Abstract

Growth has historically been considered indeterminate in reptiles. This common assumption has been challenged in recent years with accumulating evidence of determinate growth in lizards. These disputes being spearheaded by the analysis of the bone growth plates showing their closure and therefore indicating a final body size. In parallel to this growth's expected indeterminate nature, long lasting assumptions of the functions of the energetical budget in growth have also been challenged. This shift in perspective not only impacts our understanding of growth but also extends to the study of the related trait - sexual size dimorphism (SSD) - the difference in structural size between the sexes in a species. There have been three leading theories on the proximate causes of SSD: the cost of reproduction, the control by male androgens and the control by ovarian hormones. This thesis presents further evidence of the determinate nature of growth in lizards and discusses its consequences for SSD evolution. The review on growth focusing on male-larger gecko *Paroedura picta* highlights the canalized nature of growth while giving a foundation in the past literature surrounding the proximate causes of SSD. In this thesis, I present evidence of the likely role of ovarian hormones alongside the role of insulin-like growth factor 1 (IGF1) in the development of SSD through experiments with species in the genus *Paroedura*. To this end, we targeted male-larger species *P. picta* and female-larger species *P. vazimba* by studying their sex hormone levels as well as the hepatic gene expression of *IGF1* throughout growth. We discovered a spike of hepatic *IGF1* gene expression independent of sexual maturity in *P. picta* that coincides with elevated plasma levels of estrogen in the females. Distinctly, in *P. vazimba* no such spike was found but, in this species, sexual maturity and termination of growth coincided with elevated levels of progesterone in females. Importantly, the respective growth curves of each of these species are also significantly different. *P. picta* show a more classical growth pattern, i.e. similar growth patterns in early growth in both sexes before a more pronounced growth in males. In contrast we found a more complex pattern in the female-larger species with early dimorphism in growth curves for *P. vazimba* with females growing faster early on and closing their growth plates prior to males. Overall, this thesis aims to clarify the nature of growth in being determinate and canalized in lizards and elucidate the proximate causes of SSD.