Advances towards the knowledge of the root knot nematode *Meloidogyne luci*

Ivânia Esteves[1], Joana Cardoso[1], Duarte Santos[1], António Correia[1], Beatriz Cantarinho[1], Olímpia Sobral[1], Isabel Abrantes[1], Maria L. Inácio[2], Filomena Nóbrega[2], Leidy Rusinque[1,2] and Carla Maleita[1,3]

[1]Centre for Functional Ecology - Science for People & the Planet, Department of Life Sciences, University of Coimbra, Calçada Martim de Freitas, 3000-456 Coimbra, Portugal, iesteves@uc.pt, [2]Instituto Nacional de Investigação Agrária e Veterinária (INIAV, I.P.), Quinta do Marquês, 2780-159 Oeiras, Portugal, [3]Chemical Process Engineering and Forest Products Research Centre, Department of Chemical Engineering, University of Coimbra, Rua Sílvio Lima, Pólo II, Pinhal de Marrocos, 3030-790 Coimbra, Portugal

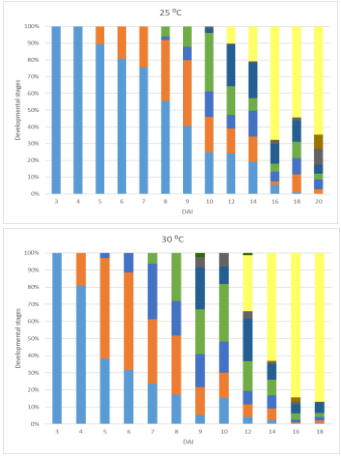
Project KnowLuci

The root knot nematode (RKN) *Meloidogyne luci* is currently included in the Alert List of the European Plant Protection Organization due to the potential negative impact on economically important crops.

Objectives: 1) to assess the thermal requisites of *M. luci*; 2) to evaluate the host status of 35 plant cultivars to a Portuguese *M. luci* isolate and 3) to develop a molecular method for quick detection and reliable discrimination of this RKN species.

Thermal requisites

M. luci development occurred at 15, 20, 25 and 30, being most suited to soil temperatures around 25°C.



Postembryonic development of *M. luci* on tomato cv. Coração-de-Boi from 3 days after inoculation (DAI) until deposition of eggs in gelatinous matrix. ( ) Vermiform J2; ( ) swollen and sexually undifferentiated J2; ( ) sexually differentiated J2; fourth-stage ( ) female and ( ) male; adult ( ) female and ( ) male shortly after fourth moult; ( ) adult female; ( ) adult male.

Host suitabilility

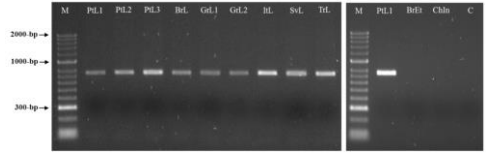
M. luci reproduced (Rf>1, gall index, GI =4-5) on 24 of the 35 cultivars. Nematode reproduction was prevented in 11 cultivars:

Crop	Species	Cultivar/ Rootstock	Status (60 DAI, Pi=5000 eggs)
Carrot	*Daucus carota*	—	**Hypersusceptible** (Rf<1; GI>2)
Passionfruit	*Passiflora edulis*	—	
Lettuce	*Lactuca sativa*	Cocktail	
Cabbage	*Brassica oleracea*	Bacalan Coração Lombarda	
Spinach	*Spinacia oleracea*	Tayto	
Tomato	*Solanum lycopersicum*	Actimino Briomino Veinal Vimeiro	**Resistant** (GI=1-2; 0.0<Rf<0.1)

Maleita et al., *Phytopathologia mediterranea* (*in press*)

Molecular detection

The Mlf and Mlr primer set was designed, and a species-specific SCAR-PCR was shown to be accurate and highly sensitive, requiring minimal DNA template for detection of *M. luci* target sequences, without amplification of other *Meloidogyne* spp., including closely related- RKN species such as *M. ethiopica* and *M. inornata*.



SCAR-PCR products (~770 bp specific fragment) for *M. luci* (isolates PtL1, PtL2, PtL3, BrL, GrL1, GrL2, ItL, SvL and TrL), *M. ethiopica* (isolate BrEt) and *M. inornata* (isolate Chln). M—DNA marker (HyperLadder II, Bioline); C—Negative control.

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Conclusions:

- *M. luci* is adapted to the Portuguese climate conditions, suited to soil temperatures ranging 20-30°C.
- Most (68.5%) cultivars were susceptible to the nematode. The resistant cultivars identified are recommended for management of *M. luci* populations.
- *M. luci* can be differentiated from species within the Ethiopica group using species specific primers. The developed methodology is useful for routine diagnosis purposes.

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