



A Visit to Two Unique Mantella Populations in East-central Madagascar

by Devin Edmonds

View from on top of a deforested hill on the way to find Mantella.

The dirt road turned into an ankle deep river of mud in a matter of minutes once it started to rain, and the brown, sandy earth that coated my pants from walking through rice paddies the past few hours was quickly replaced by the red of the logging road we now slogged through. Under my borrowed rain coat was the prize for this uncomfortably wet and physically exhausting journey – a 1GB digital camera card with photographs of a frog

I could never have imagined, had I not seen it myself.

I was in Madagascar and on a mission, searching for seven species of the endemic amphibian genus *Mantella*. They are perhaps the most well-known frogs on the island, many of which display attractive aposematic coloration, similar to that of the familiar Central and South American *Dendrobatids*. Having passionately kept *Mantella* species in captivity for over a decade, I had dreamed of seeing those in the wild for many years, and now, with

knowledge from journal articles and direction from Malagasy guides, it was becoming a reality.

Mantella milotympanum, one of the smallest mantellas, was on my list of species to see. It's only known from its type locality in east-central Madagascar, in forests around the town of Fierenana. During my research prior to the trip, I came across several articles which referred to populations of *M. milotympanum*-like frogs to both the south and north of their type locality. Some of these were described



Top Left: Wood chippings from recent logging activity at variable *M. cf. milotympanum* locality. Many frogs were found around this pile of wood chips.



Bottom Left: *M. cf. milotympanum* from the variable population, appearing much like typical *M. milotympanum*

Bottom Right: *M. cf. milotympanum* from the variable population, red in color like *M. milotympanum* but with a pattern like *M. crocea*

as looking identical to the typical red *M. milotympanum*, but instead being green in color. Additionally, at least one population was said to be variable, being intermediate in pattern between *M. crocea* and *M. milotympanum*. These were the populations I planned to visit, though with only GPS coordinates of where they occurred and no direction of how to get there, I was not confident I would find them.

Traveling by taxi-brousse (bus-like vans or pickup trucks, outfitted with extra seats to accommodate twice as many people as they can safely fit), I headed north of the city Moramanga, joined by a guide named Dupsie I had met previously while searching for *Mantella* elsewhere. We were unsure exactly where we were going, but had a map marked with known *Mantella* localities. We passed it around to other taxi-brousse passengers, asking them if they knew any of the locations on it. As it turned out, we were in luck, with

a woman having grown up in a village near one of the variable *Mantella cf. milotympanum* populations. We got off the taxi-brousse with her in a small, dusty town on the side of the road, found a local farmer who agreed to lead us to red frogs that sounded like mantellas, and then slept that night at his friend's house.

We started hiking early the next morning. As we walked, the surrounding landscape changed from treeless hills (victims of slash and burn agriculture), to patches of forest, interrupted only by frequent rice paddies and a red-dirt logging road. We followed this road for a couple hours until it ended at a pile of lumber and a footpath, which we then followed into the forest.

Descending down the side of a hill, a familiar sound could faintly be heard in the distance. The untrained would not have noticed it as they walked past, and if they had, they likely would

have disregarded the sound as field crickets, not realizing it to be a unique population of critically endangered frogs. It was what Dupsie and I had been waiting to hear. We walked further down the hill and then into the forest towards the sound. The farmer found the first one, a bright orange frog looking like *M. milotympanum* but with a black mask around the face, similar to *M. crocea* – exactly what we were looking for! Others in the population were patterned like typical *M. milotympanum*, red with solid black dots on the tympanums, while most frogs were somewhere between the two extremes and had varying amounts of black on their flanks and face.

When we visited, the forest was under pressure from selective logging, with many frogs being found close to a pile of wood chips from recent logging activity. Running through the forest was a small stream, near which



Top: *M. cf. milotympanum* from the variable population, very similar to *M. crocea* but more orange in color and with a slightly thicker frenal stripe.

Bottom: *M. crocea* (captive) for comparison.

male frogs called from the cover of underbrush and the tops of fallen logs. Exploring the area further revealed that the forest on one side of the stream had been cleared, and what remained was a bed of ferns and small shrubs. Within these ferns, occasional frogs could be heard calling, but not like the high densities found on the other side of the stream where there was forest.

We returned to the roadside town in the late afternoon, and started to make plans for the next day. I was hopeful that we would be able to locate the green *Mantella cf. milotympanum* I had read about and seen in the pet trade, and asked the farmer about the possibility of finding those. He wasn't aware of any green frogs in the area that were small enough to be a *Mantella* species, but said he would ask around town and try to find someone who knew of them. The farmer returned that evening with an old, bald man; his father. According to him, 30 km to the east was a village where he had seen frogs that sounded like what we were looking for. Interestingly enough, he said that the stream

near the population of variable *M. cf. milotympanum* we had visited earlier continued on to the east, and it was around this same stream where the green mantellas could be found.

The next morning Dupsie, the farmer, and I again left at dawn. We ignorantly thought we could hike the 60 km to the village and back in one day. Continuing along the same path we had followed previously, we again walked up and down treeless hills until reaching the forest and red-dirt logging road. Along the way we met a group of teenagers walking back to the roadside town. Dupsie translated to me that one of them said he was from the village we were hiking to and, even better, knew exactly where green mantellas were. We continued on at a fast pace, with the teenager leading the way.

As the sun rose, it became very hot, and the occasional mud puddles in the road dried. We cut back and forth between the road, forest footpaths, and rice paddies, the entire time half-running/half-walking, in hopes we would get back before dark. Around 1:00 P.M. we descended the side a forested hill, toward a grassy valley below. As we walked through a transitional zone of ferns and bushes between the hillside and valley, both Dupsie and I stopped, listened, turned to each other, and with a big smile on our faces said "Mantella!"

Completely unexpected, we had stumbled upon a population of mantella frogs, only halfway to our destination. The chorus was unmistakable, and certainly a *Mantella* species, but the thick fern bed from which they were calling was so dense it prevented us from seeing any. All four of us got on our hands and knees and started carefully looking for the source of the cricket-like chirps that surrounded us. I spotted the first one: a beautiful lemon yellow *M. milotympanum*-

patterned frog, calling from the top of a concealed fallen log within the ferns. Other frogs located turned out to be yellowish-green in color. While excitedly photographing this unique population, the farmer came to me holding something between his fingers. Dupsie followed saying "It's different, very different!" I was blown away as the farmer revealed what he was holding. Between his fingers was a mantella like no other I had seen before. Its appearance was similar to the other



Top: *M. cf. milotympanum*, greenish in color.

Bottom: *M. cf. milotympanum*, yellow in color. yellowish *M. cf. milotympanum*, but with light blue marbling on the posterior half of its dorsum and hind limbs. I'm unsure if this particular blue individual represents others within the population, or was just a uniquely colored frog. Either way, it was an incredible find, and more than I could have expected.

After the initial excitement of finding and photographing frogs, I spent some time walking around the area. I ventured along the path through the ferns and into the grassy valley, and as I did so the frog calls became distant. Walking along the border of the ferns and knee-high grass, I found



Top and Bottom: *M. cf. milotympanum* with blue marbling posteriorly.

the calls to again become distant as the transitional zone disintegrated into the underbrush of a forest. It seemed that these newly found *M. cf. milotympanum* were confined to a tiny patch of ferns surrounding the footpath, elsewhere being absent (or

at least silent) on the day I visited. We left the area in the late afternoon, and as we hiked up the forested hill back to the roadside town, the teenager who had been guiding us noted that the valley would be turned into a rice paddy next year. His prediction was enforced as I looked around and noticed that the other valleys I could see were green with rice, with the valley we had just explored being the only one in eyesight without agricultural development.

Hiking back, it started to rain. At first I was thankful for the water because it cooled my sunburned skin and helped quench my thirst (we drank all of our water on the way there). But as the rain continued to pour down from above, our path turned into mud and I trudged along at a slow pace, trying hard not to fall and embarrass myself in front of my Malagasy companions. We returned to the roadside town nearing sunset, soaking wet and covered in mud, with little hope of drying our clothes as the rain continued on through the night. I was content though, and slept well that night, comforted by a camera full of photographs of an unforgettable mantella frog.



A transitional zone between a forested hill and grassy field. From within the ferns, male *Mantella cf. milotympanum* call loudly.

It's been proposed that *M. crocea* and *M. milotympanum* may in fact be one species, and the intermediately patterned population I first visited visually suggests this. Individuals within it vary in color from red to orange, some only with two black spots on their tympanums (typical of *M. milotympanum*) and others with a black face mask (typical of *M. crocea*). I'm hopeful that future genetic work will be carried out on both species, as well as intermediate populations, to help sort this out.

Unfortunately, time is running out for work to be done on these frogs, with slash and burn agriculture and timber extraction eating away at their small, remaining habitat. The effect humans are having on the frogs was most noticeable at the first population I visited. While there were many frogs in the selectively logged area, the deforested field of ferns across the other side of the stream seemed to have few frogs, with only occasional calls heard. Data should be collected to obtain population estimates and confirm this observation. Also somewhat alarming was the statement the teenager made about the future of the valley where we found the yellow *M. cf. milotympanum*, and how it will likely be a rice paddy next year. Systems should be put in place now to protect these unique amphibians, which may be an important piece of the taxonomic puzzle called Mantella.

I plan to return to the area northeast of Moramanga sometime in the next year to again search for mantella frogs. It's incredible to realize that in only a couple days of exploring the area, we were able to locate a previously unknown *Mantella* population. With this potential, there is no telling what we could do with more time there and what exceptional frogs could be found.