Plant-parasitic nematodes in potato crops in Portugal: patterns and influencing factors

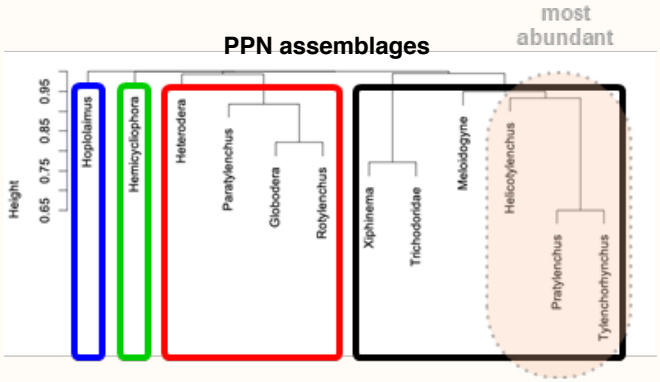
Ana Martins, M. Teresa M. Almeida, Sofia R. Costa
CBMA - Centre of Molecular and Environmental Biology, University of Minho, Braga, Portugal

Potato, an important food crop, is susceptible to several pests and pathogens, including plant-parasitic nematodes (PPN), that reduce yield.
Research has mainly focused on effects of single PPN on potato cropping, and the assemblages of PPN genera have seldom been considered.
We aimed to characterise the PPN communities associated with potato fields and relate PPN assemblages to crop and abiotic factors to infer on their ecology.

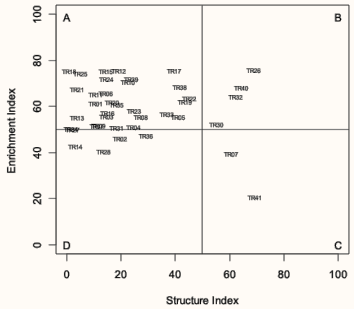
Field survey in major potato cropping regions in Portugal

- Soils sampled at full plant growth (N=40)
- Nematode community analyses, assemblages of PPN genera
- Climatic & geological parameters collected from available databases
- Soil physical-chemical parameters analysed
- Cropping
- History and crop performance: farmers interviews

PPN assemblages

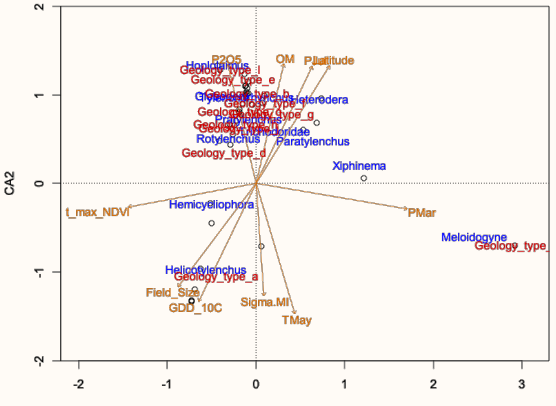


Nematode community profile



Drivers of PPN assemblages

Variable	r^2	*p*
Geology	0.80	<0.01
P. March	0.75	0.02
Longitude	0.62	<0.01
T. May	0.59	<0.01
GDD 10°C	0.55	<0.01
P. July	0.54	<0.01
Field size	0.53	0.03
t max NDVI	0.53	<0.01
OM	0.48	<0.01
P2O5	0.48	0.01
Sigma MI	0.40	0.02



- Mostly simplified, N-enriched soil food webs - conducive to pests and pathogens
- Abundances of PPN genera related to edaphoclimatic factors, but also driven by management (OM, nutrients, field size) and nematode community maturity
- Potato cropping must be re-designed to increase agroecosystem resilience and prevent yield losses whilst reducing external inputs.

TREND

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