



Assemblages of lizards and amphibians in two types of organic shade-coffee plantations in Mexico



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Shaded plantations, such as shaded coffee, are recognized worldwide for their potential use as ecologically-friendly matrices that might be compatible with long-term conservation goals in anthropogenic landscapes. Diversity of some groups of animals living in shade coffee plantations, such as birds and bats has been well studied. However, relatively little is known about the diversity and abundance of the herpetofauna in such systems. The goal of this study was to quantify the richness and abundance of amphibians and lizards in two kinds of shade coffee plantations, traditional polyculture and commercial polyculture, and in a forest site. The traditional polyculture plantations have a greater complexity in vegetation structure and composition, when compared to the commercial polyculture plantations.



Location of study site in Mexico



Traditional polyculture (TPC)

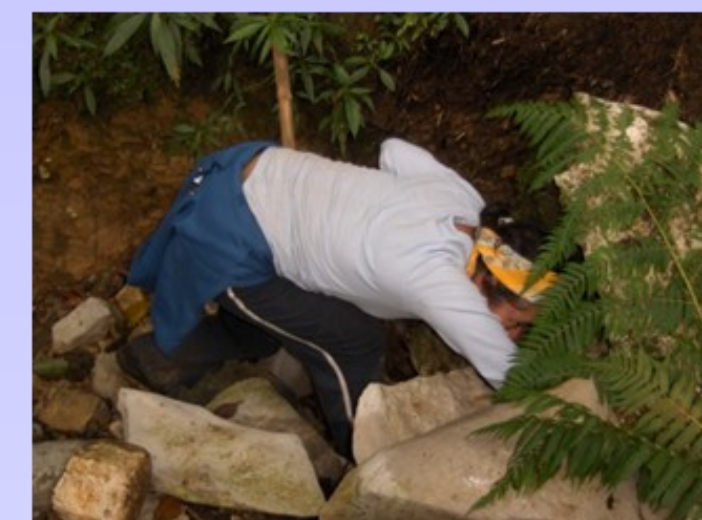


Commercial polyculture (CPC)



Conserved forest (Forest)

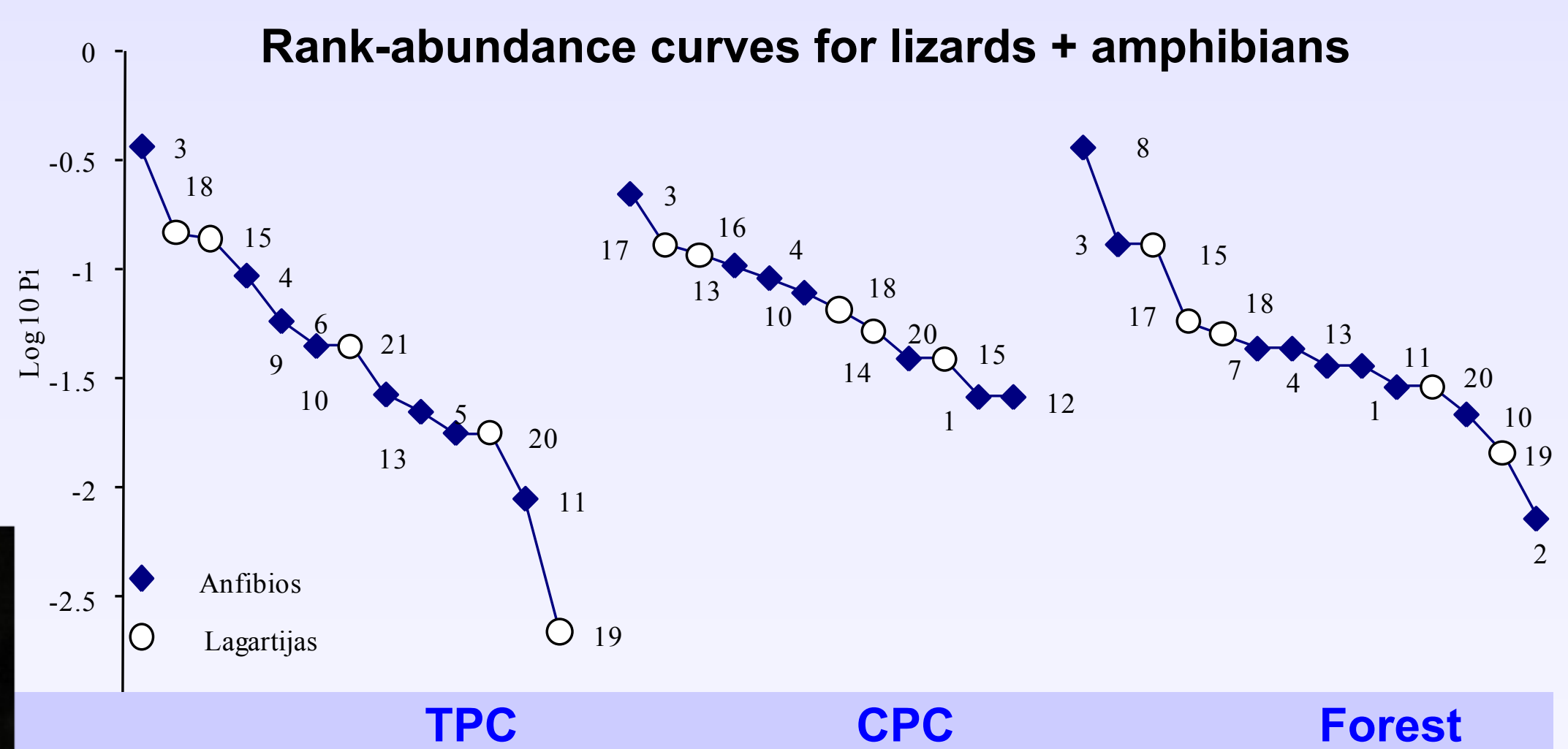
Six coffee plantations and one forest site were studied in the municipality of Cuetzalan, in the Sierra Norte de Puebla, Mexico. Abundance, richness and diversity of amphibians and lizards were evaluated using an active capture method. Lizards and amphibians were captured during ten sampling sessions, including both diurnal and nocturnal sampling, with a total effort of 1160 hours/person.



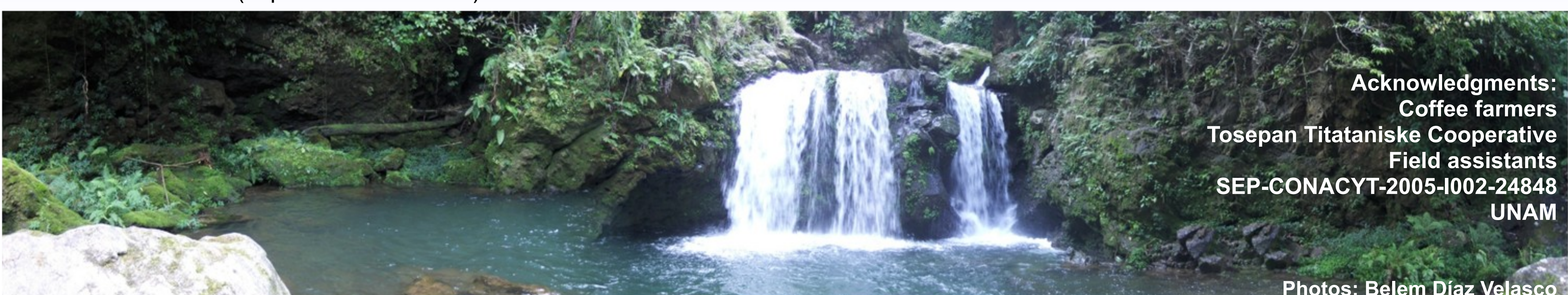
A total of 435 individuals (Forest: 137, TPC: 222, CPC: 76) were registered, belonging to 21 species: 14 amphibians and 7 lizards. Individual sites varied tremendously in the abundance of lizards and amphibians. Consequently, this variable did not show statistically significant differences between the two coffee-growing systems. Lower abundances of both amphibians and reptiles were observed in the commercial polyculture, when compared to the forest site. Observed species richness of amphibians and lizards was similar among the three habitats. However, in terms of amphibian estimated total species richness we observed the following pattern: forest > traditional polyculture > commercial polyculture. Yet, the commercial polyculture showed greater equitability, and as a consequence had higher values for the diversity index, when compared to the commercial polyculture and the forest.

# Individuals	TPC1	TPC2	TPC3	TPC total	CPC1	CPC2	CPC3	CPC total	Forest
Frogs	79	32	28	139	20	0	12	32	92
Salamanders	1	0	3	4	13	0	0	13	6
Lizards	58	9	12	79	7	1	23	31	39

Seven species were present in all habitats. Five species were only found in TPC, three only in CPC, and three only in the forest. The frog *Craugastor rhodopis* was the dominant amphibian in both coffee systems, while the frog *Ecnomiohylla miotypanum* was the most common amphibian in the forest. In terms of lizards the TPC was dominated by *Anolis naufragus* and *Scincella silvicola*, while the CPC was dominated by *Sceloporus variabilis* and *Corytophanes hernandezii*. In the forest *Scincella silvicola* dominated the lizard assemblage.



In this area of Mexico, where very little natural vegetation remains, shaded coffee plantations, and in particular those in the Traditional Polyculture management system, constitute very important sites for the conservation of the herpetofauna. All the plantations studied were under organic production, i.e. without the addition of agrochemicals. This might be of particular importance for animal groups such as amphibians, but the effect of non-organic production on this group of animals remains to be determined. Among important management practices that farmers could apply for the direct benefit of the herpetofauna include: (i) the maintenance of small ponds within their plantations, and (ii) an adequate management of domestic animals which are normally allowed to roam freely in the plantations (in particular chickens).



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