
Linear growth of two oceanic sharks, *Prionace glauca* (blue shark) and *Carcharhinus falciformis* (silky shark) in the south western Indian Ocean assessed by back-calculation from vertebrae age readings

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Abstract

A total of 190 blue sharks (36-275 cm fork length, FL) and 208 silky sharks (51-264 cm FL) were collected in the southwest Indian Ocean in 2009-2010. Whole and sectioned vertebrae were used for age determination. The relationship between fish length and vertebrae radius in particular age was developed for back-calculation of the length-age matrix. For both species the adjusted isometric model was significant, explaining 97% (*C. falciformis*) and 98% (*P. glauca*) of variance. von Bertalanffy's growth model was adjusted to back-calculated lengths at age. Our results revealed that the blue and the silky sharks' species had a relatively slow growth, attaining an average asymptotic size of about 250cm FL at an age of over 15 years. Models indicated that none of von Bertalanffy's growth parameters significantly differed among males and females. For the blue shark, a significant effect of sex could be detected by the non-linear mixed effect model (NLME): males grow faster than females as commonly occur among shark species. No significant effect of sex on growth for the silky shark was detected. Final models indicated individual growth parameters ranging from -1.94 to -0.07 years for t₀, 0.086 to 0.215 year⁻¹ for k, 201 to 343 cm FL for in *P. glauca*, and from -3.69 to -1.56 years for t₀, 0.056 to 0.082 year⁻¹ for k, 291 to 357 cm FL for in *C. falciformis*. The difference between the life history traits for both blue shark and silky shark populations are discussed.

Keywords: pelagic longline, purse seine, bycatch, life history traits, von Bertalanffy's growth model, NLME

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