

Growth in *Melanosuchus niger* and *Caiman crocodilus crocodilus* at Zancudococha and Cuyabeno, Ecuadorian Amazon.

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Introduction. Crocodylians undergo a spectacular size change during their life. Abercrombie (1987) states that *Alligator mississippiensis* can achieve 7000% his hatchling weight as an adult. *Melanosuchus niger* and *Caiman crocodilus* show a similar trend.

As we can imply from that sort of changes, many aspects of their natural history and ecology are closely related to their size: type of prey (Magnusson et al. 1987, Asanza 1991), competition groups (Vallejo 1995), mortality (Woodward et al. 1987), only to name a few.

Thereby, it is very helpful to know the growth rates of the animals in order to understand the population dynamics of the species, and to have insight to some important management and conservation subjects. For example, Rebêlo and Magnusson (1983) present a most interesting hypothesis to explain the diminishing in *M. niger* populations when they are exposed to sever hunting pressure, while *C. crocodilus* tolerate it much better.

Based on hunted skins sizes and some data on growth of both species, they suggest that *M. niger* spends 2 to 3 years at a size range that hunters prefer, before sexual maturity, which it achieves between 1.8 and 2.0 m. in total length (Rêbêlo and Magnusson 1983, Ross and Magnusson 1989, Herron 1991), while *C. crocodilus* will be at that range for far less time. This will make it harder for *M. niger* populations to recruit new reproductive individuals under hunting pressure than it is for *C. crocodilus* ones.

Herron (1991), based on growth data from a sample of both species, extended that hypothetical time span to 4.5 to 6 years for *M. niger*.

The results of our study suggest that that period could be even longer.

Methods. From August 1992 to January 1995, 105 different individuals of *C. crocodilus* and 146 of *M. niger* were captured, marked, measured and released in three black water lagoons of Ecuadorian Amazon: Cuyabeno, Zancudococha and Imuya). Because many animals had incomplete tails, the snout-vent length (SVL) of every animal was measured. Then, a lineal regression was calculated between the snout-vent length and the total length of all those animals with complete tail:

for *M. niger*, $ETL = (SVL + 1.4886) / 0.4876 \quad r \approx 1$,

and for *C. crocodilus*, $ETL = (SVL + 0.7793) / 0.5063 \quad r \approx 1$.

This regressions were applied to every snout-vent length for calculating the expected total length (ETL), with which analysis were made.

In order to reduce measuring error, only recaptures with 90 or more days of interval were included in the analysis. These were 8 recaptures for *C. crocodilus* and 23 for *M. niger* (96% of the data for *M. niger* comes from Zancudococha, locality in which this species is dominant in a 9:1 proportion over *C. crocodilus*).

For normalizing growth to cm of expected total length increment/year, no difference on growth throughout the year was assumed.

Results and discussion. Growth variation among individuals was large in the two species.

C. crocodilus presented growth rates between 3.59 and 34.33 cm/year (always ETL), with an average growth of 13.61 cm/year. Notice that the extreme values were found on individuals of the same initial length (104.54 and 104.25 cm respectively) and sex: males (table I).

For *M. niger* normalized growth rates were between 1.72 and 25.13 cm/year, with an average of 12.44 cm/year (table II). That is, slower than that assumed by Rêbello and Magnusson (1983) (35.5 cm/year), and than the one found by Herron (1991) (\bar{x} =17.2 cm/year). That will mean, making the same assumptions as in the above mentioned studies, that the period that *M. niger* spends in hunter's preferred size without been sexually mature extends from 6.5 to near 9 years.

This would explain the devastating impact that hunting has had for *M. niger* populations throughout it's distribution range, and the almost complete supplantation of this species by *C. crocodilus* in the more hunting-exposed localities.

It will also make us search for the reason of the little or none recuperation of *M. niger* populations in areas newly occupied by *C. crocodilus* (Asanza 1985, Ron 1995), despite more than twenty years of protection, not only in the competition of resources between these two

species, but also in the slow growth of *M. niger*, and the long time it needs for recruiting reproductive individuals.

And, of course, this warns us of the fragility of the few remaining populations of the larger Amazon predator.

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