Bioenergetics and intestinal phenotypic flexibility in the microbiotherid marsupial (Dromiciops gliroides) from the temperate forest in South America

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The microbiotherid marsupial Dromiciops gliroides inhabits the temperate forests of the Southern hemisphere, facing seasonal nutritional and energetic bottlenecks due to its apparently facultative insectivory/frugivory. In order to understand the physiological processes behind this ecological pattern, we studied the morpho-physiological changes that D. gliroides exhibits after dietary acclimation, in a sample of 21 wild-caught individuals fed over 1month with ad libitum diet of: (1) fruit, (2) insects or (3) a mix of insects and fruit. In addition, we measured oxygen consumption (VO 2) at resting conditions. We also performed enzyme assays (sucrase, maltase, trehalase and aminopeptidase N) and measurements of organ morphology. We found that D. gliroides cannot fulfil its nutrient requirements only from insects or fruit. It needs a mixed diet in order to maintain its body mass and energy balance. However, as a response of diet acclimation, individuals showed several-fold changes in the