

NMR analysis of frog skin secretions from Madagascar

Valerie C. Clark (Queens University in Belfast, School of Pharmacy), Aaron T. Dossey (UF, Biochemistry), James R. Rocca (UF, McKnight Brain Institute), Chris Shaw (QUB, Pharmacy)

Old World *Mantella* and Neotropical *Dendrobates* poison frogs are known to obtain alkaloids from their diet (Clark et al. 2005), but no other skin chemistry has been documented from these frog groups. Over the past 50 years unfractionated skin secretions from poison frogs have not been analyzed by NMR. In 2006-2007 at Cornell University, VCC obtained preliminary results that revealed chemical compounds not yet documented in skin of Madagascar poison frogs (*Mantella*; Fig. 1). Using a 5mm 600 MHz Bruker cryoprobe and NMR spectrometer at

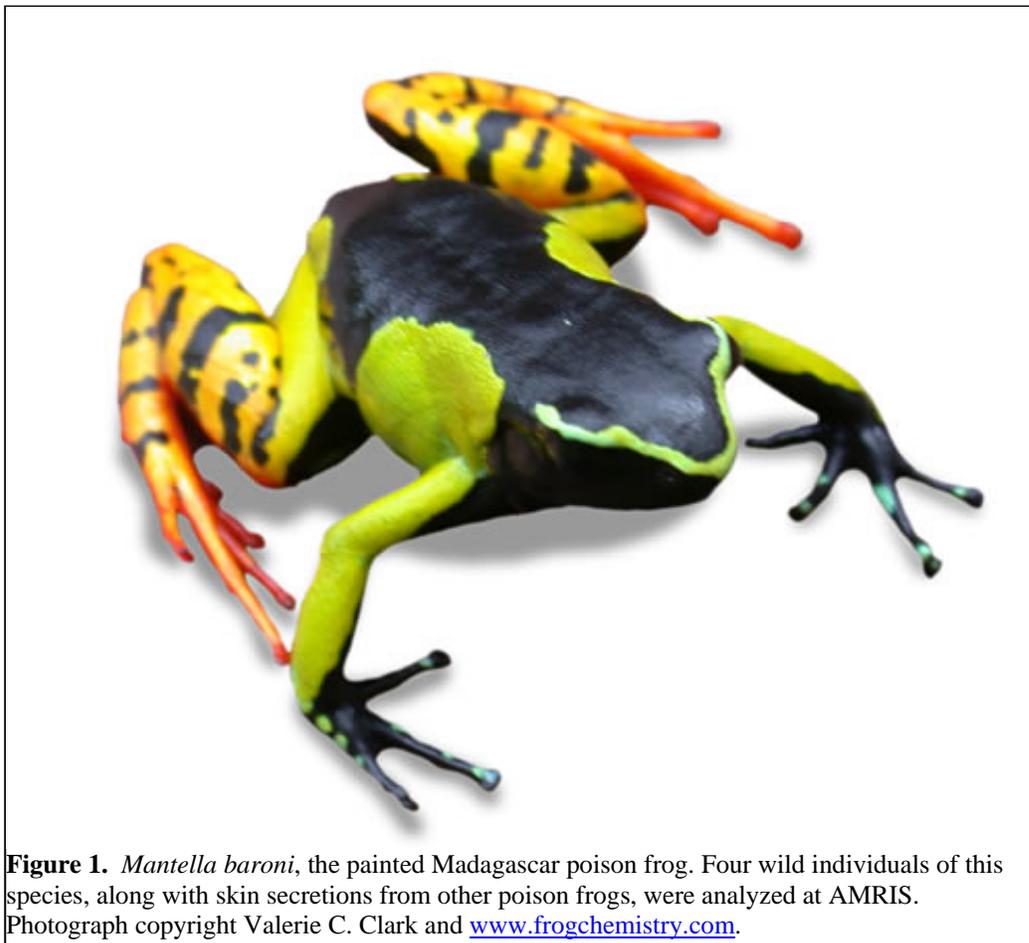


Figure 1. *Mantella baroni*, the painted Madagascar poison frog. Four wild individuals of this species, along with skin secretions from other poison frogs, were analyzed at AMRIS. Photograph copyright Valerie C. Clark and www.frogchemistry.com.

AMRIS, additional 2D NMR experiments (TOCSY, COSY, HSQC, HMBC, NOESY) were performed on skin secretions collected from individual poison frogs—the sensitivity of this instrument has proven sufficient for single frog analysis. These studies demonstrate the effectiveness of modern NMR technology for the analysis of limited amounts of natural samples. Mass spectral data is being acquired at QUB to confirm the unpublished skin chemical structures.

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References

Clark, V. C., C. J. Raxworthy, V. Rakotomalala, P. Sierwald, and B. L. Fisher. 2005. Convergent evolution of chemical defense in poison frogs and arthropod prey between Madagascar and the Neotropics. *Proceedings of the National Academy of Sciences USA*. 102:11617-11622.