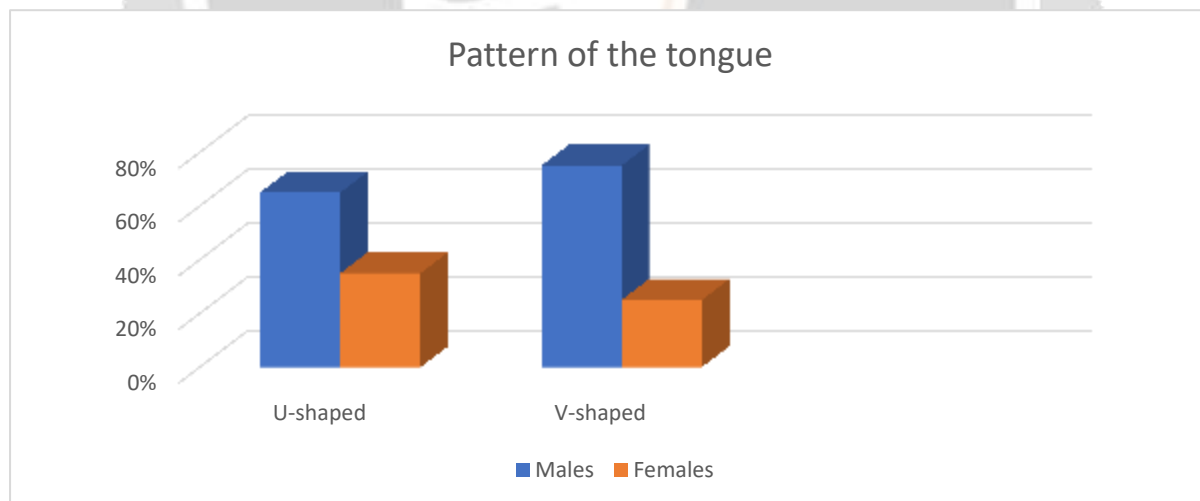
The correlation between the pattern and shape of the tongue was done using the Pearson Correlation Test

**RESULTS**

Pattern of the tongue	Males (n%)	Females(n%)	
Scrotal	1(6%)	0(0%)	
Geographic	4(12%)	5(14%)	
Normal	11(82%)	10(86%)	
<b>Pearson correlation</b>	<b>0.96</b>	<b>0.84</b>	



Shape of the tongue	Males	Females
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<b>U-shaped</b>	<b>11(65%)</b>	<b>4(35%)</b>
<b>V-shaped</b>	<b>12(75%)</b>	<b>3(25%)</b>
<b>Pearson correlation</b>	<b>0.87</b>	<b>0.93</b>

A total number of 30 participated in the study of which 15 were males and 15 were females. The first characteristic taken was the pattern of the tongue; scrotal tongue was observed in males(6%) when compared to female. Normal tongue pattern was observed in the females and the fissures associated with the geographical tongue was observed in males. And the correlation of the tongue pattern in found to be 0.96 in males and 0.84% was observed in the males for the pattern. The next was the shape of the tongue in which the u-shaped septated Tongue was observed in 75% of the Male and 25% in females and the correlation was found to be 0.87 in males for u-shaped tongue. V shaped tongue was found mostly in females with 75% in females and 25% in males. And the correlation value was found at the 0.93 .

## DISCUSSION:

As far the geometry of the tongue is concerned most of the normal tongue revealed longitudinal fissures in the middle of the tongue. These included individual characteristics. The types and the location of the fissures varies. Some of the people have the presence of single longitudinal fissure and few have branchings in the tongue. According to carina.et.al the study observed the presence of the longitudinal fissures at the 2/3<sup>rd</sup> of the tongue. . The related grooves are found to be straight,curved branched,narrow,multiple,jagged. (9). In our study the fissures revealed the maximum in the female population when compared to males. We can see the prevalence of foliate and the lingual papilla present in the anterior 1/3<sup>rd</sup> of the tongue. The prevalence of prominent taste buds is present in the male smokers. Females the papilla are seen as flat and tiny. According to Neta et al, 1987 the prevalence of the taste buds in male smokers was seen in concordance to our study and the fungi form papilla are seen in the lingual tip(10)

The u-shaped septated Tongue was seen in the most of the men and the v- shaped sharp Tongue in females was observed in our study. According to Radhika et al and Marius.et al, it reveals the same result as our study. The present study revealed no pathological aspect associated external features. Thus it was noticed that the longitudinal grooves may be perceptible / imperceptible, this can be extended over any segment of the dorsal surface, and over its entire length, displaying various shapes, a rectilinear/ twisty and a superficial/ deep profile.

Fig 1- v shaped tongue in 22 yrs old female. Fig 2- u-shaped septated tongue in 25yrs Male



## CONCLUSION

The dorsal surface is unique for every individual. The lingual impression with the photographic images can constitute more secure methods for forensic dentistry identification in addition to rugoscopy and chelioscopy ;this can be included in the biometrics.

For the sexual dimorphism standpoint, the following aspect may be specified. 1. The scrotal tongue and the geographic tongue is present in the males. 2. The predominant fissures are seen in female.

Thus making the classification and the anatomic aspect of the tongue, dorsal surface in addition to the analysis of the lingual surface can be used both for the educational as well as for the forensic purposes.

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