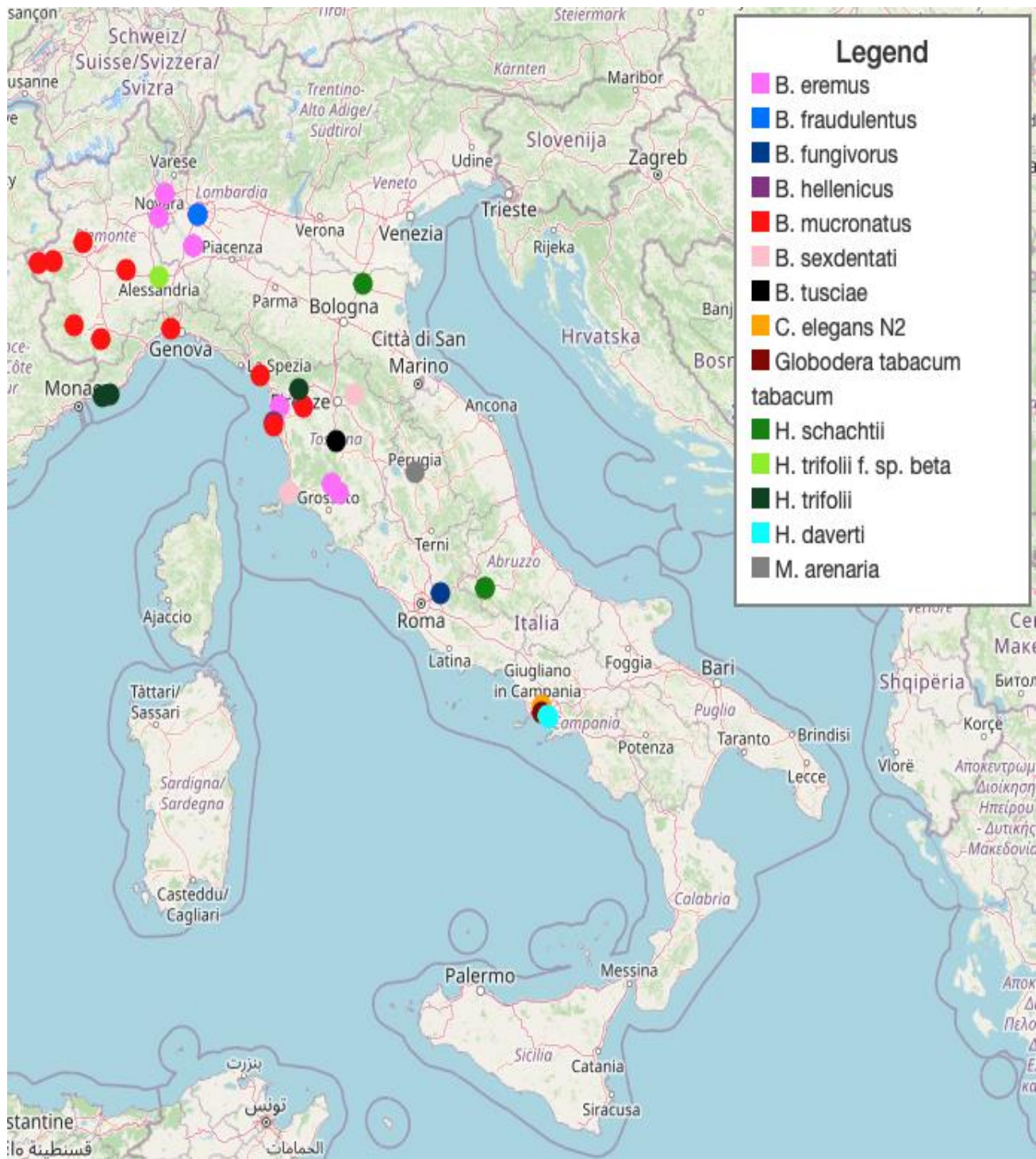
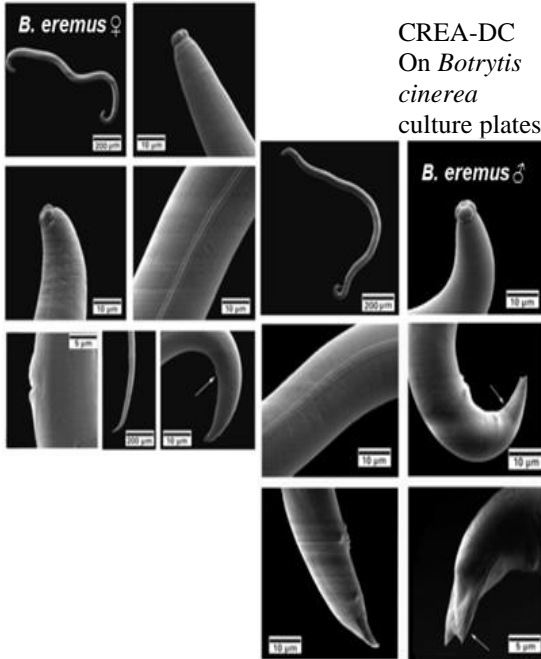
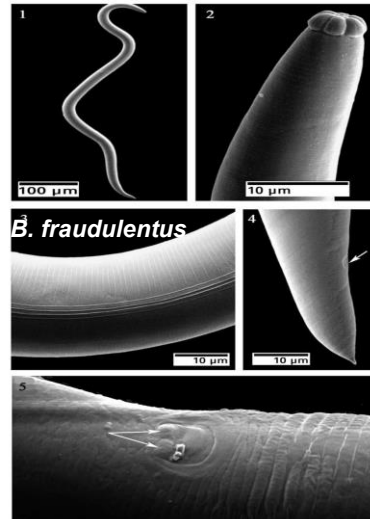


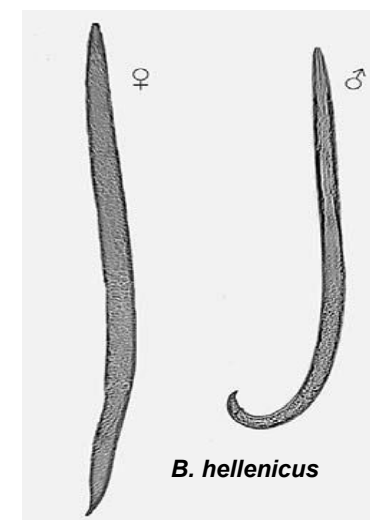
**Map shows the locations of Plant Parasitic Nematodes (PPN) occurrence sites in Italy**  
**The colored dots represent differential PPN species**



**Below, the IPNC Italian Plant Nematode Collection including a free-living and one entomopathogen. 22 species and 62 populations at the CREA-DC (Florence-Italy)**

GENOTYPE	Host	ID-Zone	Freezing Date	Freezing Method	Sample Type	DNAs & Analysis	Status/ References	in VIVO cultures
<i>Bursaphelenchus eremus</i>	w, wood	IT17 (w) (Montefalcone-Pisa Italy)				YES	Carletti et al. Redia 2007 XC: 3-21 <a href="https://www.researchgate.net/profile/Tiziana-Irdani/publications">https://www.researchgate.net/profile/Tiziana-Irdani/publications</a>	CREA-DC On <i>Botrytis cinerea</i> culture plates
<i>Bursaphelenchus eremus</i>	w, Oak	IT18 (w) (Bosco Pizzone- Milano Italy)	2006	LCTV*	Larvae	YES	Irdani et al., *Cryobiology 52 (2006) 319–322"	
<i>Bursaphelenchus eremus</i>	w, <i>Quercus cerris</i>	IT19 (Paganico-Grosseto)	2006	LCTV*	Larvae	YES	"	
<i>Bursaphelenchus eremus</i>	w, Oak	IT20 (Bosco Grande- Pavia Italy)	2007	LCTV*	Larvae		Irdani et al. *Cryobiology 52 (2006) 319–322	
<i>Bursaphelenchus eremus</i>	w, Oak	IT21 (Brugheria del Dosso- Varese Italy)	2006	LCTV*	Larvae	YES	"	
<i>Bursaphelenchus eremus</i>	w, Oak	IT22 (w) (Boscaccio-Pavia Italy)					"	
<i>Bursaphelenchus eremus</i>	w, Oak	IT37 (w) (L28 Novara, Italy)					"	
<i>Bursaphelenchus eremus</i>	i, insect from conifera	IT45 (S.Rossore-Pisa, Italy)					"	
<i>Bursaphelencus eremus</i>	w, Oak	DE39	2007	LCTV*	Larvae		"	
<i>Bursaphelencus fraudulentus</i>	w, <i>Quercus robur</i>	IT23 (Bosco Pizzone-Milano Italy)				YES	Irdani T. 1995 Redia LXXXVIII, 27-35 <a href="https://www.researchgate.net/profile/Tiziana-Irdani/publications">https://www.researchgate.net/profile/Tiziana-Irdani/publications</a>	CREA-DC
<i>Bursaphelencus fraudulentus</i>	w, <i>Carpinus betulus</i>	IT34 (Bosco Moro-Milano Italy)	2007	LCTV*	Larvae	YES		

GENOTYPE	Host	ID-Zone	Freezing Date	Freezing Method	Sample Type	DNAs & Analysis	Status/ References	in VIVO cultures
<i>Bursaphelenchus fungivorus</i>	w, <i>Callitris columellaris</i> packaging wood	CH-IT1 F. Mueller (China)				YES	Ambrogioni et al., 2003 Redia LXXXVI <a href="https://www.researchgate.net/profile/Tiziana-Irdani/publications">https://www.researchgate.net/profile/Tiziana-Irdani/publications</a>	
<i>Bursaphelenchus fungivorus</i>	bulbi zafferano	(Lazio, Italy)						
<i>Bursaphelenchus hellenicus</i>	i, <i>Hyliurgus ligniperda</i> F.	IT39	2008	LCTV*	Larvae	YES	Carletti et al., 2008 Redia, XCI p. 67-71 <a href="https://www.researchgate.net/profile/Tiziana-Irdani/publications">https://www.researchgate.net/profile/Tiziana-Irdani/publications</a>	
<i>Bursaphelenchus hellenicus</i>	w, <i>P. pinea</i> L., <i>P. pinaster</i> Aiton	IT41	2007	LCTV*	Larvae	YES		
<i>Bursaphelenchus irokophilus</i>	w, <i>Milicia excelsa</i> Welw (Iroko)	CA-IT (Camerum)					Torrini et al., 2019 Nematology pp. 1-13 <a href="https://doi.org/10.1163/15685411-00003268">https://doi.org/10.1163/15685411-00003268</a>	
<i>Bursaphelenchus minutus</i>	i, <i>Orthotomicus erosus</i>	IT42	2008	LCTV*	Larvae		Carletti et al., 2008 Redia, XCI p. 111-117. Torrini et al 2016 Scandinavian J. of Forest Research <a href="https://doi.org/10.1080/02827581.2016.1254278">https://doi.org/10.1080/02827581.2016.1254278</a>	



GENOTYPE	Host	ID-Zone	Freezing Date	Freezing Method	Sample Type	DNAs & Analysis	Status/ References	<i>in VIVO</i> cultures
<i>Bursaphelenchus mucronatus</i>	w, <i>Pinus sylvestris</i>	IT5 (Oulx-Torino, Italy)				YES	"	
<i>Bursaphelenchus mucronatus</i>	w, <i>Pinus nigra austriaca</i>	IT6 (Variselle-Torino, Italy)				YES	"	
<i>Bursaphelenchus mucronatus</i>	w, <i>Pinus strobus</i>	IT7 (Dronero-Cuneo, Italy)				YES	"	
<i>Bursaphelenchus mucronatus</i>	w, <i>Pinus sylvestris</i>	IT8 (Monte Calvario-Cuneo, Italy)				YES	"	
<i>Bursaphelenchus mucronatus</i>	i, <i>Monochamus galloprovincialis</i> from <i>Pinus Pinaster</i>	IT12 (Prati di Prà, Genova)	2006	LCTV*	Larvae	YES	Irdani T., 2000 Nemat. Med. 28:11-120; Irdani T. et al., 1995 Redia LXXVIII, 149-161; Suppl. Nem. Medit. 23, 99-106; Irdani T., Nemat. Mediterranea 2000, 28: 73-76 <a href="https://www.researchgate.net/profile/Tiziana-Irdani/publications">https://www.researchgate.net/profile/Tiziana-Irdani/publications</a>	CREA-DC
<i>Bursaphelenchus mucronatus</i>	w, <i>Pinus pinaster</i>	IT13 (Marina di Massa-Massa Italy)				YES		
<i>Bursaphelenchus mucronatus</i>	w	IT16 (Montefalcone-Pisa Italy)					"	
<i>Bursaphelenchus mucronatus</i>	w	IT38 (Piedmont, Italy)						

GENOTYPE	Host	ID-Zone	Freezing Date	Freezing_ Method	Sample Type	DNAs & Analysis	Status/ References	<i>in VIVO</i> cultures
<i>Bursaphelenchus mucronatus</i>	w, <i>Pinus pinaster</i>	F2 (Landes- foret de Campet-France INRA)				YES		
<i>Bursaphelenchus mucronatus</i>	w, <i>Pinus densiflora</i>	YACH (1971 Yachiyo, Chiba, Japan)				YES	Irdani T.,2000 Nemat. Med., 28:111-120 <a href="https://www.researchgate.net/profile/Tiziana-Irdani/publications">https://www.researchgate.net/profile/Tiziana-Irdani/publications</a>	
<i>Bursaphelenchus mucronatus</i>	w, <i>Pinus densiflora</i>	UN (Unzen, Nagasaki Japan-Kiyohara T. 1975)						
<i>Bursaphelenchus mucronatus</i>		VR473 (Austria-Osterraich)						
<i>Bursaphelenchus mucronatus</i>	w	C60/11 (Portugal)						
<i>Bursaphelenchus mucronatus</i>	w, <i>Larix sibirica</i> Lebed.	RU-IT1 (Russia)					Ambrogioni et al., Redia 2003 LXXXVI <a href="https://www.researchgate.net/profile/Tiziana-Irdani/publications">https://www.researchgate.net/profile/Tiziana-Irdani/publications</a>	
<i>Bursaphelenchus mucronatus</i> + <i>B. thailandae</i>	w, <i>Larix sibirica</i> Lebed.	RU-DE3 (Russia)					“	

GENOTYPE	Host	ID-Zone	Freezing Date	Freezing Method	Sample Type	DNAs & Analysis	Status/ References	<i>in VIVO</i> cultures
<i>Bursaphelenchus rainulfi</i>	<i>i</i> , <i>Callitris columellaris</i> packaging wood F. Mueller	CH-IT2 (China)				YES	Ambrogioni et al., Redia 2003 LXXXVI; Irdani Redia 2008, XCI pp. 125-128 <a href="https://www.researchgate.net/profile/Tiziana-Irdani/publications">https://www.researchgate.net/profile/Tiziana-Irdani/publications</a>	
<i>Bursaphelenchus sexdentati</i>	<i>w</i> , <i>Pinus halepensis</i>	IT2 (Massa-Tuscany, Italy)				YES	Irdani T.- Nemat. Mediterranea 2000, 28:111-120	
<i>Bursaphelenchus sexdentati</i>	<i>w</i> , <i>Pinus halepensis</i>	IT9 (Piombino-Tuscany, Italy)				YES	Irdani T.- Nemat. Mediterranea 2000, 28:111-120	
<i>Bursaphelenchus sexdentati</i>	<i>w</i> , <i>Pinus pinaster</i>	GR-IT				YES	“	
<i>Bursaphelenchus sexdentati</i>	<i>i</i> , <i>Orthotomicus erosus</i>	IT40	2007	LCTV*	Larvae	YES	Carletti et al., 2008 Redia, XCI p. 67-74 <a href="https://www.researchgate.net/profile/Tiziana-Irdani/publications">https://www.researchgate.net/profile/Tiziana-Irdani/publications</a>	CREA-DC
<i>Bursaphelenchus sexdentati</i>	<i>i</i> , <i>Orthotomicus erosus</i>	IT40	2007	LCTV*	Larvae	YES	Irdani T.- Nemat. Mediterranea 2000, 28:111-120 <a href="https://www.researchgate.net/profile/Tiziana-Irdani/publications">https://www.researchgate.net/profile/Tiziana-Irdani/publications</a>	CREA-DC

GENOTYPE	Host	ID-Zone	Freezing Date	Freezing Method	Sample Type	DNAs & Analysis	Status/ References	<i>in VIVO</i> cultures
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<i>Bursaphelenchus thailandae</i>	w	China-A	2006	LCTV*	Larvae	YES	Irdani T.	CREA-DC
<i>Bursaphelenchus thailandae</i>		RC-A VR448						
<i>Bursaphelenchus thailandae</i>		RC-AT8						
<i>Bursaphelenchus tusciae</i>	w, <i>Pinus pinea</i>	IT14 (Scopeti, Firenze-Italy)				YES	Irdani T., Nemat. Mediterranea 2000, 28:111-120 <a href="https://www.researchgate.net/profile/Tiziana-Irdani/publications">https://www.researchgate.net/profile/Tiziana-Irdani/publications</a> Marinari & Ambrogioni 1998 Nem.Med.26: 243-254	CREA-DC



GENOTYPE	Host	ID-Zone	Freezing Date	Freezing Method	Sample Type	DNAs & Analysis	Status/ References	in VIVO cultures
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<i>Bursaphelenchus xylophilus</i>	w, <i>Pinus sylvestris</i>	US11 (USA, from INRA- P. Abad France 1994)	2006	LCTV*	Larvae	YES	Irdani T. Nemat. Mediterranea 2000, 28:111-120 <a href="https://www.researchgate.net/profile/Tiziana-Irdani/publications">https://www.researchgate.net/profile/Tiziana-Irdani/publications</a>	
<i>Bursaphelenchus xylophilus</i>	w, <i>Pinus densiflora</i>	J3 (Japan, from INRA- P. Abad France 1994)				YES	Irdani T. et al., Redia LXXVIII 1995; Nemat. Mediterranea 2000, 28:111-120 <a href="https://www.researchgate.net/profile/Tiziana-Irdani/publications">https://www.researchgate.net/profile/Tiziana-Irdani/publications</a>	
<i>Bursaphelenchus xylophilus</i>	w, <i>Pinus banksiana</i>	BxAlta (Canada, from INRA- P. Abad France 1994)				YES		
<i>Bursaphelenchus xylophilus</i>	w, <i>Pinus pinaster</i>	(Portogallo)				YES	Mota et al., 1999 Nematology, 1(7), 727-734 <a href="https://doi.org/10.1163/156854199508757">https://doi.org/10.1163/156854199508757</a>	CREA-DC
<i>C. elegans</i> N2		CNR (NA, Campania Italy)	2012	LCTV*	membranes		Irdani T. et al., Cryobiology 2015 <a href="https://www.researchgate.net/profile/Tiziana-Irdani/publications">https://www.researchgate.net/profile/Tiziana-Irdani/publications</a>	CREA-DC On OP50 bacteria culture-plates





GENOTYPE	Host	ID-Zone	Freezing Date	Freezing Method	Sample Type	DNAs & Analysis	Status/ References	in VIVO cultures
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### Cyst-forming nematode

<i>Globodera tabacum tabacum</i>	<i>S. melongena</i> cv. Violetta lunga <i>Nicotiana</i> spp. No attack on <i>S. tuberosum</i>	IT33 Camposano (Napoli, Campania Italy)	2006	LCTV* Irdani et al. 2011 Cryobiology 63 12–16	Larvae	YES	Ambrogioni, L. et al., Nemat. Mediterranea 2000, 28: 49-53 <a href="https://www.researchgate.net/profile/Tiziana-Irdani/publications">https://www.researchgate.net/profile/Tiziana-Irdani/publications</a>	
<i>Globodera tabacum tabacum</i>	<i>S. melongena</i> cv. Violetta lunga <i>Nicotiana</i> spp. No attack on <i>S. tuberosum</i>	IT33 Camposano (NA, Campania Italy)	2006-2007		Larvae Cysts	YES	"	
<i>Heterodera schachtii</i>	<i>Beta vulgaris</i>	IT26 Avezzano (Aquila - Italy)	2007	LCTV* Irdani et al. 2011 Cryobiology 63 12–16	Larvae	YES	Ambrogioni L. & Irdani T., 2001 Nemat. Mediterranea, 29: 159-168 <a href="https://www.researchgate.net/profile/Tiziana-Irdani/publications">https://www.researchgate.net/profile/Tiziana-Irdani/publications</a>	
<i>Heterodera schachtii</i>	<i>Beta vulgaris</i>	IT26 Avezzano (Aquila - Italy)	2008	LCTV*	membranes		"	
<i>Heterodera schachtii</i>	<i>Beta vulgaris</i> (field)	HS 1 Emilia-Romagna Ferrara (Italy)					"	
<i>Heterodera schachtii</i>	<i>Beta vulgaris</i> (field)	HS2Abruzzo Avezzano (Italy)					"	



GENOTYPE	Host	ID-Zone	Freezing Date	Freezing Method	Sample Type	DNAs & Analysis	Status/ References	in VIVO cultures
<i>Heterodera trifolii</i> f. <i>beta</i>	<i>Beta vulgaris</i>	HT1 Piedmont Montagnino S. Michele (AL)				YES	Ambrogioni L. & Irdani T., 2001 Nemat. Mediterranea, 29: 159-168 <a href="https://www.researchgate.net/profile/Tizia-Irdani/publications">https://www.researchgate.net/profile/Tizia-Irdani/publications</a>	
<i>Heterodera trifolii</i>	<i>Dianthus cayophyllus</i> (glasshouse)	HT2 Liguria Sanremo (Italy)				YES	"	
<i>Heterodera trifolii</i>	<i>Dianthus cayophyllus</i> (glasshouse)	HT3 Liguria Riva Ligure (Italy)				YES	"	
<i>Heterodera trifolii</i>	<i>Dianthus cayophyllus</i> (glasshouse)	HT4 Tuscany Castellare di Pescia (Italy)				YES	"	
<i>Heterodera daverti</i>	<i>Dianthus cayophyllus</i> (glasshouse)	HD1 Campania Ercolano (NA-Italy) AZ. Borrelli				YES	"	
<i>Heterodera daverti</i>	<i>Dianthus cayophyllus</i> (glasshouse)	HD2 Campania Ercolano (NA-Italy) AZ. Gentile				YES	"	
<i>Heterodera daverti</i>	<i>Dianthus cayophyllus</i> (glasshouse)	HD3 Campania Torre del Greco (NA-Italy)				YES	"	



GENOTYPE	Host	ID-Zone	Freezing Date	Freezing Method	Sample Type	DNAs & Analysis	Status/References	<i>in VIVO</i> cultures
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## Root-Knot Nematode

<i>Meloidogyne arenaria</i>	<i>Solanum lycopersicum</i>	<b>IT-Perugia (Italy)</b>	2008	LCTV*	Larvae	YES	Caroppo & Irdani T. 1995 Suppl. Nem. Medit. 23, pp. 93-98 <a href="https://www.researchgate.net/profile/Tiziana-Irdani/publications">https://www.researchgate.net/profile/Tiziana-Irdani/publications</a>	
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<i>Meloidogyne incognita</i>	<i>Solanum lycopersicum</i> <i>Nicotiana tabacum</i>	<b>IT30 (Italy)</b>	2007	LCTV*	Larvae	YES	Irdani et al. 2011 Cryobiology 63 12–16 <a href="https://www.researchgate.net/profile/Tiziana-Irdani/publications">https://www.researchgate.net/profile/Tiziana-Irdani/publications</a>	
<i>Meloidogyne incognita</i>	<i>Solanum lycopersicum</i> <i>Nicotiana tabacum</i>	<b>MA1 (Malaysia, Belgium)</b>	2009	LCTV*	Larvae		Irdani T.	



CREA-DC  
On  
Tomato,  
Eggplant,  
Tobacco  
plants  
CREA-DC  
On  
Tobacco  
plants

## *Meloidogyne javanica*

<i>Meloidogyne mali</i> (ex <i>M. ulmi</i> )	<i>Ulmus chenmoui</i> , <i>U. glabra</i>	<b>S.Rossore-Pisa (Toscana, Italy)</b>			deposited CREA-DC USDA (USA) Parasitol. Institute St.Albans U.K.	YES       YES	Marinari Palmisano & Ambrogioni 2000 Nem. Medit. 28:279-293	
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Entomopatogen-nematode

<i>Steinernema carpocapsae</i>	<i>Galleria mellonella</i>	ITS-MR7 (Italy)	2006-2007	Larvae	Irdani et al.,IOBC- WPRS 2005 Bul pp 59- 60 <a href="https://www.researchgate.net/profile/Tiziana-Irdani/publications">https://www.researchgate.net/profile/Tiziana-Irdani/publications</a>
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LEGEND:	light pink - 196°C tube 15 ml	pink -196°C tube 2 ml
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