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Comparative Morphometry of the Genus Thais from Nembe, Bakana and Calabar

Precious Itolima[1*], A. P. Ugbomeh[1] and J. N. Onwuteaka[1]

[1]*Department of Applied and Environmental Biology, Rivers State, Nigeria.*

Authors' contributions

This work was carried out in collaboration among all the authors. Author PI designed the study, performed the statistical analysis, with the guidance of authors APU and JNO; Authors APU and JNO supervise the study; All authors read and approved the final manuscript.

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ABSTRACT

Aim: Morphometry of *Thais* spp found in the Niger Delta Mangrove vegetation of Bakana, Calabar and Nembe were examined and compared.
Study Design: The study is a cross-sectional observational study
Place and Duration of Study: The study ws carried out in Bakana, Calabar and Nembe during a period of six months(January to June, 2018).
Methodology: A total of 600 specimens (100 specimens per month) were collected during a period of six months (January to June 2018) from the three sampling communities. Three different species were identified namely: *Thais coronata, Thais haemastoma* and *Thais lacera.* Shell dimensions were measured to the nearest millimeter using Vernier calipers and weighed, to get the morphometric Characteristics: Whorl Diameter (WD), Shell length (SL), Shell width (SW), Body whorl length (BWL), Aperture length (AL), Aperture Width (AW) Shell Breadth (SB), and Animal Weight (AW). Number of whorls, number of primary spiral cord on the body and number of ridges or teeth inside of outer tip of the aperture were counted.
Results: The disparity between the morphometric traits across the different species identified were minimal as most of the species had similar values of morphometric traits. However, differences can be identified using their colour; *thais coronata* (dirty light grey), *T haemastoma* (light grey), and *T*

**Corresponding author: Email: itolimaprecious@gmail.com;*

lacera (plane grey). The Three (3) species had a modal length class of 3.5cm to 4.5cm. *Thais coronata* and *Thais lacer*a had a modal weight class of 9-11grams while *Thais haemastoma* had a modal weight class of 6-7grams. It was observed with the aid of length/weight relationship that the found in all study.

Conclusion: It was observed with the aid of length/weight relationship that the *Thais* specimen found in all study locations exhibited a very weak linear relationship with very low R^2 values across locations. The exponent b of *Thais coronata* and *Thais haemastoma* and *T. lacera* across the three study locations indicate a negative allometric growth pattern. The Month of April for samples collected from Nembe had the highest condition factor for the three (3) species. T. coronata (4.4), T. lacera (6.38) and T haemastoma (5.5).

Keywords: Comparative; morphometry; genus thais; Nembe; bakana; Calabar.

1. INTRODUCTION

The genus Thais belong to the family *Muricidae*, and are gastropods that are found in the phylum Mollusca. They are one of the largest group of marine organisms and have been known for many years as a major source of protein consumed by human and other macro organisms. This class gastropods have been known to consist of snails that possess outer shells into which the animal can generally always withdraw. Gastropods were found and were also to known to successfully thrive and live in different habitants such as ocean, fresh water and land. They perform specific roles in keeping ecological balance intact and they, being a highly diversified group compared to the other group in the phylum Mollusca are commercially beneficially to humans. They are also used as ornaments and perform various ecological functions, especially maintaining the balance in the environment as well as to provide food and livelihood for humans This family contains a highly diverse group of species that are distributed in tropical, subtropical regions [1]. In Nigeria, *thais* is found in Mangrove forests located in the Niger delta region. The Niger Delta mangrove forests forms a clear vegetation zone along the entire coastline and plays the traditional role of breeding and nursery ground of important fish and shell fish. The gastropod mollusks (thais, bivalves) are the permanent inhabitants of the mangrove community [2]. The Muricidae are the third largest group in the class gastropoda and are a taxonomically complex family consisting of around 1,502 species that are found worldwide [3]. For classification and Nomenclatures of gastropod family, the family is separated into 13 sub- families that are further subdivided into more than 90 genera. This classification is based largely on superficial shell and radular character due to poor phylogenetic knowledge associated with this family [4].

Muricidae are members of the order neogastropod which contains more than 10,775 estimated species and represent the largest order in the class Gastropoda and comprises close to 30,239 species [3,5]. Members of the Muricidae are distinguished from other neogastropods families by the presence of rows of protrusions or spines on their shells [6]. The shell sculpture is elongated possessing a long siphon canal, their operculum has either a marginal or lateral nucleus and their eggs are usually laid in protective corneous capsule that usually form when crawling juveniles hatch. Planktonic larva are carnivores that generally feeds on economically important mollusks as well as *barnacles* [7]. The soft body of their prey is reached by drilling hole with the aid of a softening secretion and scraping of a toothed structure known as radula. Their carnivorous tendencies make them to be considered as pests, as they may cause substantial destruction in exploited natural beds and areas of cultured commercial bivalves.

Thais, rock shell, dog whelk, dog winkles, Ngolo are present on mangrove tree trunks, breathing roots, oyster beds, granite bunds, walls of intertidal monsoon drains, as well as on rocks and boulders on the shore and exhibit both restricted geographical and local distribution [8]. They generally prey on barnacles, polychaetes, bivalves and other gastropods (e.g., Taylor, 1976, 1980). Some feed on the sap of a dead mangrove tree. Therefore, the aim of this study was to assess and compare the mophometry of the Thais species from Nembe, Bakana and Calabar.

2. MATERIALS AND METHODS

2.1 Study Area

The study areas were in Bayelsa in Nembe, Rivers in Bakana, and cross river in their different fishing pond settlement namely mobogiri, golibogiri, and fisherman village in Nembe, Owuogono, ebekemoko in bakana. The vegetation's of the area is predominantly mangrove and swamps with no occurrence of Nypa palm and other coastal vegetation. The tidal amplitude is between 1.5 to 2 m in normal tide and water level increases and decreases depending on the lunar cycle [9].

2.2 Collection of Sample (Thais Sampling)

The samples were collected by hand picking on the mangrove mud during low tide at the locations by the local fishermen and carried in sack bag until large enough before bringing it to the community where it's been brought by the traders and taken to the market for sales to the mzlarket women, in which the sample is brought and different species that are labeled separately differentiating the different species and taken to the laboratory where it is stored for analysis.

2.3 Morphometric Measurements

Shell dimensions will be measured to the nearest millimeter using Vernier calipers and weighed, to get the morphometric Characteristics: Whorl Diameter (WD), Shell length (SL), Shell width (SW), Body whorl length (BWL), Aperture length (AL), Aperture Width (AW) Shell Breadth (SB), and Animal Weight (AW).

Number of whorls, number of primary spiral cord in the body, number of ridges or teeth inside of outer tip of the aperture will be counted.

2.4 Laboratory Analysis

Samples collected were washed properly to remove dirt, and were put in a sieve to drain and then stored in a polyethylene bag in the refrigerator for preservation.

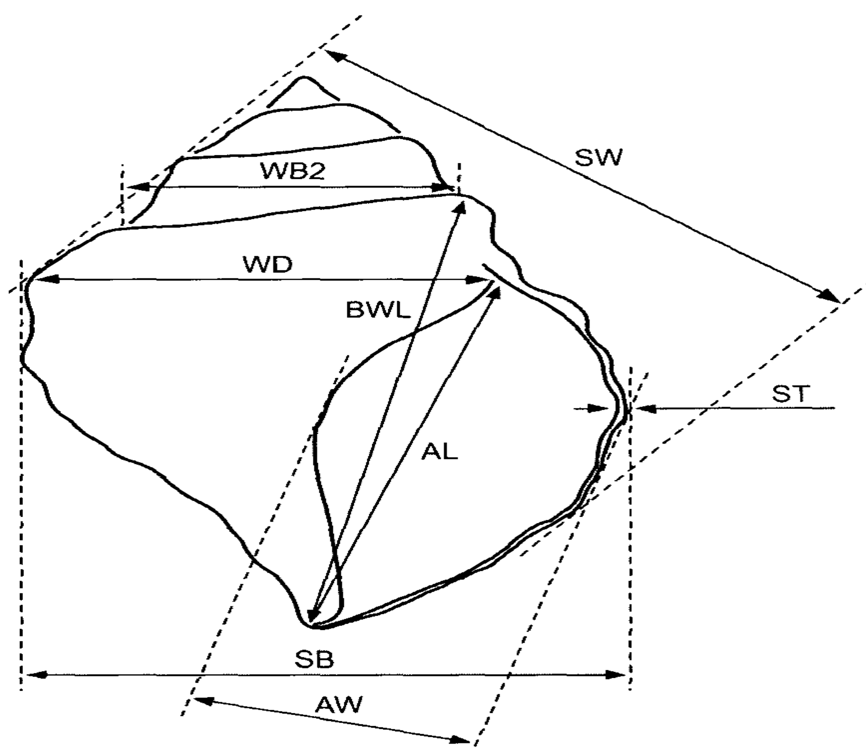

Fig. 1. Morphometric parameters

(a) The number of whorls (NW) on each shell was counted and recorded.
(b) The shell length (SL) of each shell was measured with a Vernier caliper and recorded in Centimeter (cm) to two places of decimal.
(c) The shell width (SW) of each shell was measured in centimeter (cm) in vernier caliper and recorded.
(d) The aperture width (AW) also of all the specimen were measured and recorded in cm nearest to two decimal places.
(e) The body whorl length (BWL) of each shell was measured in centimeter (cm) in Vernier caliper and recorded.
(f) The shell thickness is measured of each shell is measured in centimeter to two decimal places
(g) Number of whorl of each shell is counted and recorded (No of Whorl).
(h) Number of tubercles in the body whorl of each shell is counted.
(i) Number of ridges inside the upper lips is counted and recorded.
(j) The number of primary spiral cord of each shell is counted and recorded.
(k) Each shell with the contents (ws/m) was weighed in a Mettler Ae 163 balance and recorded in grams nearest to two decimal places.
(l) Each shell was cracked to remove the fleshy body. The flesh was then put in a pre-weighed watch glass and weighed. The weight of the flesh (weight of body mass – wm) was obtained from weight of flesh + watch glass minus weight of watch glass.

The weights were recorded in grams to two places of decimals.

2.5 Analysis of Data

Shell dimensions will be measured to the nearest cm using vernier calipers and weighed, to get the morphometric Characteristics shell length (SL), Shell width (SW), Body whorl length(BWL), aperture length(AL), Aperture width(AW) shell weight(SW), and animal weight(AW).

Number of whorls, number of primary spiral cord in the body, number of ridges or teeth inside of outer tip of the aperture will be counted The animals would be relaxed in 7.5% magnesium chloride solution mixed with an equal volume of seawater to examine soft body morphologies. Juveniles and adults will be both examined, noting their colour (when dry or wet) and surface morphology. The animals would be relaxed in 7.5% magnesium chloride solution mixed with an equal volume of seawater to examine soft body morphologies.

2.6 Length and Weight Relationship

The length weight relationship was determined using cube law given by Lecren (1951).

$$W = a1^{b}$$

Where

W= Weight in grams (g)
L = Total Length in Centimeter (cm)
a = proportional constant or intercept
b = an Exponent

The equation was log transformed and were determined by linear regression analysis and scatter diagrams of length and weight were plotted

The logarithmic transformation of the formula is

$$\text{Log } W = \text{Log } a + b \log L$$

Where,

W = weight of Thais in gram
L = observed total length in cm
a = regression intercept
b = the regression slope

The equation was log transformed to estimate the parameters "a" and "b". If b is equal to 3, it is an isometric growth pattern, but if b is not equal to 3 (that is, b is > or < 3), it is an allometric growth pattern, which may be positive if b > 1 or negative if b < 1.

2.7 Statistical Analysis

With the aid of JMP, SPSS and Microsoft Excel, statistical analysis was done on the data obtained from the study. Two sample student *t* test shall be used to compare the differences of the length and width of radula teeth, soft body shell ratios and other measured parameters. Chi-square tests shall be used to assess prevalence and intensity. L-W relationship shall be determined. Ratios of morph metric measurements against total Length were estimated.

3. RESULTS AND DISCUSSION

3.1 Descriptive Analysis of Morphometric Traits

During the sampling period there were different species of Thais found in the study locations of Nembe, Bakana and calabar. The species were picked randomly at the study sites. There was a combination of different species of thais namely *thais coronate;* which was the dominant species of at least five out of ten, followed by *thais Heamastoma* and then *thais lacera.*

3.2 Thais Lacera

Their shells have 2-5 body whorl with largest secondary spiral cord of (8-12) that are present between first two cells. its aperture is ovate and the inside of the outer lips is smooth while their siphonal canal is short and two groved sulcus present instead of outer lip colon. The shell surface colour is plane grayish or yellow tan.

Plate 1: Thais lacera

Plate 2. *Thais coronata*

Plate 3. Thais heamostoma

Table 1. Comparative statement of meristic traits in three species of thais

Morphology	*T. Coronata*	*T. haemastoma*	*T. lacera*
No of Whorl (Range)	2-6	3-6	2-5
Colour	Dirty grey	Light grey	Plane grey
No of Ridges (Range)	5-27	8-25	0
No of Spiral cord (Range)	7-51	17-43	22-51
No of Nodes on body wall (Range)	3-33	10-21	9-21
Shell Thickness	0.1	0.1	0.1
APL/AW (Ratio)	2.06	2.36	2.41
APL/BWL (Ratio)	0.79	0.41	0.83
BWL/WD (Ratio)	0.87	0.92	0.87
SL/BWL (Ratio)	1.16	1.16	1.13
SL/APL (Ratio)	1.45	2.87	1.32

Table 2. Descriptive statistics of morphometric traits

Statistics	Variable	T. coronate	T. haemastoma	T. lacera
Mean±SD	SL	4.03±0.77	4.28±0.87	3.95±0.6
	SW	3.28±0.5	3.31±0.43	3.38±0.46
	BWL	3.45±0.53	3.68±0.47	3.48±0.62
	APL	2.77±0.41	2.98±0.44	2.89±0.45
	APW	1.34±0.34	1.39±0.26	1.33±0.25
	SWT	10.56±3.67	10.02±3.47	10.67±3.32
	AW	1.34±0.76	1.26±0.89	1.21±0.67
Minimum`	SL	2.3	3	2.4
	SW	2.1	2.3	2.4
	BWL	0.1	2.5	2
	APL	1.6	2	1.6
	APW	0.1	1	1
	SWT	3.85	5.39	5.45
	AW	0.2	0.4	0.4
Maximum	SL	9.3	9.3	4.8
	SW	4.5	4.3	4.5
	BWL	4.7	4.5	4.7
	APL	4.1	4.4	3.8
	APW	3	2.2	2
	SWT	25.88	23.34	20.79
	AW	6.5	6.5	4.5

Where SL (Shell Length); SW (Shell width); BWL (Body whorl length); APL (Aperture length); APW (Aperture width); SWT (Shell weight) and AW (Animal weight); Descriptive analysis of Shell Morphometric traits

3.3 *Thais coronata*

Commonly known as the rock shell has spinned thick walled shell and mostly noticed to have short wall with the shell closed by a long operculum, they are up to 5cm in length and are it colour is dirty grey to brown grey .

3.4 Thais Heamostoma

This conch shell is red mouthed up to 80cm long, is robust, oval has series of nodes that run along the spiral shell and very short and the operculum is cod.

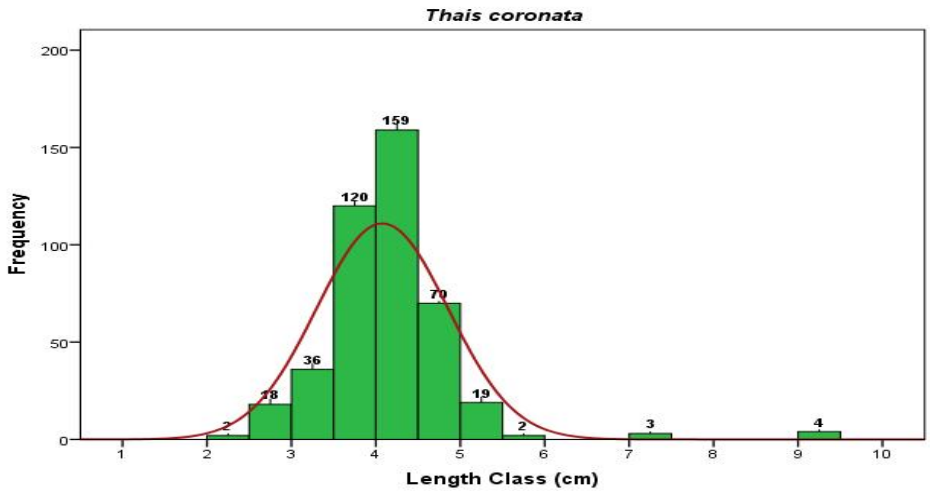

Fig. 2. Length size class of *Thais Coronata* found in all the study stations

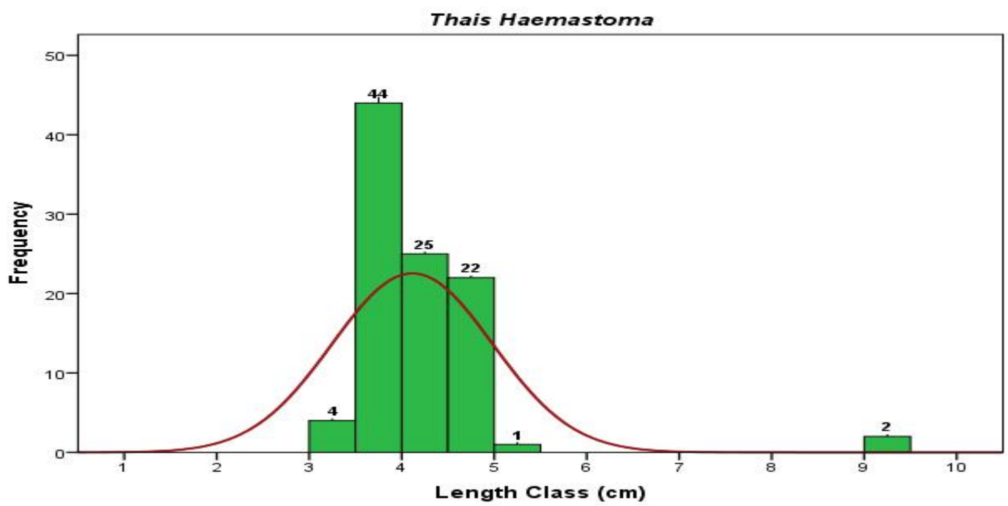

Fig. 3. Length size class of *Thais haemastoma* found in all the study stations

Table 1 shows the Comparative statement of Meristic Traits in three Species of Thais identified during the study.

3.5 Comparative Meristics Trait

Table 1 shows the result of the body ratio of the Aperture length to animal weight, Aperture length to the body whorl length, body whorl length to the whorl diameter, shell length to the body whorl length and shell length to the aperture length.

Table 2 Shows the mean standard deviation of the shell length, shell width, Body whorl length, Aperture length, Aperture width, shell weight and animal weight of *T coronata*, *T. haemastoma* and *T. lacera* .

3.6 Length Size Class Frequency

Thais coronata found in all the study locations where measured to get Length size class (Fig. 2). Results show the most dominant size class or modal class to be 3.5 cm-4 cm (178) and 4cm-4.5 cm (123). Very few had size classes of 2cm-2.5 cm (3) and 7 cm-7.5 cm (3). *Thais Haemastoma* found in all the study locations where measured to get Length size class (Fig. 3). Results show the most dominant size class to be 3.5 cm-4 cm (31) and 4 cm-4.5 cm (28). Very few had size classes of 2 cm-2.5 cm (1) and 5 cm-5.5 cm (3 cm). *Thais lacera* found in all the study locations where measured to get Length size class (Fig. 4). Results show the most dominant size class to be 4 cm-4.5 cm (31) and 3.5 cm-4 cm (23). Very few had size classes of 2 cm-2.5 cm (4).

Thais sp. found in Calabar study location where measured to get Length size classes (Fig. 5). Results show *Thais coronata* as dominant across most of the different size classes, followed by *Thais haemastoma and then Thais lacera. Thais sp.* found in Nembe study location where measured to get Length size classes (Fig. 6). Results show *Thais coronata* as dominant across most of the different size classes, followed by *Thais haemastoma and then Thais lacera. Thais sp.* found in Bakana study location where measured to get Length size classes (Fig. 7). Results show *Thais coronata* as dominant across most of the different size classes, followed by *Thais lacera.*

3.7 Weight Class Frequency

Thais coronata found in all the study locations where measured to get Weight class (Fig. 8). Results show the most dominant size class or modal class to be 10-11 grams (68) followed by 9-10 grams (55). Very few had weight classes of 3-4 grams (1) and 21-22 grams (1). *Thais Haemastoma* found in all the study locations where measured to get Weight class (Fig.9).

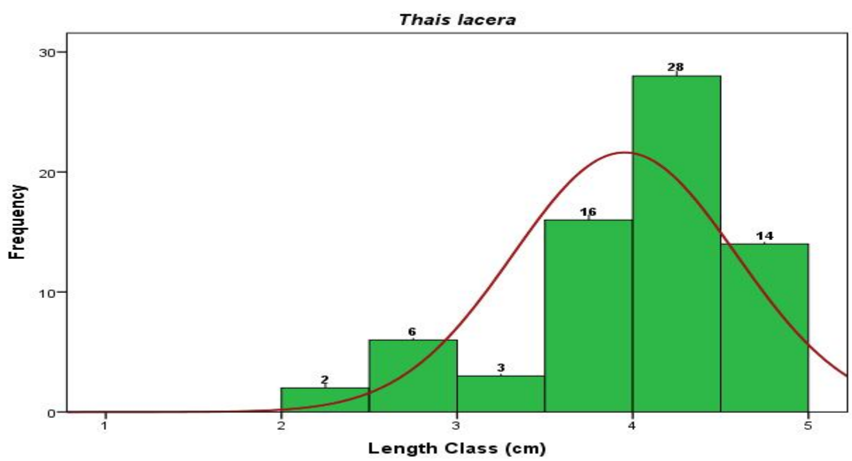

Fig. 4. Length size class of *Thais lacera* found in all the study stations

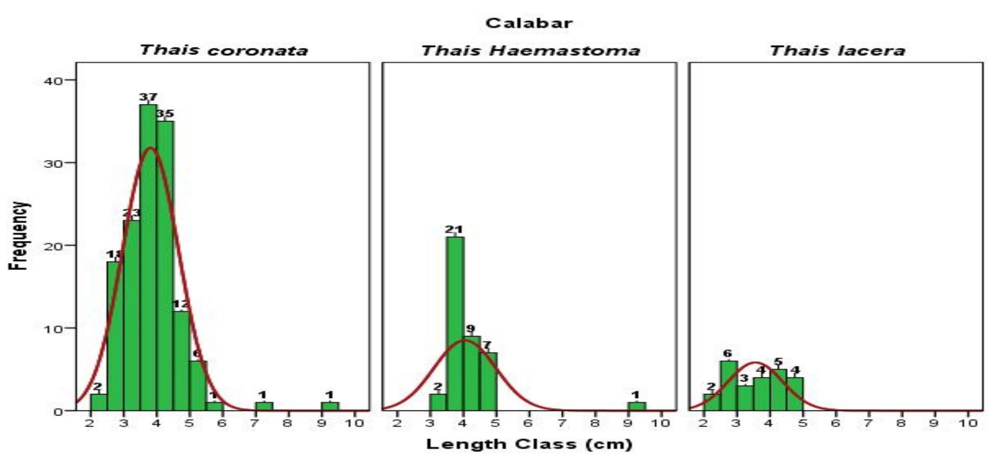

Fig. 5. Length size class of species found in Calabar

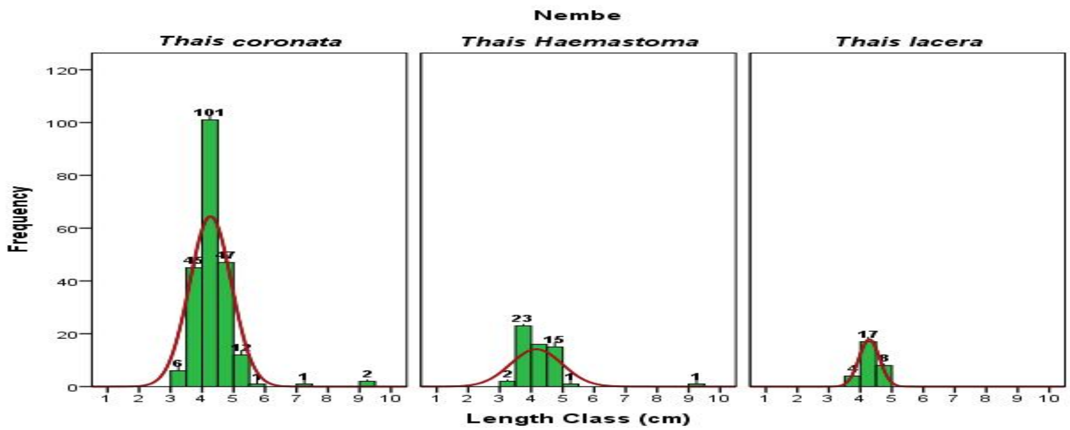

Fig. 6. Length size class of species found in Nembe

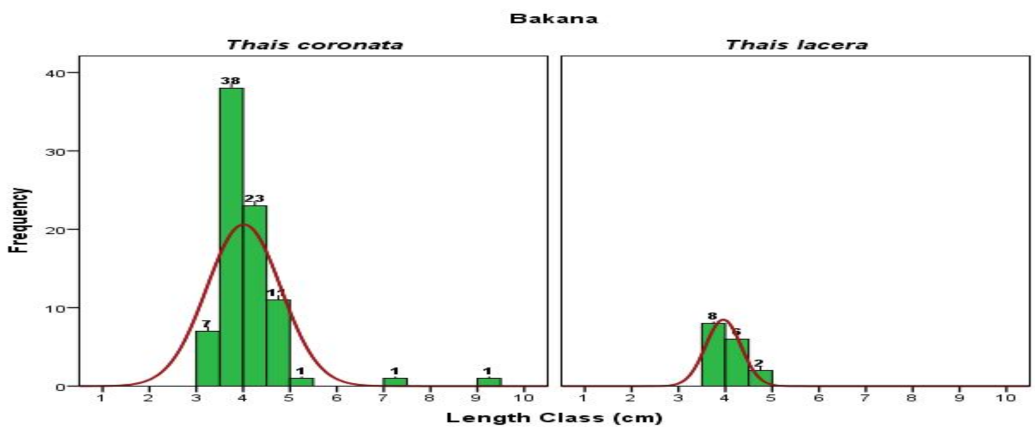

Fig. 7. Length size class of species found in bakana

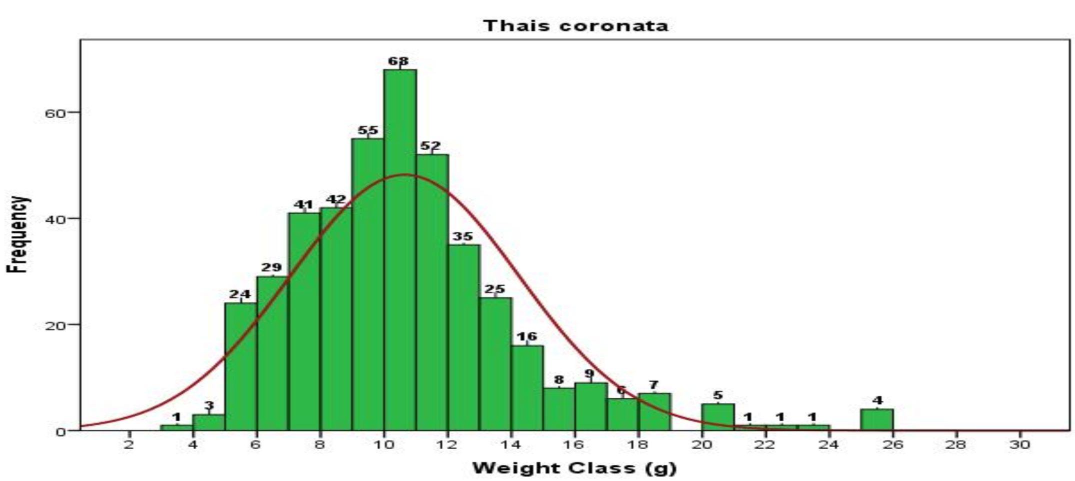

Fig. 8. Weight class of *Thais coronata* found in all the study stations

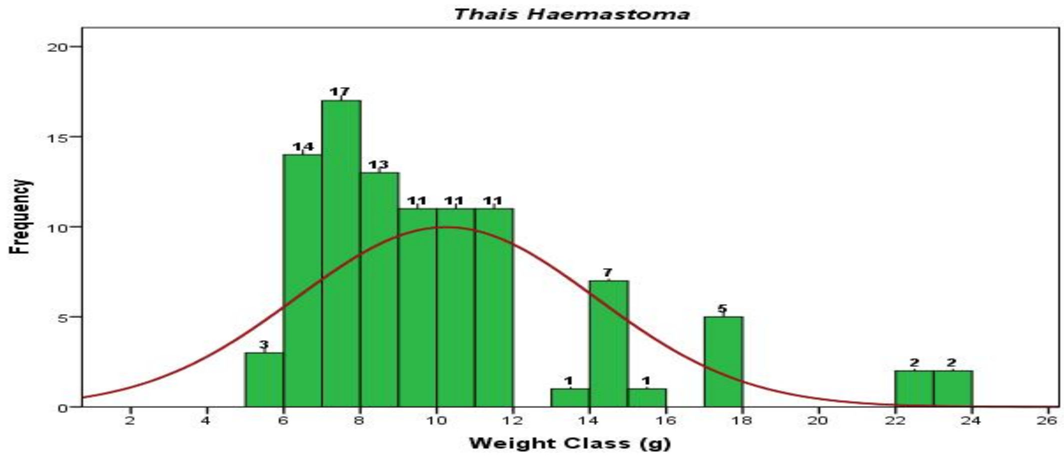

Fig. 9. Weight class of *Thais haemastoma* found in all the study stations

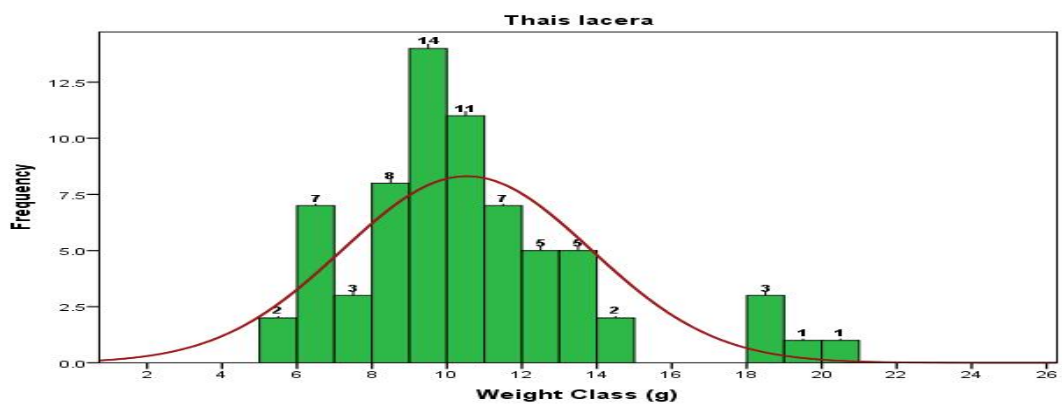

Fig. 10. Weight class of *Thais lacera* found in all the study stations

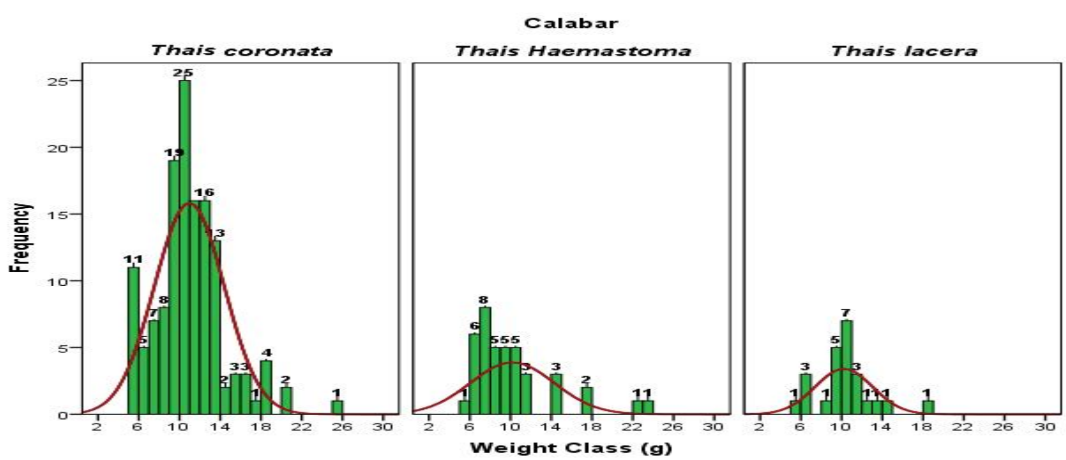

Fig. 11. Weight class of species found in Calabar

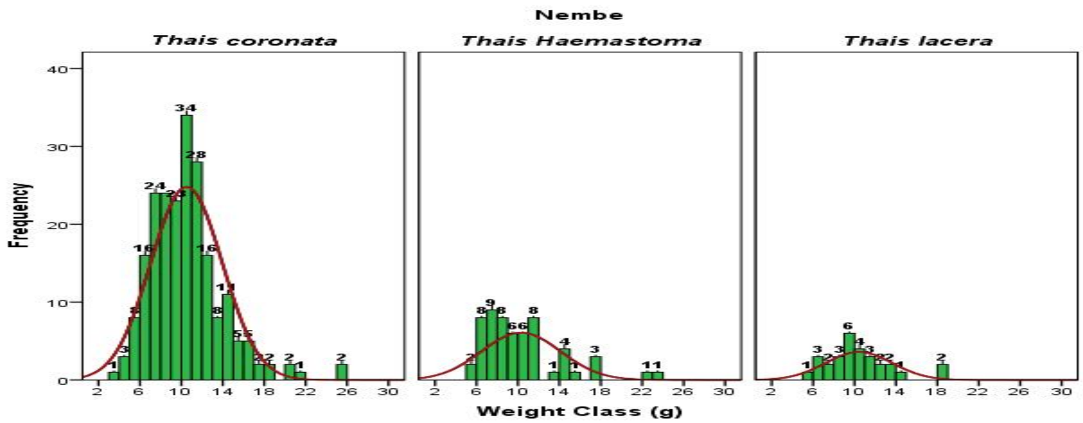

Fig. 12. Weight class of species found in Nembe

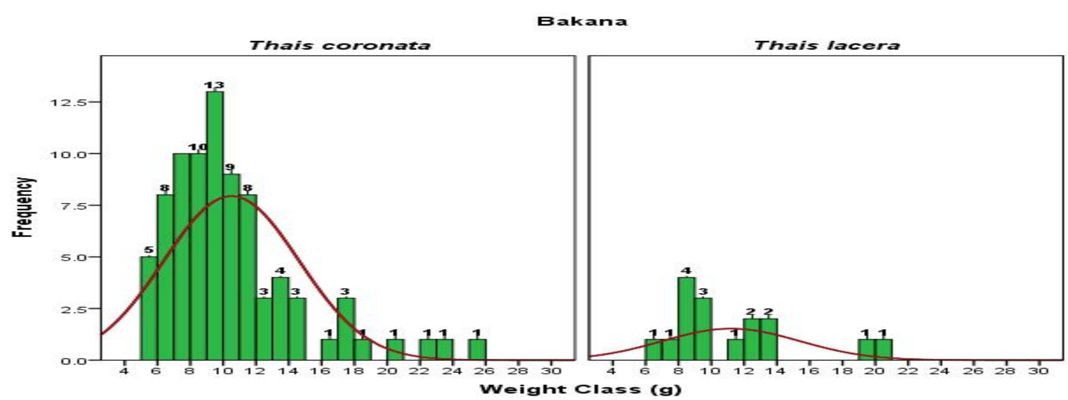

Fig. 13. Weight class of species found in bakana

Results show the most dominant weight class to be 6-7 grams (17) and 5-6 grams (14). Very few had weight classes of 13-14 grams (1) and 15-16 grams (1). *Thais lacera* found in all the study locations where measured to get weight class (Fig. 10). Results show the most dominant size class to be 9-10 grams (14) followed by 10-11 grams (11). Very few had weight classes of 19-10 grams (1) and 20-21 grams (1). The results also show a random distribution of weight classes across species.

Thais sp. found in Calabar study location where measured to get Weight classes (Fig. 11). Results show Thais coronata as dominant across most of the different size classes, followed by Thais haemastoma and then Thais lacera. Thais sp. found in Nembe study location where measured to get Length size classes (Fig. 12). Results show Thais coronata as dominant across most of the different size classes, followed by Thais haemastoma and then Thais lacera. Thais sp. found in Bakana study location where measured to get Length size classes (Fig. 13). Results show Thais coronata as dominant across most of the different size classes, followed by Thais lacera.

3.8 Length and Weight Relationship

The length and weight relationship of the different species across the different locations studied were analyzed The result shows a very weak relationship (RSquare = 0.06) between the weight and the length of *Thais coronata* in Bakana. There is a negative allometric growth (a=0.67) between the weight and the length of *Thais coronata* in Bakana. The result shows a very weak relationship (RSquare = 0.037) between the weight and the length of *Thais coronata* in Calabar. It also shows a negative allometric growth (a=0.84) between the weight and the length of *Thais coronata* in Calabar. The result shows a very weak relationship (RSquare

= 0.057) between the weight and the length of *Thais coronata* in Nembe. It also shows a negative allometric growth (a=0.62) between the weight and the length of *Thais coronata* in Nembe.

The result shows a very weak relationship (RSquare = 0.005) between the weight and the length of *Thais haemastoma* in Calabar. It also shows a negative allometric growth (a=0.87) between the weight and the length of *Thais haemastoma* in Calabar. A very weak relationship (RSquare = 0.062) between the weight and the length of *Thais haemastoma* in Nembe. It also shows a negative allometric growth (a=0.64) between the weight and the length of *Thais haemastoma* in Nembe.

There was a very weak relationship (RSquare = 0.023) between the weight and the length of *Thais Lacera* in Bakana. It also shows a negative allometric growth (a=0.68) between the weight and the length of *Thais Lacera* in Bakana. A very weak relationship (RSquare = 0.02) between the weight and the length of *Thais Lacera* in Calabar was also observed. It also shows a positive allometric growth (a=1.05) between the weight and the length of *Thais Lacera* in Calabar. The result shows a very weak relationship (RSquare = 0.09) between the weight and the length of *Thais Lacera* in Nembe. It also shows a negative allometric growth (a=0.57) between the weight and the length of *Thais Lacera* in Nembe.

A weak relationship (RSquare = 0.03) between the weight and the length of *Thais Coronata* in all locations was observed. It also shows a negative allometric growth (a=0.79) between the weight and the length of all *Thais Coronata*. The result shows a weak relationship (RSquare = 0.0298) between the weight and the length of *Thais haemastoma* in all locations. It also shows a negative allometric growth (a=0.75) between the weight and the length of all *Thais haemastoma.* The result shows a very weak relationship (RSquare = 0.013) between the weight and the length of Thais lacera in all locations. It also shows a negative allometric growth (a=0.899) between the weight and the length of all Thais lacera.

3.9 Morphometric Traits

T. haemastoma had an average shell length of 4.28 cm and Shell width of 3.31 cm, which varied minimally from *T. lacera* and *T. coronata* with shell lengths of 3.95 cm and 4.03 cm and shell widths of 3.38 cm and 3.28 cm respectively.

The disparity between the morphometric traits across the different species identified were minimal as most of the species had similar values of morphometric traits. Differences can be identified using their colour; *thais coronata* (dirty light grey), T *haemastoma* (light grey), and T *lacera* (plane grey) and the number of ridges T. *coronata* (5-27), T. *haemastoma* (8-28) and T. *lacera* lacking ridges

T. *lacera* has the ratio of aperture length (APL) to the body whorl length (BWL) of 0.83 and also aperture length to animal wiegth as 2.41 showing that the aperture length in *T. lacera* is quite large compare to the other species*. T. haemastoma* has the highest ratio of body whorl length to the body width of 0.92 and ratio of shell length (SL) to the aperture length (AL) is 2.83.

This agrees with [10] in their review of gastropods suggested that variations in morphometric traits become obvious as you proceed deeper from the brackish into the oceans as wave exposure has a direct relationship with length of the shell.

3.10 Length and Weight Size Class

The frequency distribution of shell length and Shell weight of the collected Thais snails from the results shows the estimated modal class in the frequency distributions estimated from the three sampling area and the combined data. Thus, the analysis of the modal Length size classes, modal weight size classes and interpretations are based on the combined population sampled across the months of study.

Most of them had a normal distribution. *Thais haemastoma* was absent from the Bakana study Station but had a modal length size class to be 3.5 cm-4 cm (31) and 4 cm-4.5 cm (28) in the two other locations. Very few had size classes of 2 cm-2.5 cm (1) and 5 cm-5.5 cm (3cm). *Thais lacera* found in all the study locations showed a dominant size class of 4 cm-4.5 cm (31) and 3.5 cm-4 cm (23) while, *Thais coronata* found in all the study locations had a dominant size class of 3.5 cm-4 cm (178) and 4 cm-4.5 cm (123).

In Calabar study station, most of the species had a Length size class ranging from 3.5cm to 5cm with *Thais coronata* most dominant across most of the different size classes, followed by *Thais haemastoma and then Thais lacera.* In Nembe study station, most of the species had a modal size class ranging from 3.5cm to 5cm with *Thais* *coronata* most dominant across most of the different size classes, followed by *Thais haemastoma and then Thais lacera.* In Bakana study station, most of the species had a modal size class ranging from 3 cm to 5 cm with *Thais coronata* also the most dominant. In all the surveys of the population structure it was clear that small individuals (<10mm) were generally absent from most of the populations. And in the above size class it was observed that the population of the smaller size class 2.0 cm -2.5 cm of age one and below is very few compare to the size class of 3.5cm-4cm and this is as a result of the fact that the samples are market derived and the fishermen allows the smaller sizes to stay to up to a reasonable size before picking them. while the size class of 4.5 to 5.0 is not seen in the frequency table compared to FAO standard of thais coronata matured size as 0f 5 cm and T. haemastoma standard mature size of 5 cm to 6 cm and this shows that the thais species is an endangered species due to the fact that they are not allowed to get to full maturity and there were no presents of eggs in any of the organism.

The length frequency also showed that T coronata as the dominant species found in the three locations with a size class of 3.5 cm-4.0 cm.

Thais coronata found in all the study locations had a modal weight class of 10-11 grams (68) followed by 9-10 grams (55). Very few had weight classes of 3-4 grams (1) and 21-22 grams (1). *Thais Haemastoma* found in all the study locations had a modal weight class of 6-7 grams (17) and 5-6 grams (14). Very few had weight classes of 13-14 grams (1) and 15-16 grams (1).

Thais lacera found in all the study locations also showed a most dominant size class of 9-10 grams (14) followed by 10-11 grams (11). Very few had weight classes of 19-10 grams (1) and 20-21 grams (1)

3.11 Length-Weight Relationship

The length–weight studies are made to determine mathematically the relationship between two variables and enable prediction of the other variable when one variable is known. As the animal grows it is said that the resultant increase in size, shape, and volume can be measured as length and weight relationship which has become a standard practice in fishery .

It was observed with the aid of length/weight relationship that the found in all study locations exhibited a very weak linear relationship with very low r^2 value across locations. According to Tesh, “If b values equals 3, it shows that the organism has a symmetric or isometric growth pattern while values of b which are more than or less than 3 shows that the fish growth pattern is allometric” [11].

The exponent b of *Thais coronata and Thais haemastoma and T lacera* across the three study locations indicate a negative allometric growth pattern there by not showing any variance from b which is 3 which has been shown that the increase in weight of the animal is not proportionate to the cube of its length and that they maintain specific body shape throughout their life [12].

This can be attributed to the nature of their habitat and their influence of their environment, condition of the growth and shell properties [13], [14]. This also agrees with the study of [15,16] who postulatded that in the temperate regions the growth line of the shell mollusk is said to be a pointer of age whereas at the tropical region due to the lack of distinct season and limited variation of environmental parameters much difference in growth line is not visible.

4. CONCLUSION

Thais, rock shell, dog whelk, dog winkles, ngolo are present on mangrove tree trunks, breathing roots, oyster beds, granite bunds, walls of intertidal monsoon drains, as well as on rocks and boulders on the shore and exhibit both restricted geographical and local distribution. Based on shell morphology alone, it is difficult to differentiate the species belonging to genus Thais because of large amount of plasticity, observed in the shell characters. The colour of the shells are poorly defined as species identifying character in Thais species. Due to lack of taxonomic clarity of the species in the Niger Delta region there is the need to know the different types of the species to help scientific studies currently ongoing in microbiology, biodiversity and parasitology.

The Study has shown that we have three different species of Thais found in the study locations of Nembe, Bakana and calabar. The species were picked randomly at the study sites and are namely *thais coronate, thais Heamastoma* and then *thais lacera.* Their sexual dimorphism and related characteristics, length weight relationship in the study showed that there is no relationship and that the species can be short and rounded but still have weight; it has a negative allometry that shows or indicate a decrease condition or elongation

The modal length class, that shows three modal age, of 0-1, 1year and two years and above with T. coronate the dominant species with a highest modal class.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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