

Diet and Chemical Defenses of the Sonoran Desert Toads

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Abstract: The Sonoran Desert Toad (*Incilius alvarius*) is the only animal known to secrete the psychedelic compound 5-MeO-DMT as a chemical defense, but the source of 5-MeO-DMT in *I. alvarius* remains unknown. Some amphibians endogenously produce chemical defenses while others acquire them from specialized diets. In this study we analyzed toxin gland secretions and diet profiles from wild *I. alvarius* and sympatric anurans from native and urban habitats around Tucson, Arizona to explore possible links between diet and 5-MeO-DMT production. All *I. alvarius* secreted high concentrations of 5-MeO-DMT, whereas other sympatric toads did not. The diet of *I. alvarius* was similar to that of sympatric anurans, indicating that *I. alvarius* does not exhibit relative dietary specialization. Slight dietary differences between *I. alvarius* in native and urbanized habitats were observed. Taken together, these lines of evidence suggest that diet is not directly linked to 5-MeO-DMT production, and support the alternative hypotheses that Sonoran Desert toads synthesize 5-MeO-DMT endogenously or via a microbial symbiont.

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Project Links

- <https://www.biorxiv.org/content/10.1101/2023.10.06.561297v1>

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