Project Update: December 2009

We now have evidence that arboreal epidemics of amphibian chytrid fungus are certainly possible, and that this pathogen may affect ALL amphibians, despite life history pathways. We have now discovered infection in species with aquatic arboreal larvae (bromeliad frogs-*Bromeliohyla bromeliacea*) as well as direct-developing terrestrial larvae (salamanders of the genus *Bolitoglossa*). These groups of amphibians do not enter permanent water bodies, can be found any distance away from rivers, and obtain their moisture from the rainwater captured by bromeliads and other epiphytes. Interestingly, we did find the water within some bromeliads to be surprisingly acidic (as low as pH 3.3), but we also observed great variation between the water condition of bromeliads within any given location. Therefore, although some bromeliads within forest canopies might provide safe havens from amphibian chytrid fungus, others certainly do not. As such, we fear that the situation is more grave than expected: arboreal and semi-arboreal amphibian species are not protected by the condition of arboreal water bodies, *nor do they experience decreased exposure by avoiding infected terrestrial water sources*.

As interesting as all of our data are, the last statement is of greatest significance and I would very much like to pursue this further. I have already designed a substantial project to conduct during the summer of 2010 to continue this work. This past summer, we found chytrid-infected tadpoles within arboreal bromeliads and this literally blew my mind. The infections were severe and were exhibited by tadpoles completely confined to bromeliads, and these bromeliads were located some distances away from any terrestrial water source....meaning that something must have *brought* chytrid to the tadpole. Whereas adult amphibians can cause their exposure by virtue of their own locomotion, these tadpoles could not. Most people would think little of this and assume that an infected amphibian must have wandered from bromeliad to bromeliad, shedding infectious chytrid zoospores along the way, which subsequently infected my tadpoles. But in none of these immediate locations can you find ANY species of amphibians which enter terrestrial water sources, where chytrid is most likely to be acquired. Therefore, I believe that this pathogen is also spreading by wind and/or precipitation events (i.e. tropical storms), and hope to be the first to provide evidence of this dispersal mechanism; which carries with it global conservation implications.