Different Diets Promote Specific Changes in Mitochondrial Function in the Flight Muscle of *Rhodnius Prolixus*

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Hematophagous insects use blood as the main source of nutrients. However, blood poses a challenge to these organisms since blood digestion release large amounts of heme, a pro-oxidant molecule. A hypothesis raised by our group suggested that after blood meal, hematophagous organisms reduce mitochondrial function as a way to avoid synergistic interaction of between reactive species, generated by aerobic metabolism, and pro-oxidant-derived blood products. In this regard, our group showed that blood meal promoted reversible functional reduction of *Aedes aegypti* flight muscle mitochondria. In the present work, we assessed the mitochondrial function in flight muscle of the kissing-bug *Rhodnius prolixus* in three different nutritional conditions: starved (S), blood-fed (BF) and plasma-fed (PF). Blood-feeding caused a specific reduction in both ADP-induced and uncoupled respiration. There were no changes in activities of complex III between all groups, but complex IV activity was significantly increased in PF compared to S insects. Compared to S group, hydrogen peroxide production decreased in all metabolic states upon feeding, regardless the diet. Also, the supra-molecular organization of mitochondrial complexes was reduced in S animals. We conclude that mechanisms related to substrate uptake/oxidation and rearrengments of supra-molecular mitochondrial complexes, take place after feeding, which could be a key adaptive response of this insect to hematophagy.
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