Project Update: February 2022

Despite the delayed onset of the full-day tracking of GHLTs due the COVID-19 pandemic, and the problems with the permanence of dye marks on GHLT tails, which were later solved by employing a new harmless dye, we concluded 11 months of data and sample collection in the field. Outside the study area, we encountered some difficulties to find a new freeze dryer for the preservation of the faecal samples. To tackle this difficulty, we adapted our preservation protocol with the available equipment, so that instead of a freeze dryer we ended up using an oven. On another note, as the amount of data started to pile up more and more, we decided to include a data entry assistant in our team with whom I share the task of transcribing the voice recordings and field sheets. We meet regularly to check the quality of the resulting spreadsheets.

All the objectives that involved fieldwork have been met; however, we are still in the process of concluding the objectives that involve lab work. Once we finish data transcription and the measurement of hormones, we will be able to provide a well-founded understanding of the energetic condition of GHLTs linked to the food availability in degraded forests, their activity patterns, and the levels of faecal glucocorticoids (GC) and triiodothyronine (T3). For now, I would like to briefly describe what has been achieved in each objective and what are the next steps to take:

- Establishment of phenology plots: we established 47 plots within four lion tamarin group home ranges. These plots were distributed across crops and forest fragments in different regeneration stages. Inside them, we measured the diameter at breast height and identified a total of 803 plants.

- Behavioural observation of wild GHLTs: we conducted 11 months of focal observations of three groups of lion tamarins. We documented the behaviour of 14 adult lion tamarins focusing on energy intake and expenditure, and social interaction. We recorded 1026 10-min focal samples that together added up to 171 hours of observation.

- Collection and processing of GHLTs faeces: we collected a total of 289 faecal samples (257 samples concurrent with behavioural observations and 32 samples during two captures performed by Project BioBrasil's team). To preserve the samples outside the study area, first we evaporated the alcohol (80%) and dried them in the oven for 4 hours at 50 °C. Then we packed all samples in sealed mylar bags and stored them at -20 °C.

- Food availability assessment: we monitored the fruiting and flowering stage of 129 marked trees for 11 months. Marked trees belonged to 20 plant species of lion tamarins' preferred diet.

- Validation of lab tests and hormone concentration measurements: analytical validation of glucocorticoids (GCs) and triiodothyronine (T3) enzyme immunoassays kits and validation of preservation procedures have been performed with an additional set of faecal samples collected by Interlab-UMU. Selected enzyme-immunoassay kits showed good sensitivity and precision for the use with our samples. Shipping of faecal samples to laboratory in order to conduct hormonal measurements is still in process.

- Statistical analysis, reporting and concluding remarks for conservation: transcription of marked tree phenology was completed. Focal observations, on the other hand, are currently being digitised, we have transcribed 7 of the 11 months of data. Once transcription of data and hormonal analysis is completed, we will start the statistical analysis.

In addition to the level of achievement of each objective presented before, I would like to share some insights and predictions we can draw, based solely on field observations and preliminary data analysis. Please notice that this information will be verified later once all data is obtained.

- Preliminary data analysis suggests that GHLTs rely on effective feeding strategies that allow them to manage their energy balance during periods of seasonal food shortage. Some evidence of that is: GHLTs have a flexible diet (we have observed them feeding on different climbing plants, secondary species, mushrooms, and exotic plants), GHLTs are extremely skilled at foraging for animals in a wide variety of substrates (bromeliads, vines, palm trees, tree barks and holes, dead tree trunks, tangled climbing plants, dried leaves), GHLTs adapt their behaviour and foraging range according to seasonal changes (during summer groups spent more time resting and grooming whereas in winter, with declines in food availability, groups tended to remain close to abundant food sources such as patches of Melastomataceae trees or ripe jack fruits).

- Frequent inter-group encounters and high home range overlap between neighbouring groups resulted in high rates of aggression between individuals of different groups which limited food access for certain groups. In addition to that, groups were unstable throughout the sampling period with several migrations of known and unknown individuals, causing further chases and aggression episodes.

- Both findings can lead us to conclude that the social context of GHLTs in our study area may play a significant role in the effectiveness of their behavioural and physiological responses to cope with environmental challenges. Habitat fragmentation in our region is a multi-layered issue that brings about many influences, such as frequent encounter rate and high group instability, which may blur the direct effect of food availability on the energetic condition of the GHLTs. To provide further insights on effective coping strategies and energetic condition of GHLTs in our study area, we need to conduct the hormonal analysis on the faecal samples. However, we can predict that GCs will be affected by social and nutritional stressors, while T3 may help us in telling apart these stressors.


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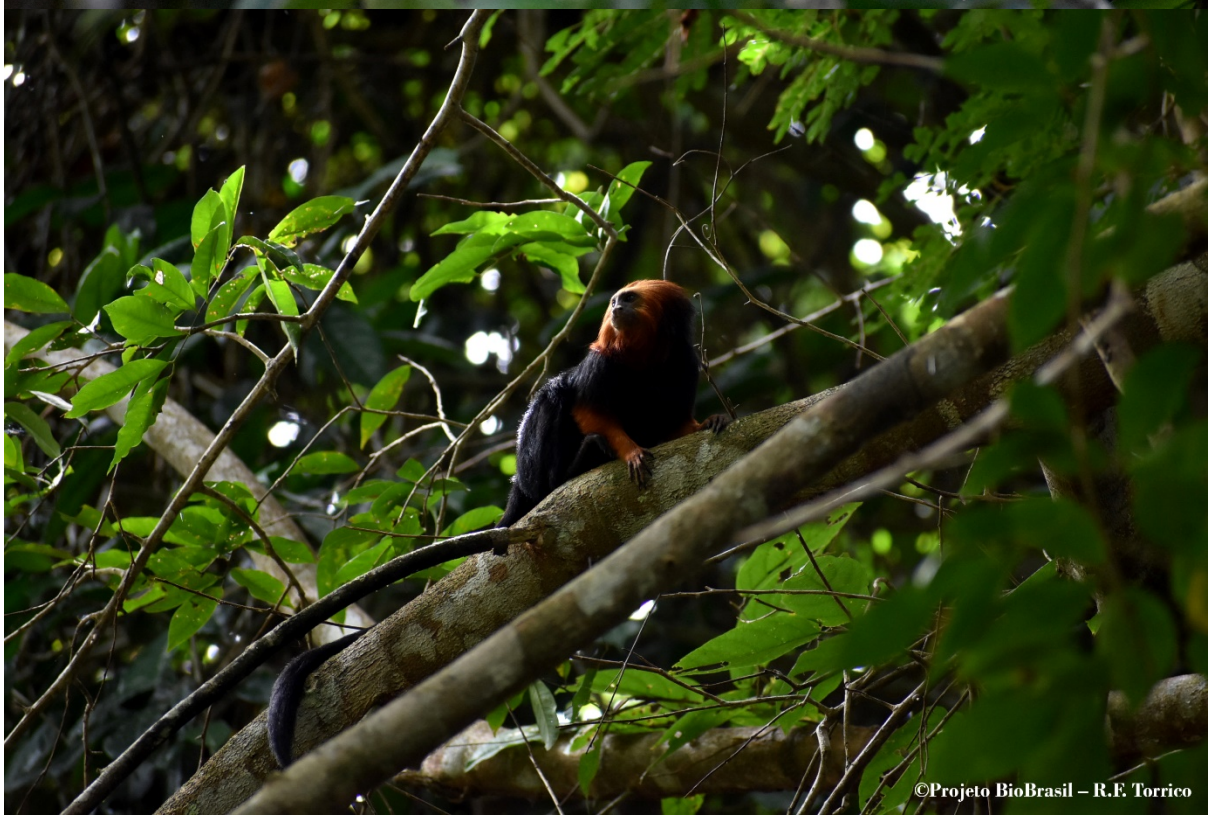
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