

# Ontogenetic change in the diet of *Aplodactylus punctatus*(Pisces: Aplodactylidae): an ecophysiological explanation

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## Abstract

*Aplodactylus punctatus* is a temperate herbivorous fish that changes from an omnivorous to a herbivorous diet and increases its ability to assimilate algae as it grows. To investigate whether this dietary shift is related to size-specific differences in energetic demands imposed by metabolism and the amount of assimilated energy, oxygen consumption ( $\dot{V}O_2$ ) was determined experimentally in 12 specimens ranging in size from 62 to 545 g.  $\dot{V}O_2$  increased allometrically with body size from 8.41 to 55.95 mg O<sub>2</sub> individual<sup>-1</sup> h<sup>-1</sup>. Individual energetic requirements were 2.8 to 33.7 kJ d<sup>-1</sup>. The assimilated energy was estimated, taking into consideration: (1) the energetic value of the most important alga in the diet (*Lessonia trabeculata*); (2) size-specific differences in assimilation rates for fish fed on this alga; (3) size-specific differences in throughput time and in the amount of food in a full gut. Comparison of the energy required and the assimilated energy revealed that fishes of < 22 to 29 cm total length had a negative energetic balance when consuming algae exclusively. This may explain the reliance of small *A. punctatus* on more easily-digested invertebrates. The largest individuals can meet their energetic demands by consuming algae alone, apparently because of their higher assimilation capability. In *A. punctatus*, changing energetic requirements and capacities for algal assimilation may be responsible for the observed ontogenetic change in diet.