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## The Distribution of Tongue Rolling and Tongue Folding Traits among Niger Deltans

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### ABSTRACT

The purpose of this study was to determine the distribution of tongue rolling and tongue folding traits among Niger Deltans. The study adopted a cross sectional type of observational research design. Multistage sampling was employed in this study which involved two thousand three hundred and four subjects aged 18 to 65 years. Standard methods were applied in recording the ability for tongue folding and tongue rolling. Statistical analyses were performed using SPSS version 18. Results were arranged according to gender to ascertain the occurrence of sexual dimorphism. Chi-square test was useful in this regard. The tongue rolling and tongue folding traits were compared between the genders. Values at  $P < 0.05$  were considered significant. The frequency of rollers (1495) was more than non-rollers (809). There was a slightly higher proportion of tongue-rollers in females than in males ( $P > 0.05$ ). The result showed that the frequency of folders (1422) was more than non-folders (882). The incidence of tongue folding was more in the female gender ( $P > 0.05$ ). A reliable baseline data on the distribution of tongue rolling and tongue folding traits among Niger Deltans has been produced.

**Keywords:** Tongue rolling, Tongue folding, distribution, Niger Deltans

### INTRODUCTION

Alfred Sturtevant (one of the pioneers of *Drosophila* genetics) described tongue rolling as a simple two-allele character, with the allele for rolling (usually given the symbol T or R) being dominant over the allele for non-rolling (t or r)<sup>1</sup>. A researcher found that the proportion of tongue-rollers among Japanese schoolchildren increased from 54 percent at ages 6-7 to 76 percent at age 12, suggesting that over 20 percent of the population learn to tongue-roll during that age range<sup>2</sup>.

A study was done on tongue rolling and tongue folding in a sample of Chinese population and the ability to fold up the tip of the tongue was described as recessive. They demonstrated the independence of tongue rolling and tongue folding<sup>3</sup>. Odokuma *et al.* did a research on tongue rolling and tongue folding traits in an African population. They saw that the frequency of folders (120) and rollers (87) were more common than non-folders (23) and non-rollers (56). They also noted that the incidence of tongue rolling was higher in females than in their male counterparts.<sup>4</sup> The association between tongue rolling and tongue folding in Osogbo, Southwestern Nigeria was investigated. Of the 144 participants, the incidence of tongue rollers and tongue folders were 59.7% and 79.2% respectively<sup>5</sup>. A research was done on morphogenetic traits combination pattern amongst the population of Ekpoma, Nigeria with focus on tongue rolling, ear lobe attachment, blood

groups and genotypes. They observed that a higher percentage of the population (100; 51.81%) could roll their tongue while a lower percentage of the population (93; 48.19%) could not<sup>6</sup>. The occurrences and the frequency distribution of tongue rolling and folding in six populations of Manipur, India, have been compiled. They reported a non significant and higher frequency of tongue folding in females compared to males<sup>7</sup>.

Literature search reveals dearth of data on the distribution of tongue rolling and tongue folding traits among the Niger Deltans in Nigeria. This study provides a comprehensive data for use in anthropology and forensic medicine. The purpose of this study was to determine the distribution of tongue rolling and tongue folding traits among Niger Deltans. The Niger Delta consists of present-day Bayelsa, Delta, and Rivers States. Some 31 million people of more than 40 ethnic groups including the Bini, Efik, Esan, Ibibio, Igbo, Annang, Oron, Ijaw, Itsekiri, Yoruba, Isoko, Urhobo, Ukwuani, and Kalabari, are among the inhabitants in the Niger Delta, speaking about 250 different dialects.<sup>8</sup>

### MATERIALS AND METHODS

Approval for this study was obtained from the Anatomy Department Research and Ethics Committee in the Delta State University, Abraka. Consent was obtained from each participant as only voluntary subjects were allowed to participate in the exercise.

The study area is the Niger Delta region in Nigeria. There were 6 ethnic groups randomly selected namely: Igarra, Etsako, Urhobo, Isoko, Ika and Efik. The specific locations where this study was carried out are Abraka, Calabar, Igarra, Agenebode, Agbor and Ozoro. The study adopted an observational research design. The multi-stage sampling technique was employed in the study that involved 2304 subjects aged 18 to 65 years. The formula for sample size determination is:

$$n = \frac{z^2 \times p(1-p)}{e^2}$$

n = required sample size, z = confidence level at 95% (standard value of 1.96), p = estimated prevalence in the project area (assumed to be 0.30), q = 1-p, e = margin of error at 1.9% (0.019).

$$n = \frac{1.96^2 \times 0.30(1-0.30)}{0.00035}$$

$$n = 2304.96.$$

Standard methods were applied in recording the ability for tongue folding and tongue rolling in this cross sectional study. This was made possible by intra – oral examination done by one examiner. Those with tongue-rolling ability were regarded as those with the ability to roll the lateral edges of the tongue upwards into a tube. Subjects with the ability for tongue folding are those that can have the distal part of their tongue fold back upon the base of the tongue. The details of each subject such as ethnicity, age and gender were collected using a brief questionnaire. The subjects with history or clinical presentation of pathological conditions or trauma of the tongue were excluded from the study.

The data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS 18). The differences in the distribution of tongue rolling and tongue folding traits between the two genders were appreciated using the chi-square test as a  $P < 0.05$  was considered significant.

## RESULTS

**Table 1:** Socio-demographic characteristics of the Niger Deltans.

ETHNICITY	GENDER	NUMBER	TOTAL	PERCENTAGE
Igarra	Male	200	384	52.1
	Female	184		47.9
Etsako	Male	194	384	50.5
	Female	190		49.5
Urhobo	Male	198	384	51.6
	Female	186		48.5
Isoko	Male	184	384	47.9
	Female	200		52.1
Ika	Male	187	384	48.6
	Female	197		51.4
Efik	Male	184	384	47.9
	Female	200		52.1

Table 1 shows the bio-cultural backgrounds represented in the sample of Niger Deltans.

**Table 2:** The distribution of tongue rolling trait among Niger Deltans.

GENDER	FREQUENCY	ROLLERS	NON ROLLERS	TOTAL
MALE	Count	751	396	1147
	Percentage (%)	32.60	17.19	49.78
FEMALE	Count	744	413	1157
	%	32.29	17.93	50.22

Table 2 shows that the frequency of rollers (1495) was more than non-rollers (809). There was a slightly higher proportion of tongue-rollers in females than in males ( $P > 0.05$ ).

**Table 3:** The distribution of tongue folding trait among Niger Deltans.

GENDER	FREQUENCY	FOLDERS	NON FOLDERS	TOTAL
MALE	Count	679	468	1147
	%	29.47	20.31	49.78
FEMALE	Count	743	414	1157
	%	32.21	17.97	50.22

Table 3 shows that the frequency of folders (1422) was more than non-folders (882). The incidence of tongue folding was more in the female gender ( $P > 0.05$ ).

## DISCUSSION

There was a slightly higher proportion of tongue-rollers in females than in males ( $P > 0.05$ ). This implied that the gender difference in the incidence of tongue rolling was not significant. The present study is in line with the findings of Bulliyya who observed no significant gender difference in tongue rolling<sup>9</sup>.

This study revealed that the incidence of tongue folding was more in the female gender. This study concurred with that of researchers who observed that the incidence of tongue rollers and tongue folders was higher in females when compared with their male counterparts<sup>4</sup>. The gender difference in the incidence of tongue folding was not significant ( $P > 0.05$ ). This concurred with the findings of the Indians seen from two different investigations<sup>7, 9</sup>. Some other studies reported significantly higher frequency of tongue folding in females compared to males<sup>5, 10</sup>.

The present study revealed that the proportion of people who can roll their tongue (65%) was higher than the proportion of people who cannot roll their tongue (35%). This concurred with researchers who stated that the proportion of people who can roll their tongue ranges from 65 to 81 percent, with a slightly higher proportion of tongue-rollers in females than in males<sup>1, 2, 3, 5, 11</sup>.

A Southwestern Nigerian study reported a higher incidence of tongue rollers (59.7%) than non-rollers<sup>5</sup>. The frequency of rollers was 60.8% in an African population<sup>4</sup> and this is similar to the finding in this study. The different studies discussed above portrayed differences in the morpho-genetic traits considered. There may be many reasons for this such as methodology and age.

## CONCLUSION

A reliable baseline data on the distribution of tongue rolling and tongue folding traits among Niger Deltans has been produced.

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