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## Quantifying the Role of Amphibians and Reptiles as Biological Control Agents in Dry Forest Agroecosystems of Northeastern Brazil

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### Abstract

In tropical dry forests of northeastern Brazil (Caatinga) herbivory through arthropods is, next to climatic limitations, one main driver for limited natural food resources in agroforests systems, where livestock farming is one of the most important perpetual sources of income. A paramount EES is biological pest control by vertebrate predators, in case of tropical dry forests, particularly mostly opportunistic amphibian and reptile predators. Analyses along a land-use gradient showed a negative correlation between herbivory of the two main tree species of the Itaparica reservoir (Pernambuco, Brazil), *Poincianella pyramidalis* and *Aspidosperma pyriformium* and abundance of amphibian and reptile species. To detect a functional link of the Herpetofauna as biocontrol agents, we analysed arthropod community using different methods (pit-fall traps, Malaise traps, sweeping net and beating net) in combination with diet analyses (stomach flushing of 200 individuals) of the common amphibian and reptile species of the study region. Five major insect orders (Coleoptera, Hemiptera, Isoptera, Lepidoptera and Orthoptera) account for the majority of observed herbivory. Most efficient method for sampling of potential arthropod pest species was the sweeping and beating net. Pit-fall traps showed less number of potential pest species, as the preferred habitat of most arthropod pest species seemed to be in the canopy region. Furthermore, pit-fall traps had a high rate of failures, caused by mammals and extreme climatic events, for which reason it is of uttermost importance to choose the right sampling method to detect potential arthropod pest species. The same insect orders determined for herbivory were also found to represent the largest percentage of prey items retrieved from stomach content samples in monitored amphibians and reptiles. Analyses of quantitative arthropod assessments and dietary indicated that both reptiles and amphibians are significant predators of several potential arthropod pest species. This highlights the important role of the herpetofauna controlling pest species abundances and impacts and therefore providing food resources for livestock in the tropical dry forest system of northeastern Brazil.

**Keywords:** Amphibians, Caatinga, herbivory, natural food resources, pest-control, reptiles