



HAL
open science

Can earthworm activities induce better phosphorus availability and resistance to banana plant-parasitic nematodes ?

Gladys Loranger-Merciris, Brunise Deloné-Louis-Jeune, Harry Ozier-Lafontaine

► To cite this version:

Gladys Loranger-Merciris, Brunise Deloné-Louis-Jeune, Harry Ozier-Lafontaine. Can earthworm activities induce better phosphorus availability and resistance to banana plant-parasitic nematodes ?. 47th Annual Scientific Meeting of the Caribbean Food Crops Society, Jul 2011, Lloyd Erskine Sandiford Centre, Bridgetown, Barbados. hal-04089318

HAL Id: hal-04089318

<https://hal.univ-antilles.fr/hal-04089318>

Submitted on 13 Jun 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

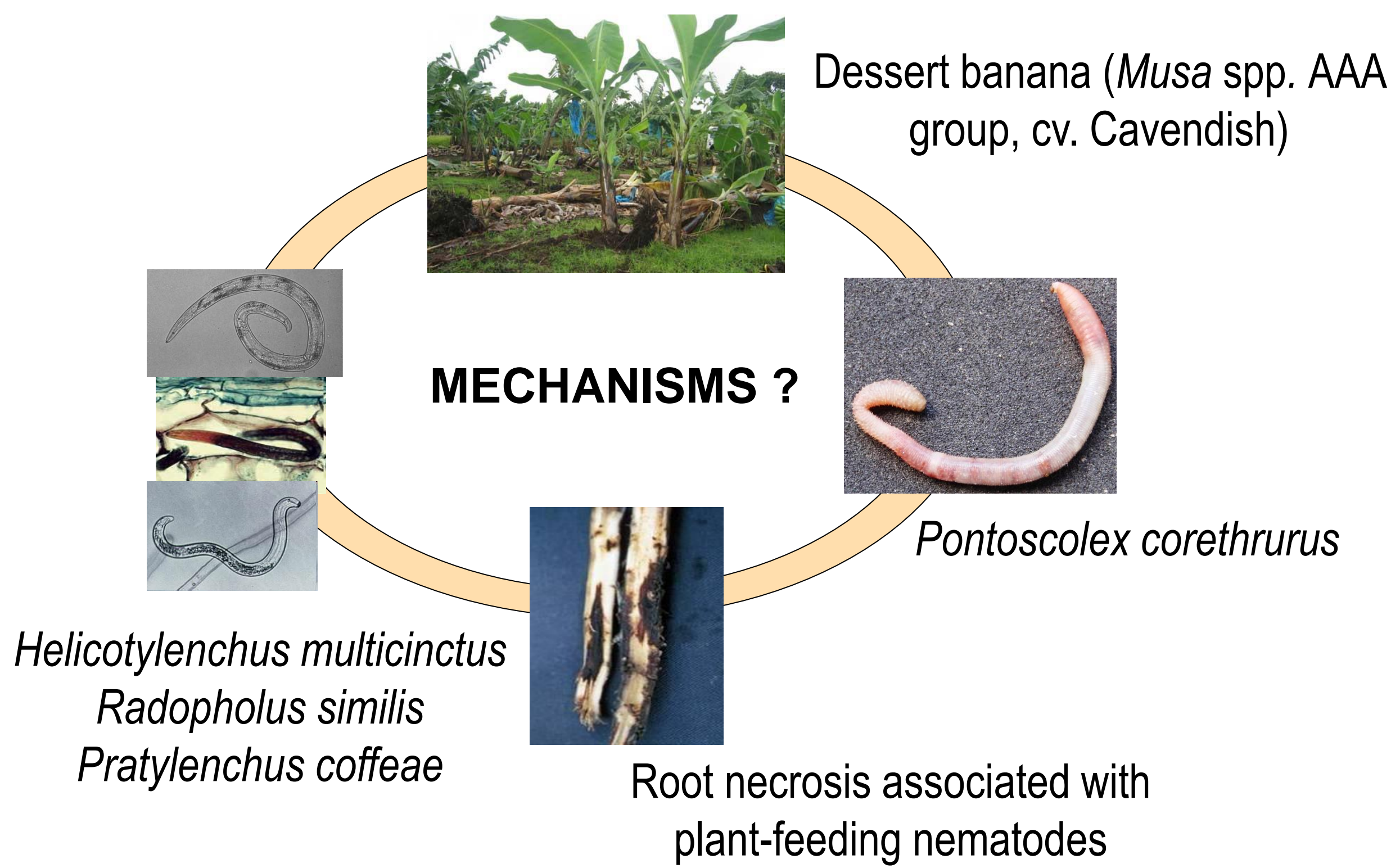
Can earthworm activities induce better phosphorus availability and resistance to banana plant-parasitic nematodes ?

G. LORANGER-MERCIRIS^{a,b}, B. DELONÉ LOUIS-JEUNE^{a,b} and H. OZIER-LAFONTAINE^b

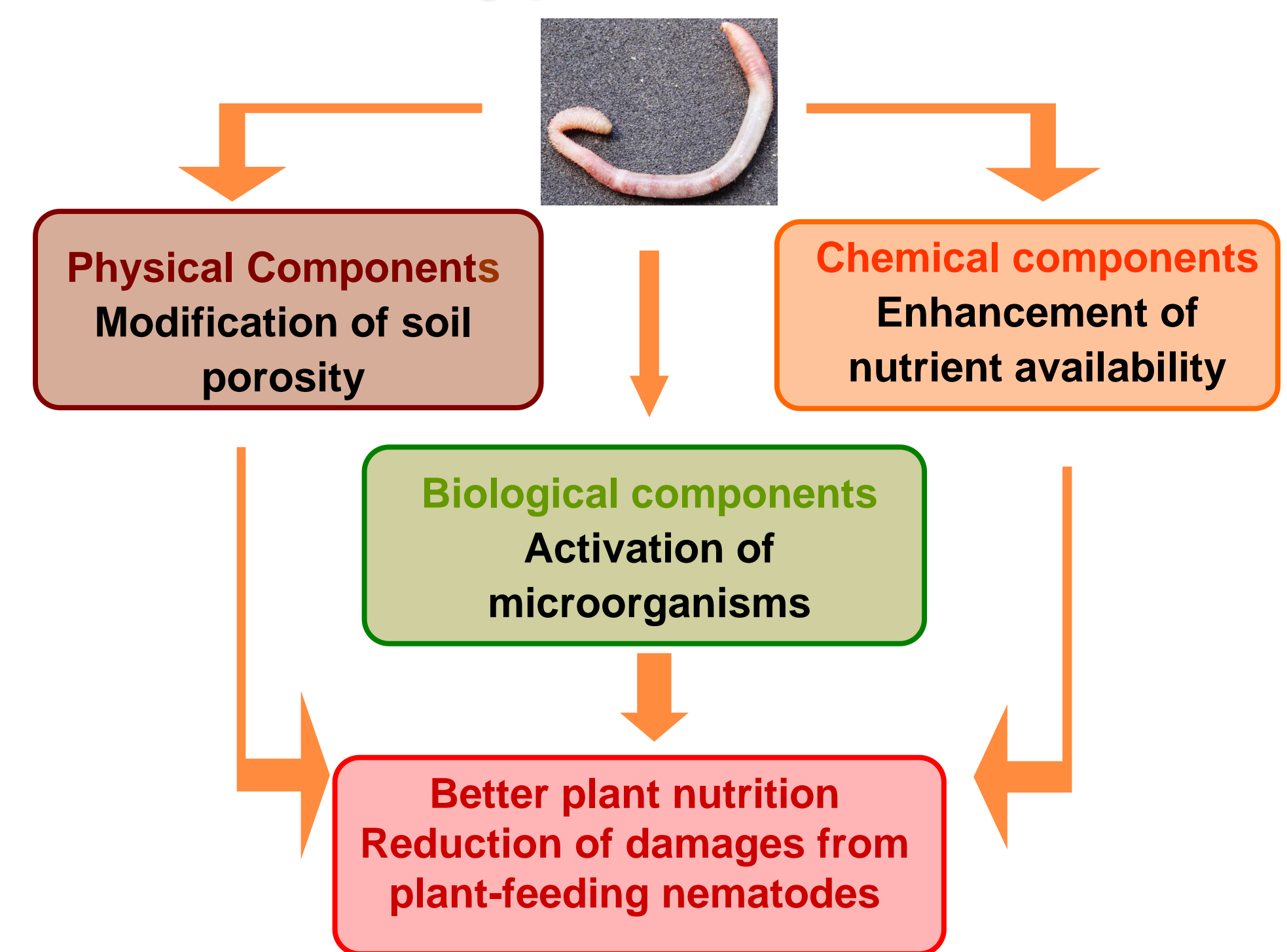
^a Université des Antilles et de la Guyane; ^bINRA, UR1321, ASTRO AgroSystèmes TROPICAUX, F-97170, Petit-Bourg, Guadeloupe.
E-mail : gladys.loranger-merciris@antilles.inra.fr - dbrunise@yahoo.fr - harry.ozier-lafontaine@antilles.inra.fr

Background and Objectives

How earthworm activity affect the pathogenicity of the three main plant-feeding nematodes associated with dessert banana in Guadeloupe (French West Indies) ?



Hypothesis



Materials and Methods

Greenhouse experiment at the INRA station in Guadeloupe FWI

Complete banana vegetative cycle: 337 days.

Macrocosmes: 20 kg pots filled up with andosol.

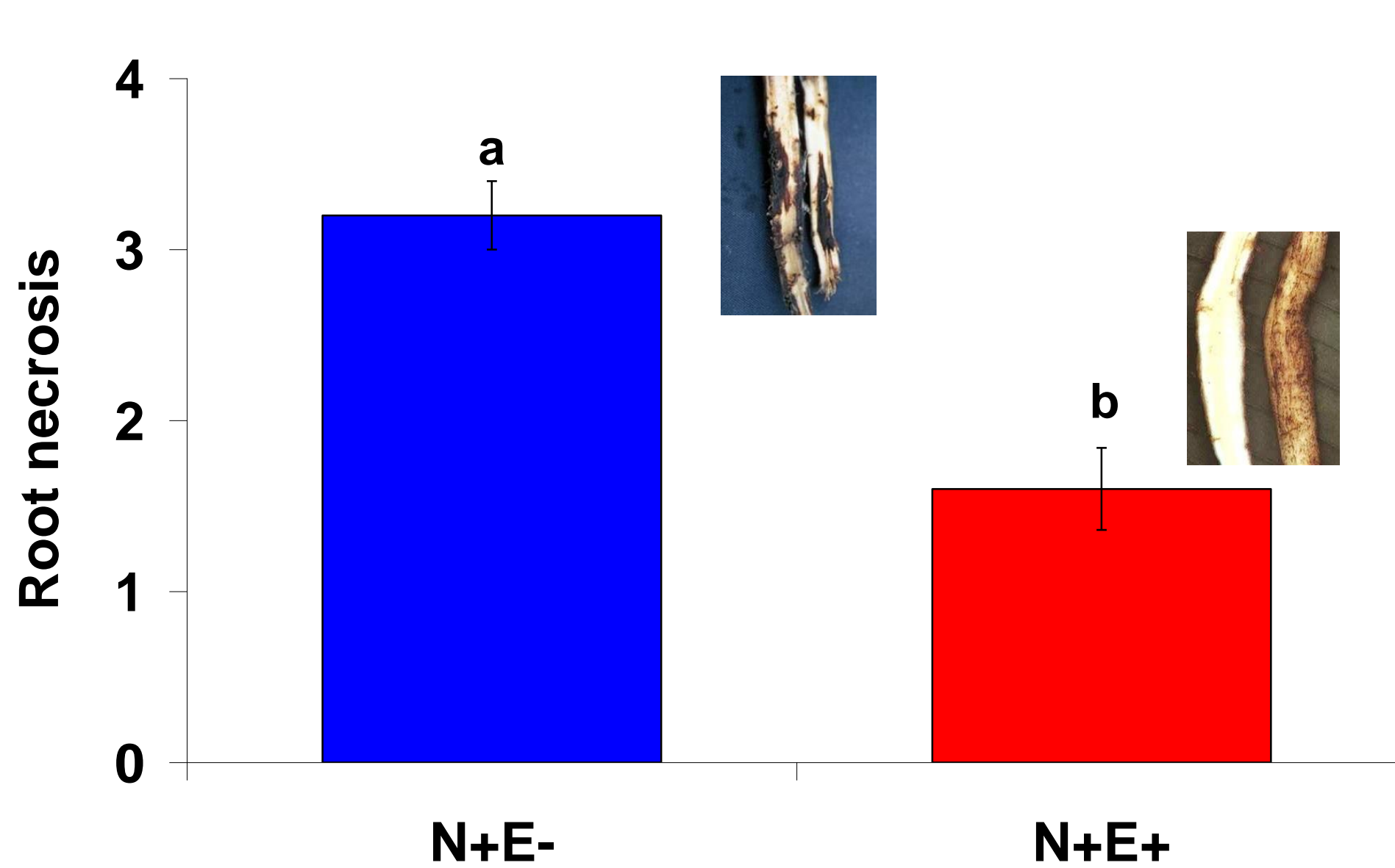


- Earthworms (E): *Pontoscolex corethrurus*
- 3 nematodes (N): *Radopholus similis*, *Helicotylenchus multicinctus*, *Pratylenchus coffeae*.
- 4 treatments × 5 replicates (N-E- ; N-E+ ; N+E- ; N+E+)

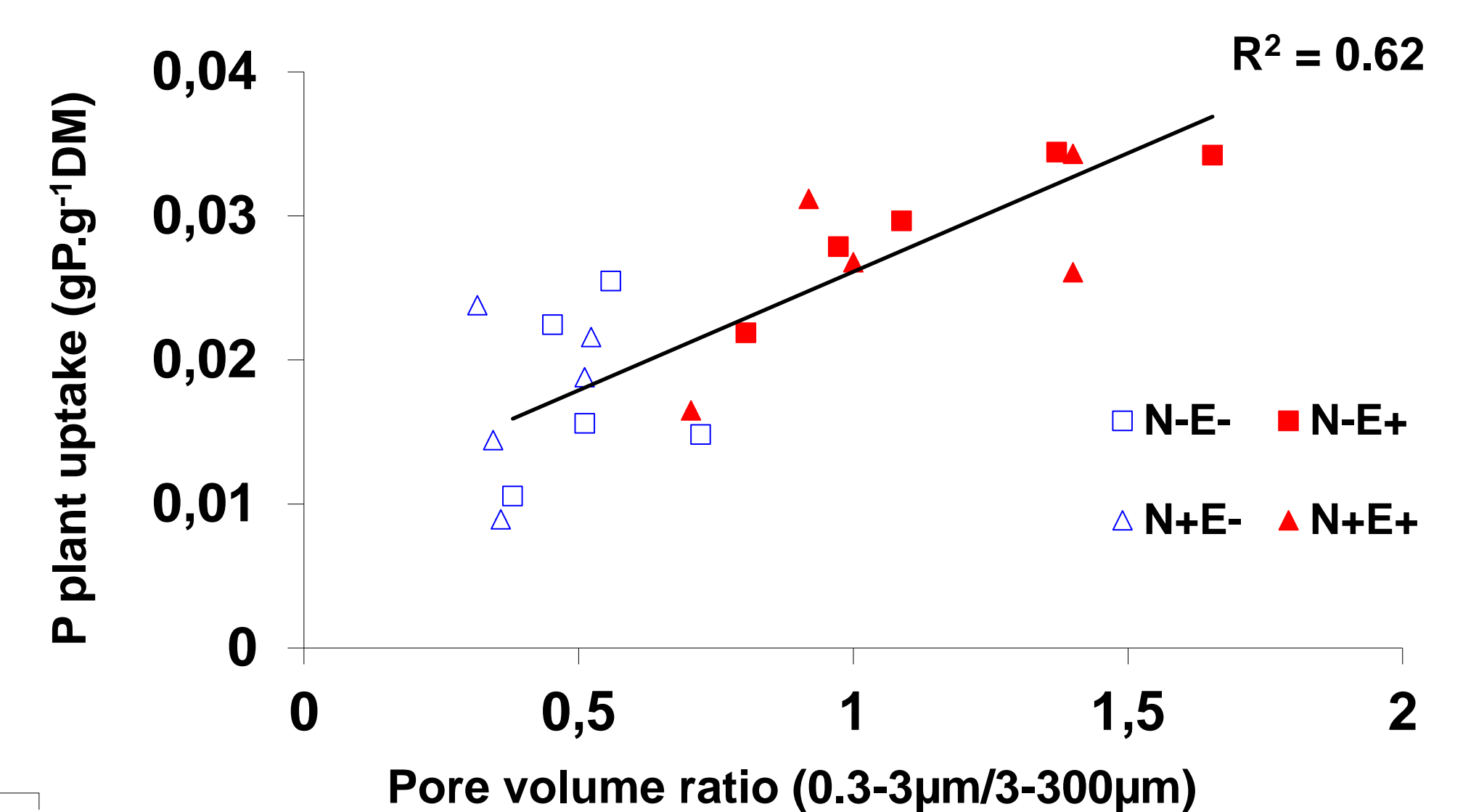
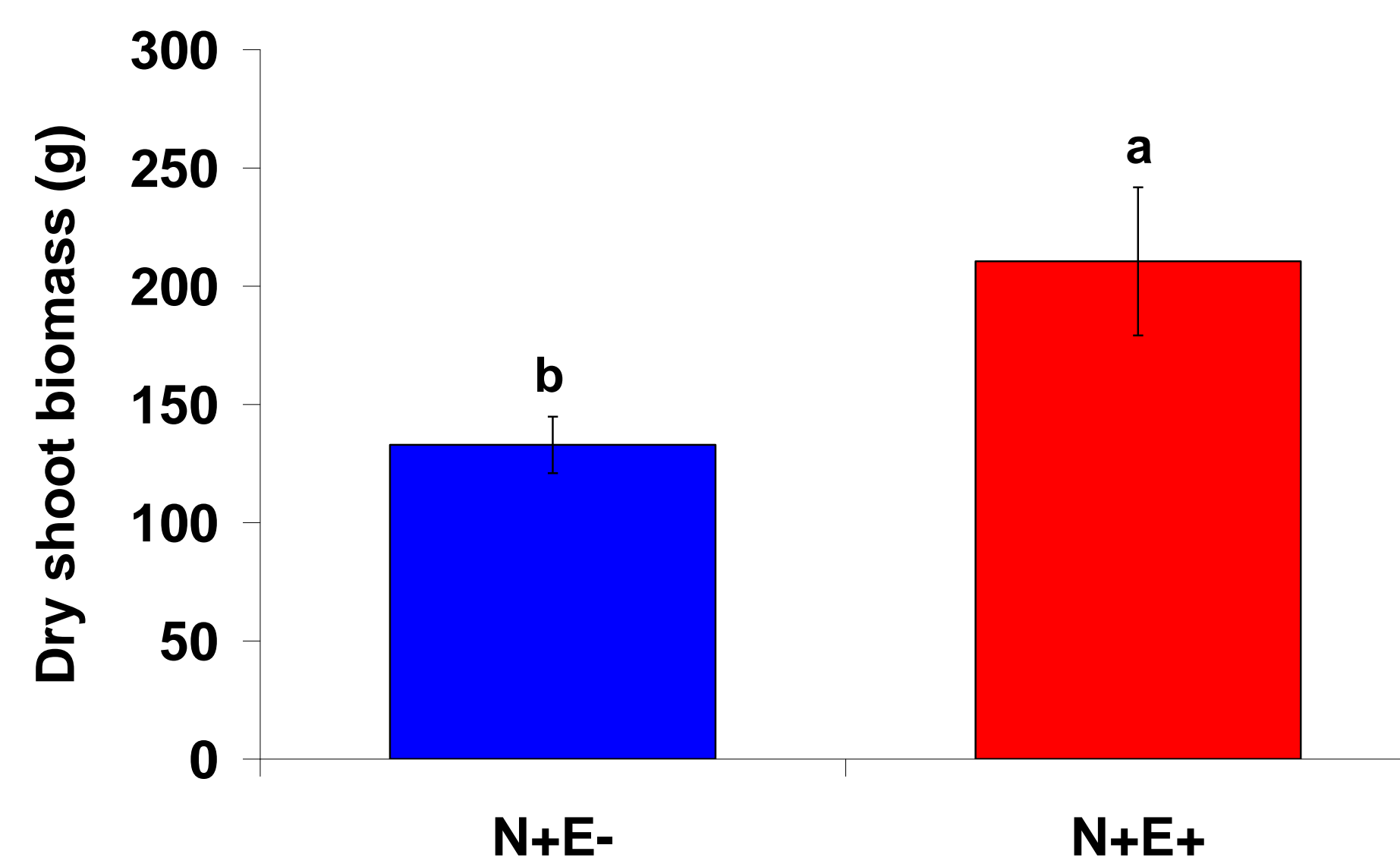
Measurements

- **Plants:** shoot and root biomass, root necrosis, leaf N and P content
- **Soil physical and chemical properties:** Shrinkage curves: casts and centimetric aggregates, P, N
- **Biological compartment:** number of earthworms and nematodes, microbial activity

Results



Earthworm activities induce the reduction of root necrosis and the increase of banana growth.



P. corethrurus activities transform mesobiotic porosity to microbiotic, creating better conditions to microorganisms activity, stimulating soil mineralisation and P availability → better conditions for plant growth.

Conclusion

Phosphorus uptake induced by *P. corethrurus* feeding activity resulted in a better plant nutrition and a better tolerance to plant-feeding nematodes. Besides, the reduction of the mesobiotic porosity by bioturbation could also have disturbed the nematodes activities during their soil phase and contributed to the reduction of their damage.

Caribbean Agroecology Networking Symposium

"Productive Agrosystems and Resources Conservation in an Island Environment: an Agroecological Challenge for Caribbean Sustainable Development"
47th Annual Scientific Meeting of the Caribbean Food Crops Society, Lloyd Erskine Sandiford Centre, Bridgetown, Barbados, July 3-9, 2011