Evolution of ontogenetic allometry shaping giant species: a case study from the damselfish genus *Dascyllus* (Pomacentridae)

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The evolution of body size (i.e. phenomena of giantism and dwarfism) has long been studied by evolutionary biologists. However, detailed investigations devoted to the study of the evolution of ontogenetic patterns shaping giant species are scarce. The damselfishes of the genus *Dascyllus* appear as an excellent model for such a study. Their well understood phylogeny reveals that large-bodied species have evolved in two different clades. Geometric morphometric methods were used to compare the ontogenetic trajectories of the neurocranium and the mandible in both small-bodied (*Dascyllus aruanus* and *Dascyllus carneus*; maximum size: 50–65 mm standard length) and giant (*Dascyllus trimaculatus* and *Dascyllus flavicaudus*; maximum size: 90–110 mm standard length) *Dascyllus* species. At their respective maximum body size, the neurocranium of the giant species is significantly shorter and have a higher supraoccipital crest relative to the small-bodied species, whereas mandible shape variation is more limited and is not related to the «giant» trait. The hypothesis of ontogenetic scaling whereby the giant species evolved by extending the allometric trajectory of the small-bodied ones (i.e. hypermorphosis) is rejected. Instead, the allometric trajectories vary among species by lateral transpositions. The rate of shape changes and the type of lateral transposition also differ according to the skeletal unit among *Dascyllus* species. Differences seen between the two giant species in the present study demonstrate that giant species may appear by varied alterations of the ancestor allometric pattern.