Project Update: April 2017

In the first update, I reported my work field activities and present some preliminary results related to biological and ecological aspects from June to August 2016. Indeed, our findings suggest that the presence of forest fragments adjacent to coffee plantations implies in higher species richness and abundance of social wasps (natural enemies) as well as higher levels of pest biological control when compared with coffee plantations located in landscapes where forest remnants are small and isolated. The biological data from September 2016 to March 2017 are being identified by taxonomists. In this second report, I focused on interactions with stakeholders that comprehend approximately 30 people from 16 farms where biological and ecological data are being collected.

Work field activities

As highlighted in the first update, work field and data collection (predatory insects, coffee pest, crop management information, landscape mapping and micro-climate variables) are being well succeeded (Figures 1A, B, C, D and E). The financial support provided by "The Rufford Foundation" are being crucial to rent 4x4 vehicles to assess remote sites especially during the rainy season (December 2016 – March 2017).

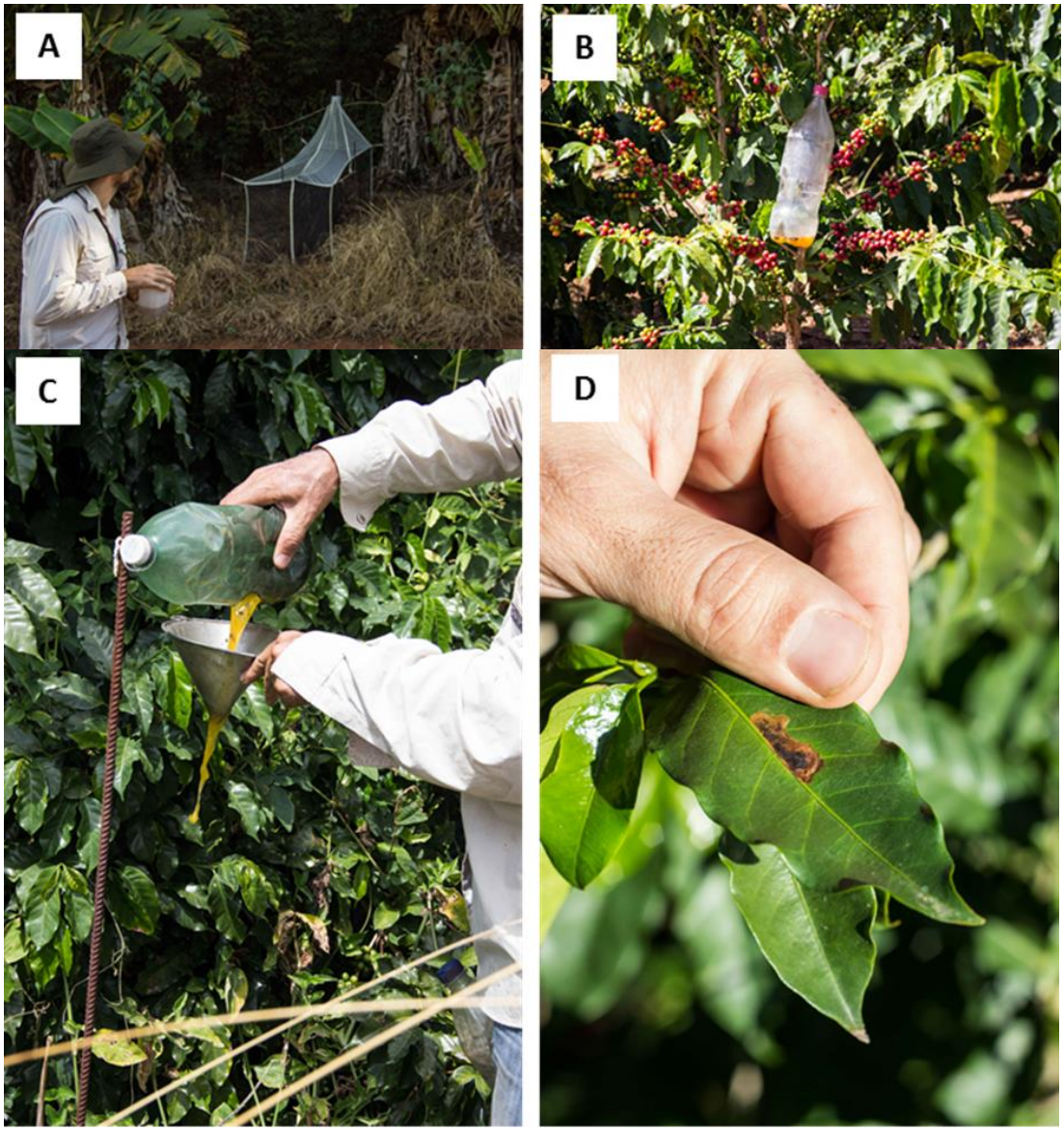

Figure 1: Routine activities to collect biological data. A) Collecting of specimens captured with Malaise traps. B) Attractive traps fixed in coffee plants. C) Collecting specimens captured with attractive traps. D) Visual assessment of pest density in coffee plantations and E) Captured insects conserved in alcohol 70% and stored in plastic pots purchased with Rufford's small grant.

Concomitantly with data collection (biological data), I interact with approximately 30 people among farm owners, farm managers and employees (Figure 2 A, B, C and D).

Figure 2: Interaction with people (land owners, farm manager and employees). A) Hugo RM talking with Seu Antonio (farm employee). B) HRM showing predatory wasps for Maique Neves (farm manager) and employees. C) HRM talking with Seu Luiz and Marinalva (couple of farm owners). D) HRM interacting with Seu Esmerindo and Seu Sebastião (farm employees). E) HRM talking with Seu André Bertolazzi (farm manager) and F) HRM and Seu Dorival (farm employee). The field assistant and the rented 4x4 vehicle financed with Rufford's grant are in the right side of Figure 1D.

Most people are being very collaborative and interested in our project. During conversation with farmers, concepts and technics used to promote biodiversity conservation and ecosystem services in farmland are being introduced and discussed. Additionally, I am showing the species collected in traps to introduce beneficial insects (natural enemies and pollinators) to farmers (Figure 2B). After months of interaction with farmers, I was able to introduce important concepts and practical initiatives to promote biodiversity and ecosystem services in their own properties.

To evaluate if the activities of this project effectively sensitized farmers about the importance of conserving forests and biodiversity is a hard task and virtually impossible to be quantified, however I realised that some farmers adopted many actions that I have suggested. For instance, in seven farms pest populations are now periodically monitored and coffee plantations are submitted to pesticide application only when pest population reach the threshold of economic damage that are suggested in scientific literature. In these seven farms, the pesticide applications used to follow a calendar of pesticide applications regardless the presence or absence of pest in crops. Such strategy implies in many unnecessary pesticide usage with environmental and socio-economic losses.

Three of the seven farms adopted my suggestion that pesticide applications should be made in the end of the day to avoid high mortality of non-target species especially natural enemy and pollinator insects. Indeed, a study conducted in Brazil found that most natural enemy insects present high activity in crops from 10 am to 4 pm (Unpublished data). Therefore, to conduct pesticide application after 4 pm could avoid high mortality rates of these beneficial insects. Moreover, two farms are now using selective pesticides that present low toxicity for non-target species such as birds, predatory insects and bees. On the other hand, people from six farms seem not changed their management actions that are based on an annual calendar of applications. Additionally, five of these six farms present low species diversity, low forest cover and high pesticide usage.

First Outcomes and Next Steps

My next steps are to conclude data collection in June 2017, focus on data analyses and divulgation of the project as highlighted below:

1 - Publish the results of this work in the most relevant scientific conferences and journals of Conservation Biology and Ecology in order to reach conservationists around the world.

About this topic I have a solid network with researchers from universities, research institutes and museums in Brazil, Germany, Finland, Denmark and Mexico who will directly contribute in species identification, data analyses and writhing of manuscripts. This network will significantly increase the quality of the manuscripts and the chances of acceptance in the best journals of ecology and conservation such as Biological Conservation, Journal for Nature Conservation, Oryx, Journal of Applied Ecology and Ecography. I expect to have first publications in the second semester of 2018 because the peer-review process usually takes several months.

Another focus of divulgation is my participation in international conferences of conservation and ecology. So far, an abstract with the preliminary results of this project has been accepted for poster presentation in the 1st International Conference on Community Ecology (see: https://confcomec.akcongress.com/). The conference will be held in Budapest, Hungary in 28-29 September 2017. My Graduate Program awarded me with a fellowship that will support my participation in this conference. The letters of acceptance is attached in appendix. I expect to divulgate the biodiversity conservation outcomes of this project in other international events and for this reason; I will keep seeking financial support to participate in other conferences around the world.

2 - Educational contributions through lectures for farmers and students of the study region.

The first lecture was held in 11 May 2017 (Figure 3) for students and professors at São Paulo State University (UNESP).

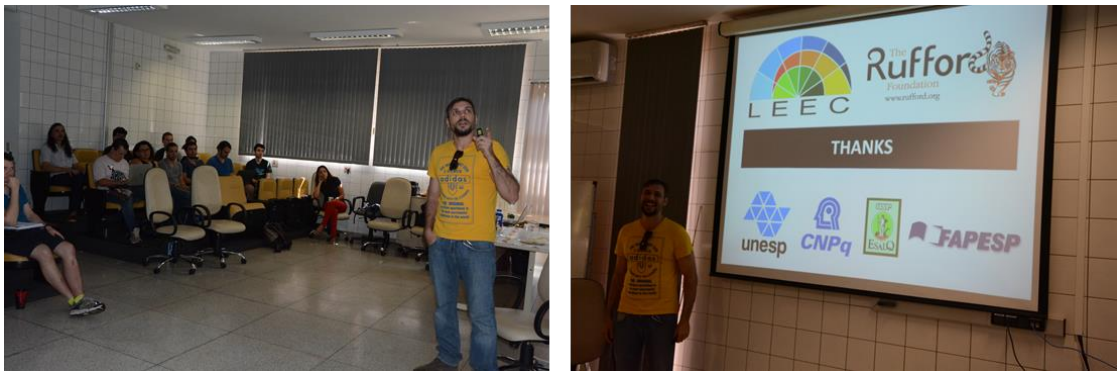

Figure 3: Lecture conducted by Hugo R. Medeiros for students and professors of UNESP and visitors from Dalhousie University (Canada) and Aarhus University (Denmark). The lecture was held in the campus of UNESP in Rio Claro city, São Paulo State, Brazil.

I expect to present the results of this project in farmer's cooperatives of the study region. For this purpose, I made partnership with the institute "Instituto Biossistêmico" that develops many initiatives for sustainable agriculture in the study region (see: www.biosistemico.org.br) including lectures in farmer's cooperatives.

This institute will provide the divulgation and organization of my lectures for farmers in cooperatives. Furthermore, I have contact with some professors of the largest private university in the region “UNIFEOB” (see: http://unifeob.edu.br) where I intend to divulgate the results of this project for the students. The lectures for stakeholders and students will be concentrated in July 2017 after finish data collection.