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RESEARCH PAPER

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Biometric characteristics of *Portunus validus* (Herklots, 1851) from Loango Bay, Republic of the Congo

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ABSTRACT

A biometric study was carried out on 121 specimens of *Portunus validus* caught by fishermen in April 2022, in Loango Bay. The objective of this study is to determine the morphometric parameters of this crab species. The results obtained show that the sex ratio in favor of males is equal to 1.47. The total carapace length of the specimens varies between 24.42 and 66.4, with an average of 37.03±12.14. The total width of the carapace of the specimens varies from 21.62 to 175.6 mm with an average of 83.66 ± 23.53 mm while the weight varies between 1.8 and 362 g with an average of 46.80 ± 5.28g. There are variables presenting significant differences with the sex: length of the hand of the large and small cheliped (LM1, LM2), the distance between the external ends of the orbits (Le), the lengths of the merus of the pairs of pereiopods (LMP2, LMP3, LMP4 and LMP5), the widths of the merus of the second (lMP2), third (lMP3) and fifth (lMP5) pairs of pereiopods and the weight. The other variables do not present significant differences at the α=0.05 threshold. The size-height relationships show a diminishing allometry except for the inter-orbital distance; this allometry also differs between males and females. The weight-height relationships show a lowering allometry regardless of the group considered.

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INTRODUCTION

In aquatic ecosystems, crabs constitute a faunal group that play an important economic and bio-ecological role (Cartes *et al.*, 2010). Some species represent an important food resource and are widely exploited in aquatic ecosystems (Babatundé, 2008; Tohozin, 2012; Hinvi *et al.*, 2013; Oluwatoyin *et al.*, 2013; Sankaré, 2014a, 2014b). These species are also used as boindicators of the quality of aquatic environments (Kailola *et al.*, 1993; Brian, 2005; Stentiford and Feist, 2005; Moreira *et al.*, 2006). Others, on the other hand, are intermediate hosts of parasites or a food source for birds and other predatory organisms (Cumberlidge, 2006; Tahir, 2012; Traoré, 2013). In addition to their economic and bioecological roles, the shell of certain crab species is used in the fields: agri-food, agricultural, pharmaceutical, biomedical and cosmetic. This shell is also used in the composition of aquaculture fish and poultry feed (Zouari, 2010).

Despite the important role played by crabs in aquatic ecosystems, there is little data available on this zoological group (Goussanou *et al.*, 2017). At the African level, studies on crabs are in their infancy, we can cite some studies carried out on the following crabs: *Callinectes amnicola*, *Callinectes pallidus Cardisoma armatum*, *Portunus validus*, *Carcinus aestuarii* and the mangrove crab *Scylla serrata* (Akin-Oriola *et al.,* 2005; Lawal-Are and Barakat *et al.,* 2009; Hinvi *et al.,* 2013; D'Almeida *et al.,* 2014; 2015; 2016). *Portunus validus* is a swimming crab of commercial interest, present off the coast of Mauritania as far as Angola in shallow waters between 0 and 50 m deep (Monod, 1956), generally on bottoms made up of shells, muddy sand, fine sand mud or on shells and mud (Buchanan, 1958; Crosnier, 19 64).

Very little information is available on its biology, it should also be noted that there have been few studies on this species because only a few works have been devoted to it (Lawal-Are and Bilewu, 2009; Baron, 1975). In Congo, the scientific literature does not mention any morphometric study of *Portunus validus*. This is how the present study, carried out in Loango Bay (Kouilou Department) for the frst time, aims to provide a first database on biometrics of this important species of edible crab.

MATERIALS AND METHODS

Presentation of the study area

Loango Bay is located in the southwest of the Republic of Congo (Fig. 1), precisely in the Kouilou Sub-Prefecture. It is located on the Atlantic coastline 20 km north of the city of Pointe-Noire and extends from the mouth of the Kouilou River to Cap de Loango or Indian Point (Koubouana *et al.*, 2014).

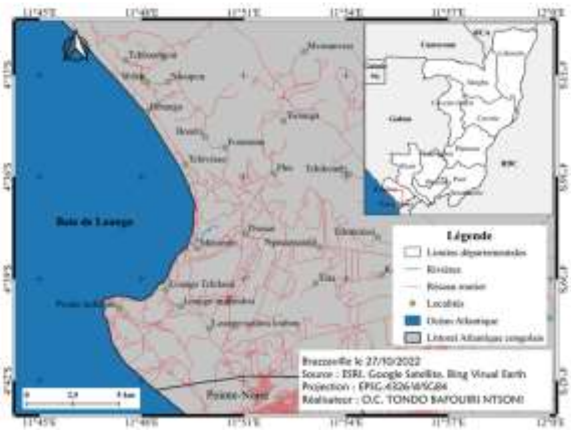

Fig. 1. Carte de localisation de la zone d'étude

Material

The biological material consists of crabs caught in Loango Bay, which were purchased from fishermen.

Sampling

The crab specimens were captured with a shore seine by fishermen in April 2022. The specimens were immersed in a 10% formaldehyde solution for fixation and transferred the next day to tanks containing 5% formalin for conservation.

Identification and sexing

The identification of the specimens was done according to the key proposed by Schneider (1992). The sexing of each specimen of *Portunus validus* was done by observing the shape of the abdomen which is rounded in the female and tapered in the male. Thus, the sex ratio was calculated according to the formula:

SR=Nm/Nf

where Nm is the number of males and Nf is the number of females.

Specimen measurements

Each crab specimen was weighed using an Ohaus brand scale with a precision of 0.001g. A series of measurements were carried out using a Stanless brand caliper (Fig. 2). Twenty-one metric characters were recorded on each specimen of *Portunus validus* (Duarte *et al.*, 2008).

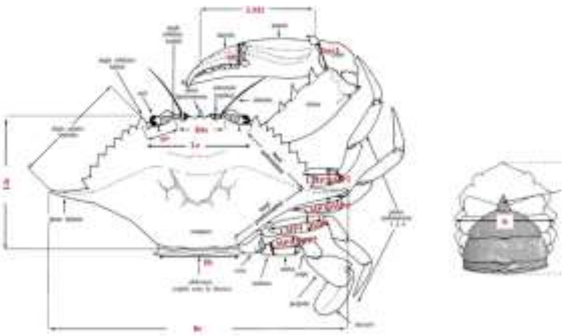

Fig. 2. Mains measurements used for crab characterization

LM1: Length of the hand of the large cheliped;
LM2: Length of the hand of the small cheliped not shown (symmetrical to LM1);
ld1: Width of the large orchardgrass;
ld2: Width of the small orchard not shown (symmetrical to ld1);
lapc1: Width of the joint between the propodus and the carpus of the large cheliped;
lapc2: Width of the articulation between the propodus and the carpus of the small cheliped not shown (symmetrical to lapc1);
Do: Diameter of the orbits;
Dio: Distance between eye sockets;
Le: Length between the ends of the eye sockets;
ltc: Total width of the carapace;
Ltc: Total length of the carapace;
lfc: Final width of the carapace;
LMP2: Length of the merus of the second pair of pereiopods;
LMP3: Length of the merus of the third pair of pereiopods;
LMP4: Length of the merus of the fourth pair of pereiopods;
LMP5: Length of the merus of the fifth pair of pereiopods;
lMP2: Width of the merus of the second pair of pereiopods;
lMP3: Width of the merus of the third pair of pereiopods;
lMP4: Width of the merus of the fourth pair of pereiopods;
lMP2: Width of the merus of the fifth pair of pereiopods;
ls: Width of the sternum.

Numerical abundance

Numerical abundance An = (n/Nt) x 100, where n is the number of individuals in a taxonomic group (species, family or order); Nt corresponds to the total number of individuals (N'zi *et al.,* 2008).

Size structure

The size class distribution of *Portunus validus* was done using Sturges' rule (Scherrer, 1984).

The number of classes NC = 1+3.3logN; N is the total number of specimens measured. From the number of classes thus found and the maximum and minimum total carapace lengths (Ltc) of the specimens, the interval of classes I = LCmax - LCmin/NC.

Growth parameters

The morphometric data were standardized in order to study the variations linked to the age difference between the specimens. This standardization is based on the allometric relationships between the morphological data and the total carapace width. All measurements expressed in millimeters were converted into a percentage of standard length which in the case of crabs corresponds to the total width of the carapace (Mayr, 1970). Relative growth is defined according to the equation y = axb. The value y represents the dimension of the organ studied and x the dimension of the reference organ, b which corresponds to the slope or allometry coefficient and a initial growth coefficient, are constants (Zar, 1999).

When it comes to the size-height relationship, several growth modalities are defined according to the value of the allometry coefficient b which is compared to 1 (Shingleton, 2010). When b = 1, relative growth is isometric and b ≠ 1, there is allometry. When b < 1, the allometry is lower. When b > 1, the allometry is increasing. In the case of the length-weight relationship, the weight then represents a volume, the coefficient b is compared to 3. When b = 3, the growth is isometric, b ≠ 3, there is allometry. When b > 3, the allometry is increasing; when b < 3, the allometry is lower.

The statistical difference between the value of b and the isometric value was verified using the Student's t test at the significance threshold α = 0.05 (Sokal and Rohlf, 1987):

$$t = \frac{b - isometric\ value}{ESb}$$

With, t = the t value of the Student's t test; b = the slope of the regression line; ESb = the standard error of b.

Coefficient of variation (CV)

It is the percentage of the standard deviation ratio, it is calculated using the following formula:

$$CV=100(\frac{σi}{μi})x100$$

With, σi = the standard deviation of variables i for the group considered; $μi$ = the average of variables i for the group considered. The coefficient of variation (CV) makes it possible to evaluate the variations of a trait within a group of individuals. So, when it is less than 2%, the group is very homogeneous. When the CV value is between 2 and 25%, the group is homogeneous. On the other hand, when it is greater than 25%, the group is heterogeneous.

Statistical analyzes

These are descriptive statistics such as the mean, standard error of the mean, standard deviation, range and coefficient of variation (CV) of different traits. They make it possible to highlight the limits of character variation within populations (Tshibwabwa, 1997). The Mann-Whitney-Wilcoxon test is applied to compare the variables between sexes (Zar, 2010).

The standardized metric data were subjected to univariate (descriptive statistics and test statistics) and multivariate statistical analyses. The descriptive statistics were carried out using the Past software (v. 3) and the Excel spreadsheet (v. 2016), the statistical tests were carried out using the R software (v. 4.1.2.) and of its RStudio interface (v. 0.99.903.).

RESULTS AND DISCUSSION

Sex ratio

Males represent 72 specimens out of the 121 crabs collected, the sex ratio is in favor of males and equal to 1.47. It is significantly different from equitable distribution (X^2 test $p < 0.05$).

These results are similar to those of Baron (1975) on the Senegalese coasts which, in *Portunus validus*, favors males and Moruf and Lawal-Are (2017) on the Lagos Coast, Nigeria. However, it differs from that of Lawal-Are and Bilewu (2009) on the Nigerian coasts which, in *P. validus*, favors females. These variations in sex ratio show that males and females prefer different habitats (Rohmayani *et al.,* 2002).

Metrics and coefficient of variation of *Portunus validus*

The different measurements taken on the crabs are recorded in Table 1. Overall, the total width of the carapace of the specimens varies from 21.6 to 175.6 mm with an average of 75.06 ± 21.51mm. In males, the carapace length varies between 38.21 and 66.06 mm, an average of 44.68 ±5.25 mm; in females, the carapace length varies between 24.42 and 66.84 mm, an average of 44.15±12.8 mm. The weight of the specimens overall varies between 1.8 and 362 g with an average of 46.80 ± 5.28g. In males, the weight varies between 4.60 and 68.38g, an average of 42.21±14.93g; In females, weight fluctuates between 1.80 and 362g, for an average of 53.35±5.28g. The weight of male specimens is significantly lower than that of females. This result is opposed to that of Laware-Are and Bilewu (2009) found in *P. validus* as well as those of Rohmayani *et al.* (2002) and Haputhantri *et al.* (2021) found in *P. pelagicus*. This difference noted in *P. validus* could be explained by sampling fluctuations as shown by the range of weight data for females which is 360.2 g compared to 63.783 g for males.

Table 1. Crab morphometry

S	N	Carapace Length (mm)				Carapace width (mm)				Weight (g)			
		Min	Max	Mean±SD	SE	Min	Max	Mean±SD	SE	Min	Max	Mean±SD	SE
M	72	38,21	66,06	44,68±5,25	0,54	42,65	110,71	85,05±14,94	10,16	4,60	68,38	42,21± 14,93	1,76
F	49	24,42	66,84	44,15±12,8	0,62	21,62	175,6	81,56±32,36	4,72	1,80	362	53,55 ± 5,28	12,80
All	121	24,42	66,84	37,03±12,14	0,99	21,62	175,6	83,64±23,53	2,14	1,80	362	46,80 ± 5,28	5,28

Table 2. Variance metric data of *Portunus validus*

Metric variables (%)	Statistics	Combined	Females	Males
LM 1	Moyenne ± ES	46,72 ± 0,97	44,11 ± 1,92	48,49 ± 0,92
	ET	7,82	13,42	7,82
	Min-Max	24,76 - 127,9	24,76 - 127,9	26,45 - 84,81
	CV (%)	16,12	30,43	16,12
LM 2	Moyenne ± ES	44,33 ± 0,94	41,8 ± 1,87	46,06 ± 0,89
	ET	7,52	13,11	7,52
	Min-Max	24,3 - 124,43	24,3 - 124,43	26,38 - 83,46
	CV (%)	16,33	31,35	16,33
ld 1	Moyenne ± ES	7,8 ± 0,22	7,88 ± 0,34	7,75 ± 0,29
	ET	2,48	2,41	2,48
	Min-Max	3 - 20,93	3 - 19,89	4,19 - 20,93
	CV (%)	32,05	30,55	32,05
ld 2	Moyenne ± ES	7,13 ± 0,22	7,37 ± 0,37	6,97 ± 0,28
	ET	2,39	2,57	2,39
	Min-Max	2,91 - 19,92	2,91 - 19,47	3,15 - 19,92
	CV (%)	34,27	34,92	34,27
lapc 1	Moyenne ± ES	7,92 ± 0,17	7,76 ± 0,27	8,04 ± 0,22
	ET	1,87	1,90	1,87
	Min-Max	4,88 - 18,61	4,88 - 17,3	4,97 - 18,61
	CV (%)	23,29	24,47	23,29
lapc 2	Moyenne ± ES	7 ± 0,16	6,75 ± 0,28	7,16 ± 0,2
	ET	1,69	1,97	1,69
	Min-Max	2,56 - 17,41	2,56 - 16,88	4,75 - 17,41
	CV (%)	23,53	29,25	23,53
Do	Moyenne ± ES	3,73 ± 0,07	3,86 ± 0,14	3,63 ± 0,08
	ET	0,87	0,95	0,67
	Min-Max	2,1 - 8,83	2,2 - 8,83	2,1 - 5,49
	CV (%)	23,61	24,66	18,52
Dio	Moyenne ± ES	17,73 ± 0,38	18,23 ± 0,64	17,4 ± 0,46
	ET	3,89	4,48	3,89
	Min-Max	8,78 - 27,6	8,78 - 27,6	11,21 - 24,86
	CV (%)	22,36	24,56	22,36
Le	Moyenne ± ES	35,97 ± 0,59	37,19 ± 0,64	35,13 ± 0,89
	ET	7,52	4,49	7,52
	Min-Max	12,68 - 59,52	21,89 - 48,96	12,68 - 59,52
	CV (%)	21,41	12,08	21,41
Ltc	Moyenne ± ES	44,47 ± 0,54	44,15 ± 0,99	44,69 ± 0,62
	ET	8,02	6,94	5,25
	Min-Max	24,42 - 66,84	24,42 - 66,84	38,21 - 66,06
	CV (%)	17,73	15,72	11,75
lfc	Moyenne ± ES	25,12 ± 0,35	25,41 ± 0,64	24,92 ± 0,4
	ET	3,42	4,50	3,42
	Min-Max	17,78 - 50,21	17,78 - 50,21	20,05 - 37,41
	CV (%)	13,73	17,72	13,73
LMP 2	Moyenne ± ES	22,49 ± 0,43	21,1 ± 0,64	23,44 ± 0,55
	ET	4,69	4,47	4,69
	Min-Max	11,89 - 42,95	11,89 - 42,95	16,72 - 39,17
	CV (%)	20,00	21,18	20,00
LMP 3	Moyenne ± ES	20,01 ± 0,44	18,85 ± 0,69	20,8 ± 0,55
	ET	4,69	4,85	4,69
	Min-Max	4,35 - 36,37	8,47 - 36,37	4,35 - 34,92
	CV (%)	22,57	25,72	22,57

lMP 4	Moyenne ± ES	6,03 ± 0,13	5,99 ± 0,22	6,06 ± 0,16
	ET	1,39	1,51	1,39
	Min-Max	2,64 - 12,67	2,64 - 10,94	3,58 - 12,67
	CV (%)	22,99	25,22	22,99
lMP 5	Moyenne ± ES	8,44 ± 0,18	8,12 ± 0,34	8,66 ± 0,19
	ET	1,64	2,36	1,64
	Min-Max	3,73 - 18,59	3,73 - 18,59	5,52 - 15,39
	CV (%)	18,94	29,12	18,94
Ls	Moyenne ± ES	39,06 ± 0,56	38,33 ± 0,84	39,56 ± 0,74
	ET	6,24	5,89	6,24
	Min-Max	6,17 - 53,77	7,97 - 51,08	6,17 - 53,77
	CV (%)	15,79	15,37	15,79

The coefficient of variation of the metric data makes it possible to identify homogeneous and non-homogeneous groups (Table 2). This CV varies from 13.73 to 34.27% in the population, from 12.08 to 34.92% in females and from 11.75 to 34.27% in males. In the population, variables such as ld 1, ld 2 and LMP 4 have CV > 25%. In females, half of the variables (LM 1, LM 2, ld 1, ld 2, lapc 2, LMP 3, LMP 4, lMP 2, lMP 4 and lMP 5) have CV > 25%. In males, the variables ld 1, ld 2 and LMP 4 have CV > 25%. Table 2 presents the results of the descriptive statistics of the metric variables of the sample studied.

Comparison of metric data based on the sex

The Wilcoxon-Mann-Whitney test made it possible to discriminate 11 variables presenting significant differences with the sex (Table 3). These variables are the lengths of the hands (LM1 and LM2), the distance between the external ends of the orbits (Le), the lengths of the merus of the pairs of pereiopods (LMP2, LMP3, LMP4 and LMP5), the widths of the merus of the second (lMP2), third (lMP3) and fifth (lMP5) pairs of pereiopods and weight. We see that the weight (Wgt) of females is significantly higher than that of males. The other variables do not present significant differences at the α=0.05 threshold. These results differ from those obtained by Duarte *et al.* (2008) in *Cardiosoma guanhumi*; this author does not note any intersexual differences for these parameters. The coefficient of variation reveals the existence of strong morphometric variations for the width of the dactyls and the length of the merus of the fourth pair of pereiopods. In males, only these three characters show heterogeneity. In females, however, the length of the hands, the width of the left joint between the propod and the carpus, the length of the merus of pereiopods 3 and 4 as well as the width of merus 2, 4 and 5, are added to the parameters marking heterogeneity. The heterogeneity of the different groups could thus reflect the presence of specimens with different levels of sexual maturity.

Table 3. Wilcoxon- Mann-Whitney test on the metric characters of *Portunus validus*

Variables (%)	N	Test de Wilcoxon-Mann-Whitney	
		W	*p*-value
LM 1	121	780	***
LM 2	121	810	***
ld 1	121	1363,5	NS
ld 2	121	1445,5	NS
lape 1	121	1009,5	NS
lape 2	121	906,5	NS
Do	121	1354,5	NS
Dio	121	1512,5	NS
Le	121	1513	**
Ltc	121	994.5	NS
lfc	121	1158	NS
LMP 2	121	787	***
LMP 3	121	894	***
LMP 4	121	822	**
LMP 5	121	864,5	*
lMP 2	121	852	**
lMP 3	121	859,5	**
lMP 4	121	1147,5	NS
lMP 5	121	950,5	*
ls	121	844	NS
Wgt	121	879	***

p = probability, *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$; NS: Not Significant ($p > 0.05$)

Size structure

Portunus validus specimens were divided into 17 size classes (Fig. 3). The modal class is class 8 with 46 individuals whose total carapace length varies from 41.65 to 44.14cm. Due to the low number of individuals, certain size classes have been merged, these are classes 1-2-3; grades 5-6; classes 10-11-12 and classes 15-16-17.

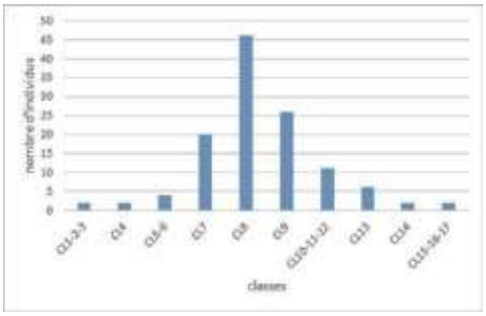

Fig. 3. Size structure of *P. validus*

The size structure according to sex in *P. validus* shows that males are distributed into 15 classes, the interval is 4.25 and the modal class is class 3. On the other hand, females are distributed into 14 classes including the interval is 26, class 7 is the modal class, corresponding to large specimens whose size is between 78.12 and 110.72 mm (Fig. 4).

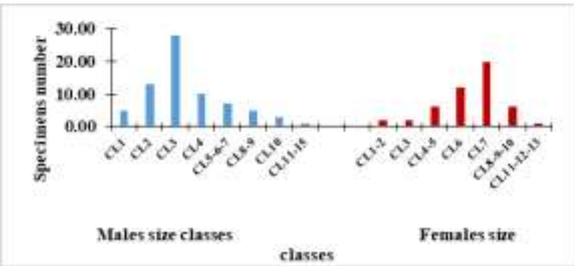

Fig. 4. Size structure according to the sex of *P. validus*

Correlation between metrics at *Portunus validus*

Fig. 5 shows the Pearson correlogram of the different metric variables in percentage of total carapace width. Pearson correlation coefficients are colored blue when they are positive and red when they are negative. The intensity of the color is proportional to the correlation coefficient, the darker the Pearson coefficient, the stronger the correlations. We mainly note weak linear correlations (r < 0.3) between the inter-orbital distance and all other measured metric variables.

Growth parameters of *Portunus validus*

The growth of the specimens studied made it possible to draw curves presenting the evolution of the weight and dimensions of the different parts of the carapace in relation to its total width taken as a reference measurement. These are all curves with the equation $y = ax^b$ whose value of the coefficient b justifies the growth of the organ studied. These correlations show strong correlations between the different parts measured. Indeed, all the correlation coefficients obtained are greater than or equal to 0.6665 with the exception of the relationships Dio/ltc and Le/ltc in males the correlation is weak (r = 0.4705 and r = 0.3615).

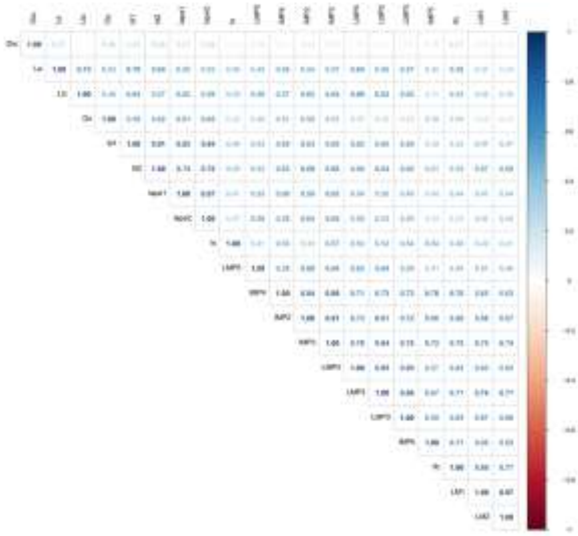

Fig. 5. Correlogram of the different metric variables studied

The allometry coefficients obtained for the height-height lines are relatively high, but all less than 1 (Table 4) in the entire population. For the relationships Le/ltc, lfc/ltc and Ltc/ltc, the allometry coefficient is significantly different from the reference value 1. Growth is therefore allometric undermining. However, with regard to the Dio/ltc relationship, this coefficient is not significantly different from the reference value 1. Which implies isometric growth. All size-height relationships for females indicate isometric growth because the allometry coefficient is not significantly different from 1. However, they indicate diminishing allometric growth in males because the allometry coefficient is significantly different from 1.

For the height-weight lines, the allometry coefficients lower than the reference value 3 are significantly different (Table 2). Which implies a decreasing allometric growth regardless of the group taken into consideration. This table gives information on the comparison of the allometry coefficients obtained with the reference values using the Student *t*-test.

Table 4. Significant differences in allometry coefficients according to the Student *t*-test

Relations	N	a	b	SE(b)	Réf	*t*	*p*	Growth	R^2	r
Dio/ltc All	121	0,345	0,843	0,71	1	-0,221	NS	Is	0,46	0,69
Dio/ltc Male	72	0,563	0,729	0,12	1	-2,258	*	A^-	0,221	0,47
Dio/ltc Female	49	0,272	0,901	0,09	1	-5,983	NS	Is	0,62	0,79
Le/ltc All	121	0,855	0,799	0,06	1	-3,350	***	A^-	0,651	0,81
Le/ltc Male	72	4,703	0,408	0,12	1	-4,933	***	A^-	0,130	0,36
Le/ltc Female	49	0,395	0,985	0,05	1	-6,320	NS	Is	0,93	0,96
lfc/ltcAll	121	0,397	0,894	0,04	1	-2,650	**	A^-	0,832	0 ,91
lfc/ltc Male	72	1,212	0,641	0,06	1	-5,983	***	A^-	0,557	0,75
lfc/ltc Femelle	49	0,248	1,003	0,06	1	-4,933	NS	Is	0,946	0 ,97
Ltc/ltc All	121	0,687	0,899	0,04	1	-2,525	**	A^-	0,793	0,89
Ltc/ltc Male	72	1,798	0,684	0,05	1	-6,320	***	A^-	0,676	0,82
Ltc/ltc Female	49	0,479	0,978	0,06	1	-1,100	NS	Is	0,857	0,92
W/ltc All	121	0,003	2,131	0,15	3	-5,793	***	A^-	0,654	0,81
W/ltc Male	72	0,006	1,968	0,21	3	-4,914	***	A^-	0,444	0,67
W/ltc Female	49	0,002	2,149	0,23	3	-3,700	***	A^-	0,695	0,83
W/Ltc All	72	0,010	2,26	0,13	3	-9,449	***	A^-	0,71	0,84
W/Ltc Male	49	0,0005	3,08	0,15	3	-4,914	***	Is	0,86	0,93
W/Ltc Female	121	0,018	2,09	0,23	3	-5,730	***	A^-	0,69	0,83

p: probability, *: $p < 0.05$; **: $p < 0.01$; ***: $p < 0.001$; NS: Not Significant ($p > 0.05$)

A- = Minor allometry; Is = Isometry

The weight of males, females and the total population increases less quickly than the total width of the carapace in *P. validus* as evidenced by the allometry coefficients. Additionally, these allometry coefficients appear to show slightly faster weight growth in females than in males. These results are consistent with those of Hinvi *et al.* (2013) for specimens of *P. validus* fed on natural production and dietary supplementation. They are also consistent with those of Lawal-Are and Bilewu (2009) and those of Lawal-Are and Nwankwo. (2011) found on specimens of *P. validus* on the coast of Lagos, Nigeria. However, it should be noted that these authors note an increased allometric growth for females. However, the results of the present study differ from the allometric growth increase slightly in favor of males found by Haputhantri *et al.* (2021) for specimens of *P. pelagicus* in Sri Lanka. The diversity of these results confirms the fact that a certain number of factors such as sex, environment, food availability and eating habits would influence allometric relationships (Rohmayani *et al.,* 2002). The weight of male specimens is significantly lower than that of females. This result is opposed to that of Lawal-Are and Bilewu (2009) found in *P. validus* as well as those of Rohmayani *et al.* (2002) and Haputhantri *et al.* (2021) found in *P. pelagicus*. This difference noted in *P. validus* could be explained by sampling fluctuations as shown by the range of weight data for females which is 360.2 g compared to 63.783 g for males.

CONCLUSION

This first one-off morphometric study of *Portunus validus* in congolese coastal area showed a sex ratio The metric data made it possible to highlight variability within the *Portunus validus* population. The growth of the different parts of the carapace is allometric undermining, this growth is isometric in females and allometric undermining in males. The existence of isometric growth in females shows that in the latter, weight and size are closely correlated.

As for growth, the latter is allometric undermining, whether for the population or in males as in females. However, this study must be completed by more samplings realized in different sites during dry and rainy season for a better comprehension of *Portunus validus* bioecology.

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