Metabolic Depression and Seasonal Patterns of Activity in Brazilian Amphibians and Reptiles

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The annual cycle of activity in several species of South American amphibians and reptiles includes a period of inactivity, usually related to cold or dry conditions. Among reptiles, the tegu lizard *Tupinambis merianae* has been studied in the context of physiological and biochemical adjustments associated to the season pattern of activity, which includes 3-4 months of dormancy during winter. I and my colleagues have observed in dormant tegus an 80% depression of the aerobic metabolism when lipids metabolism plays an important role in supporting cellular homeostasis. Moreover, adjustments in biochemical pathways lead to changes in carbohydrates and ketone bodies metabolism in specific tissues in order to spare the fuel reserves. Similar patterns of metabolic reorganization have been observed in the frog *Pleurodema diplolistris* form the Brazilian Caatinga, a semi-arid bioma characterized by the low and unpredictable rainy regime and high temperatures. In this case, the physiological strategies during dry season involve underground activity, preservation of muscle function and moderate aerobic metabolic depression favored by a normoxic soil substrate. In these frogs, seasonal changes in the amount of lipids and carbohydrates, and in the activity of selected metabolic enzymes, evince the importance of such reserves for the energetic homeostasis. The research conducted with these groups of ectotherms hopes to understand common and specific underlying mechanisms across different lineages that exhibit seasonal metabolic arrest.

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