



|                                      |   |
|--------------------------------------|---|
| <b>WORKING PROJECT TITLE</b>         | What do toads eat & what eats toads?  |
| <b>CORE TEAM MEMBER</b>              | John Measey   |
| <b>ACADEMIC LEVEL OF THE PROJECT</b> | Honours   |
| <b>PROJECT BACKGROUND</b>            | <p>The evolution of frogs (Amphibia: Anura) has resulted in a massive diversity of species covering many ecological niches and geographical areas, resulting in generalists and specialists. The toads (Anura: Bufonidae) have been particularly successful radiating across the world in 10 million years (Pramuk et al 2008), and it has been proposed that they have evolved key traits of a range expansion phenotype (van Bocxlaer et al 2010). One of these traits (the parotid gland) makes toads unpalatable to many would be predators, and it has been proposed that frogs do not eat toads. It has also been proposed that toads are specialist mymercophages (Caldwell 1996; Isacch &amp; Barg 2002), and that this speciality existed prior to the divergence of dendrobatids (poison arrow frogs) many of which are facultative mymercophagists (Caldwell 1996).</p> <p>This project uses the published literature to determine what animals eat toads, and what toads eat. The MeaseyLab has already identified 323 papers from 228 species of frogs (Measey et al 2015), but the student would be required to search the literature further for toad predators. The aim would be to respond to the two proposed hypotheses (a) that frogs don't eat toads, and (b) that toads are specialists.</p> <p>This desktop study requires a student who can interrogate many literature databases, as well as corresponding with authors and librarians to obtain old literature. Data analyses will be quite involved and require someone willing to learn new statistical methods (in R). The project is expected to be written up in the form of a</p> |



published paper.

**FURTHER READING**

Caldwell, J. P. (1996). The evolution of myrmecophagy and its correlates in poison frogs (Family Dendrobatidae). *Journal of Zoology*, 240(1), 75-101.

Isacch, J. P., & Barg, M. (2002). Are bufonid toads specialized ant-feeders? A case test from the Argentinian flooding pampa. *Journal of Natural History*, 36(16), 2005-2012

Measey, G. J., Vimercati, G., de Villiers, F. A., Mokhatla, M. M., Davies, S. J., Edwards, S., & Altwegg, R. (2015). Frog eat frog: exploring variables influencing anurophagy. *PeerJ*, 3, e1204.

Pramuk, J. B., Robertson, T., Sites, J. W., & Noonan, B. P. (2008). Around the world in 10 million years: biogeography of the nearly cosmopolitan true toads (Anura: Bufonidae). *Global Ecology and Biogeography*, 17(1), 72-83.

Van Bocxlaer, I., Loader, S. P., Roelants, K., Biju, S. D., Menegon, M., & Bossuyt, F. (2010). Gradual adaptation toward a range-expansion phenotype initiated the global radiation of toads. *Science*, 327(5966), 679-682.

**KEY CONTACTS**

John Measey c: 021 808 2385 e: [john@measey.com](mailto:john@measey.com)  
Giovanni Vimercati c: 021 808 2339 e: [gvimercati@outlook.com](mailto:gvimercati@outlook.com)

**CONTACT DETAILS OF CORE TEAM MEMBER**

John Measey c: 021 808 2385 e: [john@measey.com](mailto:john@measey.com)