

Project Update: September 2012

In August 2012, I arrived in Santa Teresa, Espírito Santo, Brazil and selected 18 study sites and tested sampling methods. These 18 sites represent 3 matrix types (Fig. 1), or six replicates of each matrix type. The overall goal for this field season (August-December 2012) is to collect data from 12 replicate sites of each matrix type, so I will continue to identify additional sites throughout the study season. Each site includes data collection within both the forest reserve and the matrix. Two plots of 5 x 5 m have been set up at different distances from the forest edge; 1) 50 m within the matrix, 2) at the forest edge, 3) 50 m within the forest and 4) 200 m within the forest.



Fig. 1– Three studied matrix types that surround the *Reserva Biológica Augusto Ruschi*. A) *Eucalyptus spp.* plantation, B) coffee plantation, and C) secondary forest.

There have been several methods for collecting bromeliad and leaf litter frogs in the literature including active searching inside bromeliads, walk in transect, acoustic survey, survey in plots of specific area. After experimenting with several approaches, I have found that searching inside bromeliads and the leaf-litter in 5 m x 5 m plots with four people each searching 1.25 m x 5 m areas for 20 minutes was the best method to collect the most leaf litter and bromeliad-dwelling frogs in a logistically-feasible manner.



Fig. 2- A) team of fieldwork, B) active searching of the leaf litter within 5 x 5 m plots, C) active searching inside bromeliads.

During the first three weeks of fieldwork, three replicates of each matrix habitat type (Eucalyptus plantation, coffee plantation and secondary forest) that surround the *Reserva Biológica Augusto Ruschi* were surveyed. For some of these areas, this was the first time that an anuran survey had been conducted there. In these areas 98 bromeliads were sampled including some vulnerable to extinction (Fig. 3). Bromeliads were found to occur mostly after the first 50 m from forest edge.



Fig. 3 – Soil and epiphytes bromeliads that are used as reproductive microhabitat by some frogs.

Thus far, 20 species of frogs have been recorded in the sites; three were found inside bromeliads and 17 in the leaf-litter. All bromeligenous frogs were collected in primary-forest areas surrounded by secondary forest, meaning that none of these frogs were collected within secondary forest, coffee plantations or Eucalyptus. Valuable new data on the distribution, population density, natural history, and biology have been gathered for both bromeligenous and leaf-litter frogs. These data will improve conservation assessments of endangered, endemic and data deficient species listed in the IUCN red list. For example, the near threatened bromeligenous frog, *Crossodactylodes izecksohni* Peixoto, 1983 was collected only inside bromeliads. This species is endemic to Santa Teresa, Brazil, the municipality that is the focus of this project. I observed the defensive mechanisms of *C. izecksohni*. I am writing a short-note reporting this observation that will be submit to Herpetology Notes. Although it is still under investigation, I have potentially found an undescribed species of bromeligenous frog (Fig. 4 B), also belonging to the genus *Crossodactylodes*.



Fig. 4- A) The Santa Teresa's endemic bromeligenous frog *Crossodactylodes izecksohny* is rarely seen but in August 2012 it was observed calling from bromeliads in the *Reserva Biológica Augusto Ruschi*. B) *Crossodactylodes* sp. C) Common bromeligenous frog, *Flectonotus fissilis* Miranda-Ribeiro, 1920.

Part of the educational element has started through interviews with local villagers (Fig. 4). Thus far, 12 local families were interviewed. Preliminary analyses indicate that 80% of the interviewed people do not know that some frogs use bromeliads as reproductive microhabitat; 65% have bromeliads in their yard; and 70% of these bromeliads were collected from the surrounding forest.

A photographic collection has been made and it will be used to compose a booklet to be distributed to the local villagers that live around the reserve.

Talks and educational conservation discussion with local high-school students are planned to start in the second week of November 2012. Arrangements have already been made with two elementary schools. In the first phase of this educational element, 340 students will have the opportunity to learn about the ecological relationship between bromeliads and frogs. By adopting practical methods, in addition to theoretical information, I plan on encouraging discussions regarding this fascinating relationship between these plants and animals that make use of them.



Fig. 4- Rodrigo Ferreira talking and interviewing the local villagers around the *Reserva Biológica Augusto Ruschi*.

I would like to address the timing of the current project. Because financial support was not available in August 2011, fieldwork was postponed until August 2012, the next rainy season. September through December is the breeding season for most of the bromeliad-dwelling frogs in the Atlantic rainforest, and therefore the best time to conduct this research.

By December 2012, I intend to collect data from a total of 36 sites, with 12 replicates per matrix type. I also intend to return to these sites in May 2013 and collect duplicate dry season data to compare with the 2012 rainy season.