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# Anthropometrical study of the second and fourth digit ratio of Andoni (Obolo) groups of Ijaw ethnic nationality in Nigeria

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## ABSTRACT
This study was carried out to document values of the 2nd to 4th digit ratio of Andoni (Obolo) group of Ijaw ethnic nationality. Seven hundred and two subjects between ages of 15 and 60 years were recruited randomly excluding those with hand deformities. Three hundred and fifty (49.9%) were males and three hundred and fifty two (50.1%) were females. Their 2nd (2D) and 4th(4D) digit lengths were measured from the basal crease to the tips using a venier caliper measuring to 0.01cm minor reading. The 2D:4D were then calculated for each subject on both hands. Descriptive statistics and ANOVA were used to analyze the data. Results obtained showed significant differences ($p<0.001$) in 2D:4D between males (0.95±0.03) and females (0.96±0.05). .Males had longer digits with lower digit ratio while females had shorter digits with higher digit ratio. This result confirms that digit ratio is sexually dimorphic and represents the original data for the people of the Niger Delta.
**Key words:** 2D:4D, Andoni, Niger delta and Nigeria

## INTRODUCTION
Digit ratio commonly known as 2D:4D is the ratio of the index finger (2D) to ring finger (4D) (Manning et al, 2000). Digit ratio has been reported by many workers to show sexual dimorphism with women having higher ratio than men (Phelps 1952, Manning et al, 1998, Manning et al, 2002. Manning et al, 2002 reported that, for males, the index finger is generally about 96 percent of the length of the ring finger, which gives an average digit ratio for male of 0.96. Females have a digit ratio of about 1.0. The sexual dimorphism in 2D:4D is influenced by prenatal secretion of testosterone and estrogen. Testosterone negatively correlates with 2D:4D while estrogen correlates positively with 2D:4D (Manning et al, 2002). Fertility and human behavior (Manning et al,2002), aggression and assertiveness ( Wilson G. D; 1983 and Allison et al, 2004), personality factor and hand skill and medical conditions such as breast cancer, autism and Congenital Adrenal Hyperplasia (Windy M. Brown 2002) has also been explained with digit ratio study. Manning, 2002, reported significant racial and ethnic variations among Caribbean Jamaicans and white Caucasians. However Oladipo et al, 2006 reported ethnic variation between Igbo and Urhobo ethnic groups of Nigeria. The racial and ethnic variations reported earlier underscores the need to document values for Andoni (Obolo) group of Ijaw ethnic Nationality in located sin the Niger Delta on longitude 3° -8.20°E and latitude 4°-6°N inhabiting the extreme eastern corner of it from Bonny River to the Cross River

estuaries (Enemugwem, 2006). The Andonis were the pioneer settlers in the Niger Delta (Anene, 1966). Hence, this data will represent the original values for the Niger Delta people.

## MATERIALS AND METHODS

Seven hundred (702) human subjects between ages of 15 and 60 were selected at random for this study. Three hundred and fifty (49.9%) were males while 352(50.1%) were females. The subjects were drawn from nearly all communities in Andoni all in Niger Delta. The length of the 2nd, 4th digits of right and left hands were measured on the ventral surface from the basal crease to the tips, using a venier caliper measuring to 0.01cm minor reading (Manning, 1995, Scutt and Manning, 1996. 2D:4D for both hands were then calculated. Subjects with injuries to these digits were excluded from the study. Descriptive statistics and ANOVA were used to analyze the data collected .

## RESULTS

The results of this study are shown on the table 1 below:

**Table 1:** Shows the mean and SEM and statistical significant levels between males and females of Andoni

| PARAMETERS | MALES | FEMALES | F-RATIO | SIG. LEVEL |
|---|---|---|---|---|
| R2D±SEM/CM | 7.20±0.03 | 6.987±0.06 | 8.130 | P<0.001 |
| L2D±SEM/CM | 7.46±0.20 | 7.205±0.05 | 11.772 | P<0.001 |
| R4D±SEM/CM | 7.58±0.03 | 7.268±0.03 | 40.62 | P<0.001 |
| L4D±SEM/CM | 7.79±0.03 | 7.475±0.03 | 98.533 | P<0.001 |
| R2D:4D±SEM | 0.95±0.03 | 0.96±0.05 | 4.96 | P<0.001 |
| L2D:4D±SEM | 0.95±0.03 | 0.96±0.03 | 2.21 | P<0.001 |

The results showed a statistical difference in the right 2D (F=8.130, P=0.001), left 2D (F=11.772, P=0.001), right 4D (F=40.62, P=0.001), left 4D (F=98.533, P=0.001) right 2D:4D (F=4.96, P=0.001) and left 2D:4D (F=2.21, P=0.001) between males and females. Andoni (Obolo) males therefore had a digit ratio of 0.95 while females have a digit ratio of 0.96. Females had longer second digits than fourth digits. Males had longer fourth digits than second digits. This accounts for the higher digit ratio in females than in males. These results however confirms that digit ratio (2D:4D) is sexually dimorphic. It was observed in this study that males had longer digits compared to females. This is however not common.

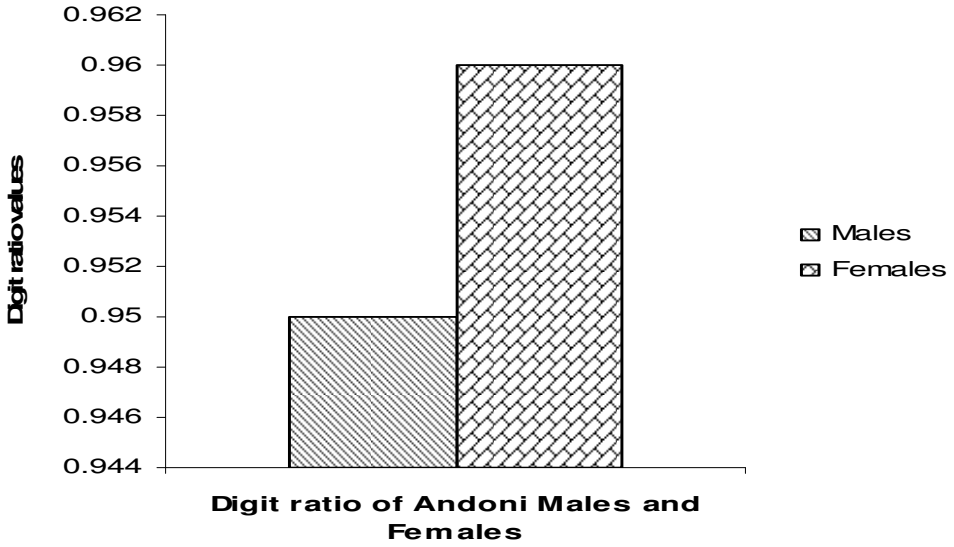
## DISCUSSION

It was observed from this study that second digit length in males was shorter than fourth digit length and significantly different as compared with the females. This agrees with the reports of George (1930), Phelps (1952) Manning et al (1998), Manning et al, (2000), who reported that second digits in males tend to be shorter than fourth digits. These digits lengths are influenced by testosterone and estrogen in utero (Manning et al 2000).

The observed second digit lengths for Ikwerre females was similar to observations of Manning et al (1998), Manning et al (2002), that second and fourth digit lengths in females are approximately the same.

In this study 2D:4D has been found to be sexually dimorphic with females having higher digit ratio compared to males. This observation agrees with earlier reports by Phelps, 1952, George 1930, Manning et al 1998, Manning, et al 2000, Manning,

et al 2002, Manning, et al 2003, Oladipo et al 2006. This sexual dimorphism in 2D:4D is influenced by prenatal testosterone concentrations. This hormone is thought to modify developmental rate such as epidermal ridges of the digits (McEwen, 1981; MacLusky and Naftolin, 1981; Bardin and Caterall, 1981; Geschwind and Galaburda, 1985). High concentrations of fetal testosterone indicate a low 2D:4D ratio, which therefore indicates high prenatal testicular activity. On the other hand 2D:4D is positively correlated with oestrogen in men and women.




## CONCLUSION

The result of this study has shown that 2D:4D is sexually dimorphic. This information is useful in forensic science and anthropology. Therefore, other ethnic groups in the Niger Delta should be studied.

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