**Supplementary material**

**Life history parameters of the crocodile shark, *Pseudocarcharias kamoharai*, in the tropical Atlantic Ocean**

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Maturity assignment and reproductive organs dimensions

For males, paired-structure measurements were not normally distributed (Lilliesfors test; inner clasper: D=0.13, *P*<0.001; outer clasper: D=0.10, *P*<0.001; testis width: D=0.08, *P*<0.001; testis length: D=0.07, *P*<0.001; testis weight: D=0.09, *P*<0.001; seminal gland width: D=0.11, *P*<0.001) but variances were homogeneous between the right and left side structure (Levene test; inner clasper: F=0.13, df=1, *P*>0.05; outer clasper: F=0.52, df=1, *P*>0.05; testis width: F=0.0007, df=1, *P*>0.05; testis length: F=0.16, df=1, *P*>0.05; testis weight: F=0.002, df=1, *P*>0.05; seminal gland width: F=2.91, df=1, *P*>0.05).

No significant difference was found between left and right side clasper inner (permutation test: Z=0.88, *P*>0.05) or outer length (permutation test: Z=0.55, *P*>0.05), testis width (permutation test: Z=0.44, *P*>0.05), length (permutation test: Z=0.88, *P*>0.05) or weight (permutation test: Z=0.008, *P*>0.05), however a difference was found for seminal gland width (permutation test: Z=2.31, *P*<0.05). Therefore, mean values were calculated, except for testis weight and seminal gland width, and plotted against FL so that relative growth of the structure with specimen size could be observed (Figure S1). In the case of testis weight, left and right-side weight was summed and the total weight plotted against FL (Figure S1), for the seminal glands as differences were found between the left and right structure this was not plotted against FL.

There is a clear relationship between clasper length and FL, with an increase in length once the specimens are maturing, immature individuals present small and uncalcified claspers, while large individuals present large and calcified claspers (Figure S1). The increase in clasper size seems to occur before calcification, as some individuals present large claspers without calcification. Testis width, length and weight also seem to increase with increasing FL, however not as denoted as in claspers size, as some individuals presented larger and heavier testis despite being immature, while the opposite also occurred, with larger mature individuals presenting smaller and lighter testis. Oliveira et al. (2010) reported similar results and defined that clasper size and calcification were the most suitable characteristics to base maturity for this species; hypothesizing that testis mass was more variable because mature males could be in a resting phase, therefore having smaller and lighter testis.

For females, paired-structure measurements were not normally distributed (Lilliesfors test; uterus width: D=0.28, *P*<0.001; oviductal gland width: D=0.10, *P*<0.001) but variances were homogeneous between the right and left side structure (Levene test; uterus width: F=0.28, df=1, *P*>0.05; oviductal gland width: F=0.47, df=1, *P*>0.05)

No significant difference was found between left and right-side uterus width (permutation test: Z=0.41, *P*>0.05), or the oviductal gland width (permutation test: Z=0.31, *P*>0.05). Since there was no difference between right and left side structures, mean values were calculated and plotted against FL (Figure S2).



Figure S1 **-** Relationship between fork length (FL) and clasper inner and outer length (mm), testis length (mm), width (mm) and weight (g) for male *Pseudocarcharias kamoharai* collected in the tropical Atlantic Ocean.

Ovary width, length and weight was also plotted against FL (Figure S2). A clear relationship can be observed between all structures and FL. Immature specimens present relatively small structures despite the increase in FL, while in mature specimens the structures remain relatively narrow and small for females that are not pregnant or increase substantially in the case of pregnant females. Oliveira et al. (2010) found similar results and reported that all these structures together with the analysis of uterine content were suitable to assign maturity stages in crocodile shark.



Figure S2 - Relationship between fork length (FL) and ovary width (mm), length (mm) and weight (g), uterus width (mm) and oviductal gland width (mm) for female *Pseudocarcharias kamoharai* in the tropical Atlantic Ocean.

References

**Oliveira P, Hazin FHV, Carvalho F, Rego M, Coelho R, Piercy A and Burgess G** (2010) Reproductive biology of the crocodile shark *Pseudocarcharias kamoharai*. *Journal of Fish Biology* **76**, 1655–1670.