

Run and hide at your nearest refuge: the bromeliad invasion of earthworm *Perionyx excavatus* in trees of Mexican coffee plantations.



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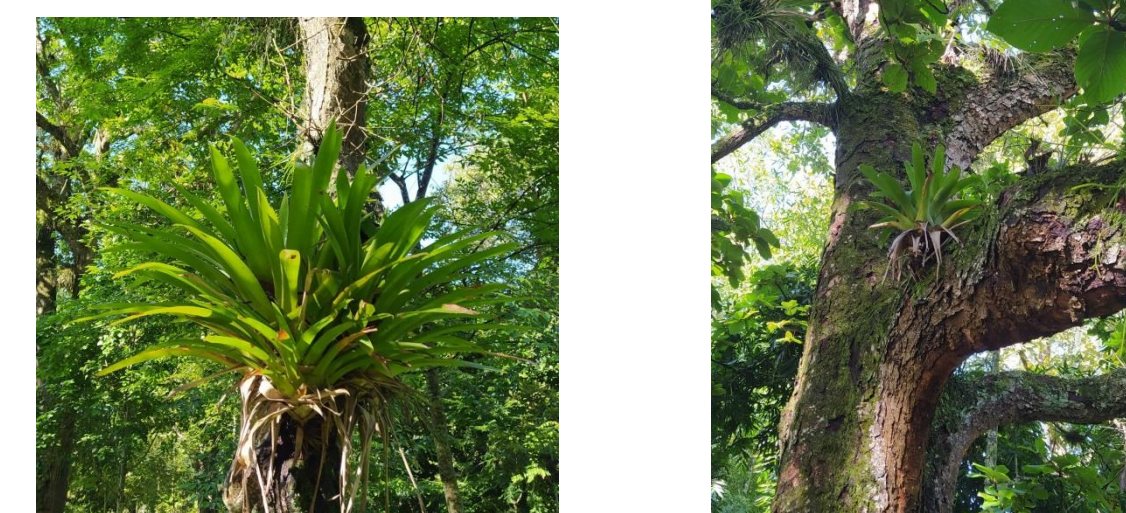
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INTRODUCTION:

- Perionyx excavatus* is an Asiatic epigeic earthworm that is currently found in several tropical countries. Outside its original distribution range, this earthworm has been successfully used in the vermicomposting of different organic residues. In Mexico this species has been found only in a small geographic region of central Veracruz, at 1080 -1250 m.a.s.l. Records for this region are associated to coffee pulp residues that were abandoned close to streams or coffee plantations. It has been also recorded in bromeliads.



Perionyx excavatus



Bromeliads of Coffee Plantations



A Coffee Plantation

OBJECTIVES:

- Determine if *P. excavatus* is able to survive in the litter of coffee plantations
- Determine if *P. excavatus* is a common inhabitant of bromeliads
- Determine if this species is more frequent in bromeliads/trees located inside or outside coffee plantations

METHODS:

Search (year 1998) in soils of Coffee plantations (8) and cloud forests (2) sites :

- TSBF standard method : five monoliths of 25 x 25 cm and 30 cm depth/ site

Search (2018) in a varying number of bromeliad plants from 24 trees of five different species (Inga vera, Inga inicuil, Inga oerstediana and Jacaranda mimosifolia):

- 12 trees inside coffee plantations
- 12 trees outside coffee plantations (isolated in pastures)

Abundance and frequency per item (monolithes or bromeliads) were recorded.

RESULTS:

In soils:

- P. excavatus* was extremely rare in coffee plantations or cloud forest soils. It was found in 3 out of the 12 studied plantations (presence in 9% of monoliths and with abundances of 0.18 ind/monolith) and always limited to litter (78% of individuals) or the first 5 cm of soil depth (22%). It represented 1% of the total amount of earthworms found.

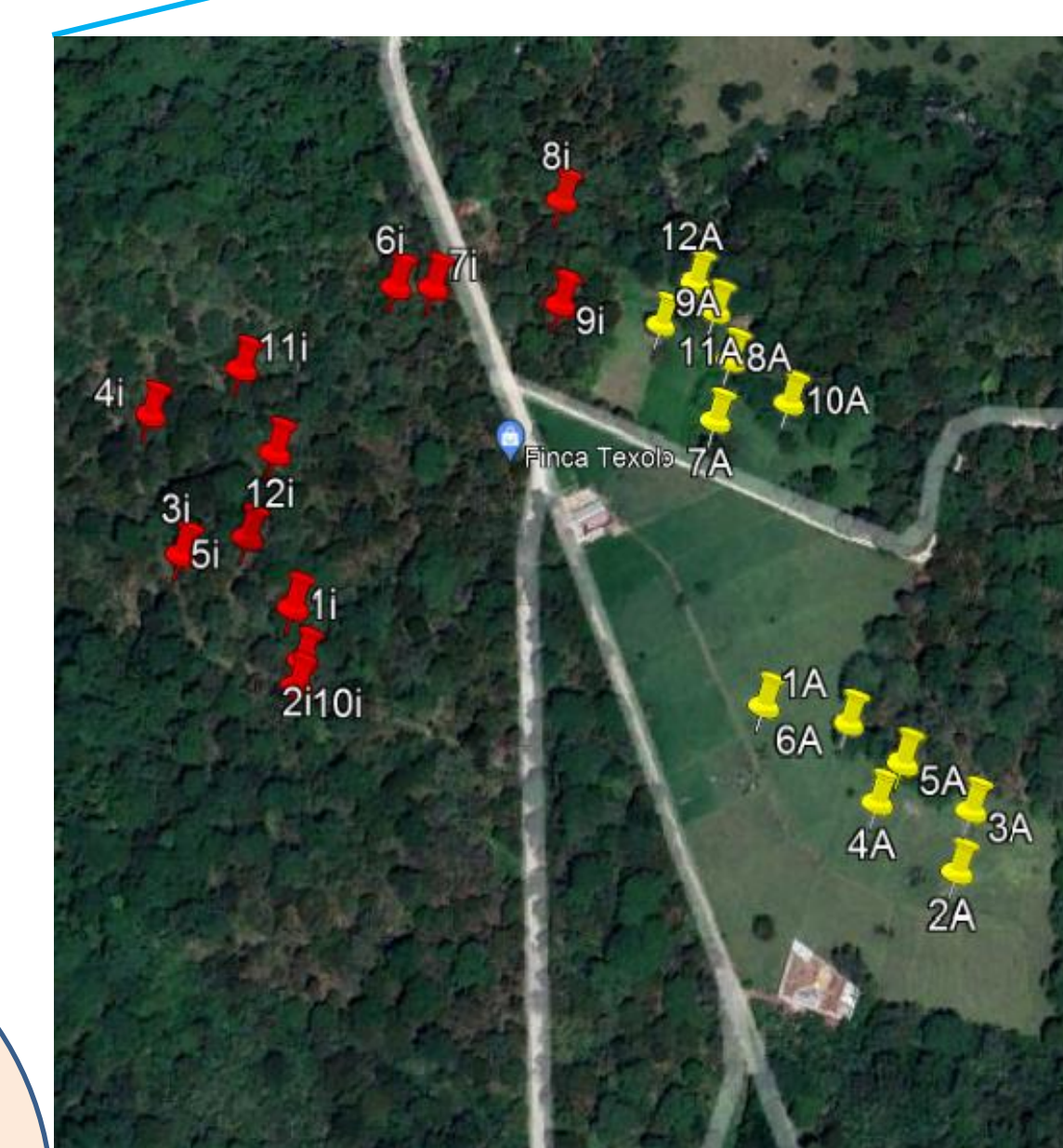
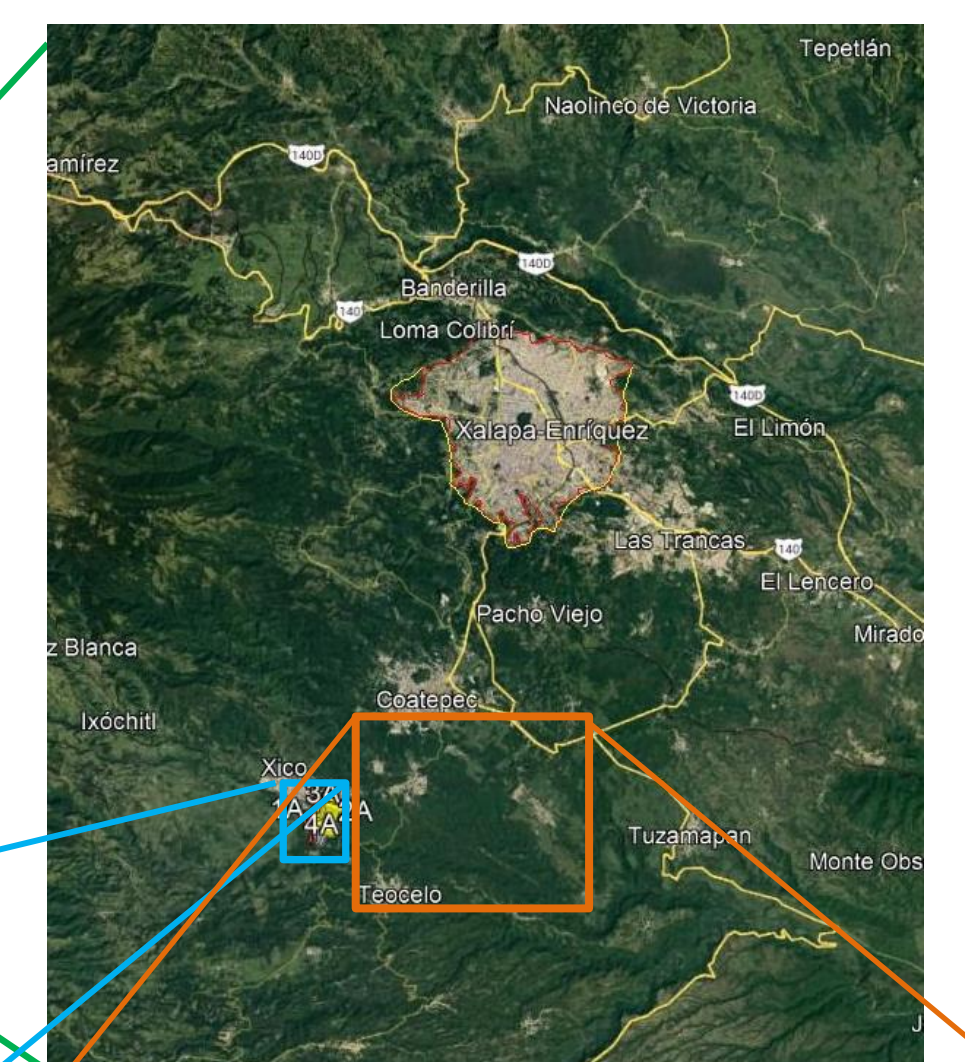
In Trees/Bromeliads:

- It was found in 58% of sampled trees (14 worms/tree), and only within tank bromeliads.
- Outside plantations it was found in 92% of trees (28 worms/tree) ; inside plantations 25% presented worms (0.25 worms/tree).

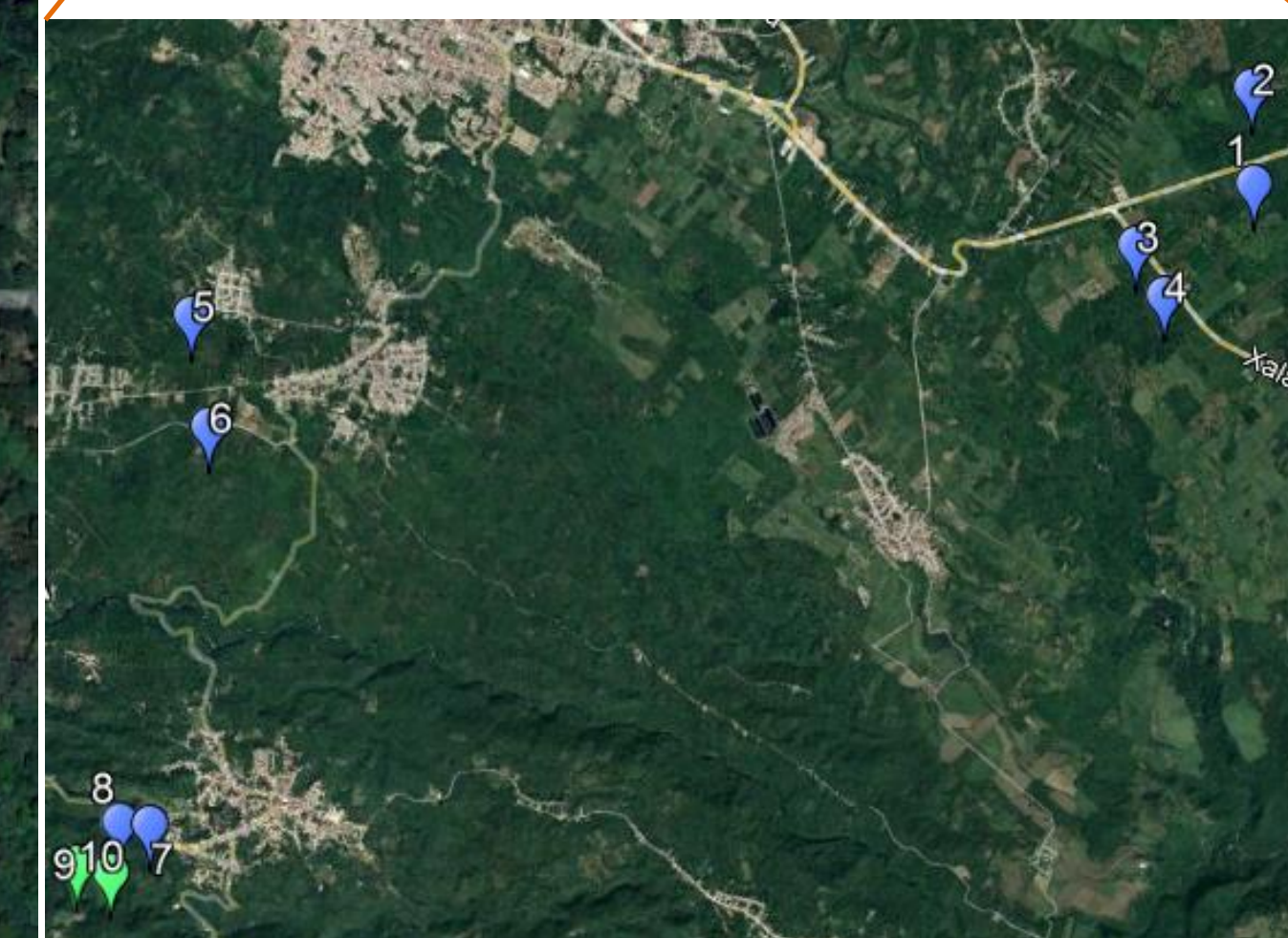
CONCLUSIONS:

- P. excavatus* is not able to prosper in the soil litter of coffee plantations and cloud forests .
- This species arrived to these plantations in the coffee pulp waste left outside plantations.
- Once all coffee pulp was decomposed, *P. excavatus* left the compost pile and looked for the nearest suitable habitat: the bromeliad plants of the nearest trees- i.e. the isolated trees outside plantations.
- Future studies should clarify preference of this exotic worm for tank bromeliads species and the effect over phytotelmata associated community.

Sampling sites in the Coffee region of Xalapa-Coatepec, state of Veracruz, MEXICO



Bromeliad and tree sampling inside and outside coffee plantations



Soil sampling in cloud forests and coffee plantations

