

Natural Occurrence of Entomopathogenic Nematodes within, and Intraspecific Variation of *Steinernema feltiae* from, an Irish Sand-Dune Habitat

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Introduction

- Previous Sampling of Ireland for Entomopathogenic Nematodes (EPN)
- Sampling of a coastal dune system for EPN
- Molecular Analysis of *Steinernema* spp. from the dune system

Previous Sampling of Ireland for EPN

- Griffin *et al.* (1991) Ireland:
 - *Steinernema feltiae* (7.1 % prevalence),
 - *S. affine* (3.3 %)
 - *Heterorhabditis downesi* (previously *Heterorhabditis* ‘Irish Type’; one coastal sample).
- Griffin *et al.* (1994) Ireland and UK:
 - *H. downesi* (10.7 %)
 - »All positive sites were coastal.



Bull Island

- Consolidated sand bar
 - Bull Wall
 - Golf Links (93 ha)
 - Saltmarsh (70 ha)
 - Dune Grassland (75 ha)



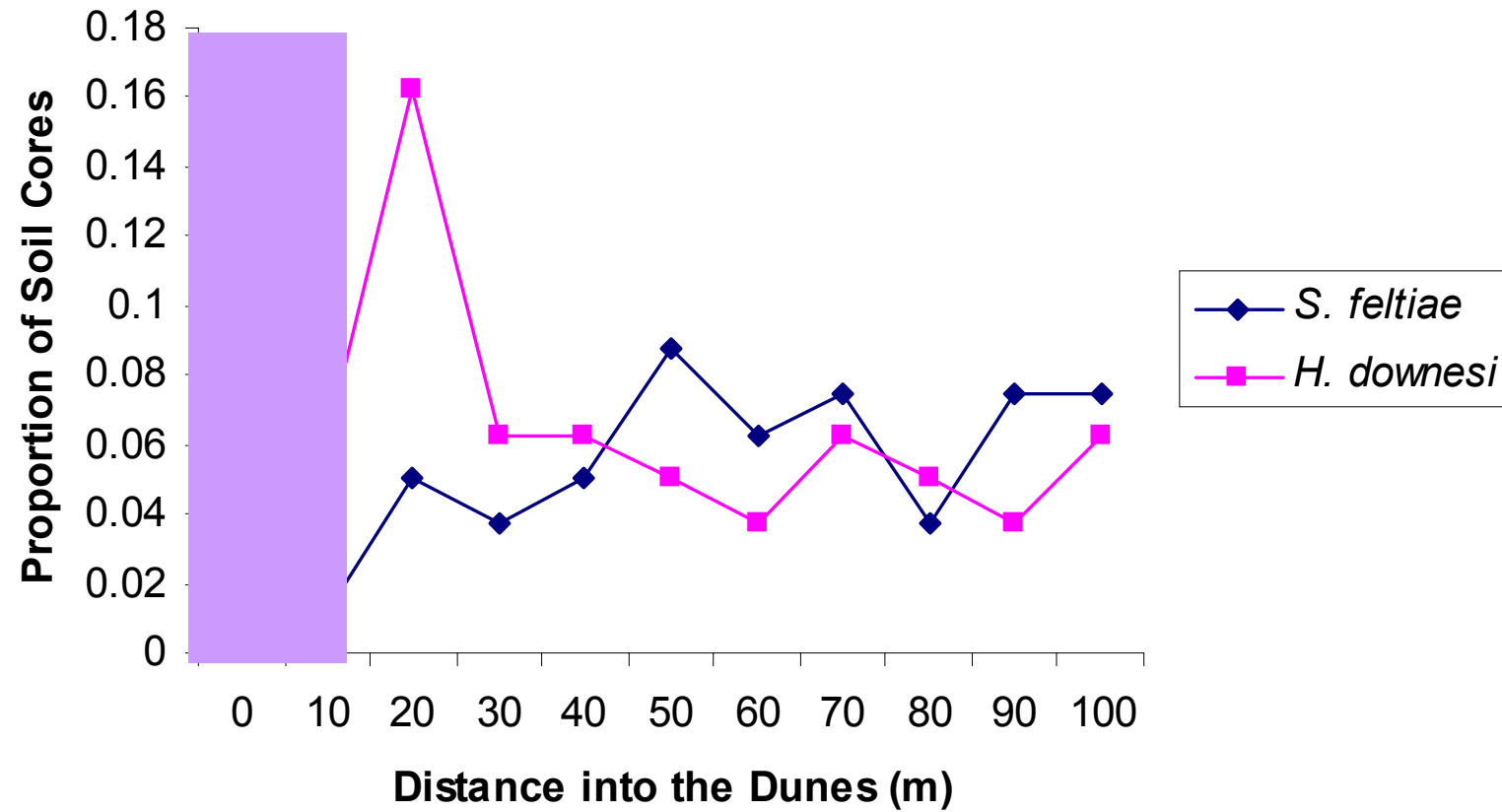
Sampling Method



- July and August 2001 and 2002
- Cores 10 x 10 x 15 mm
- 10 m intervals
(100 x 800 m grid)
- Baited twice with *Galleria mellonella*



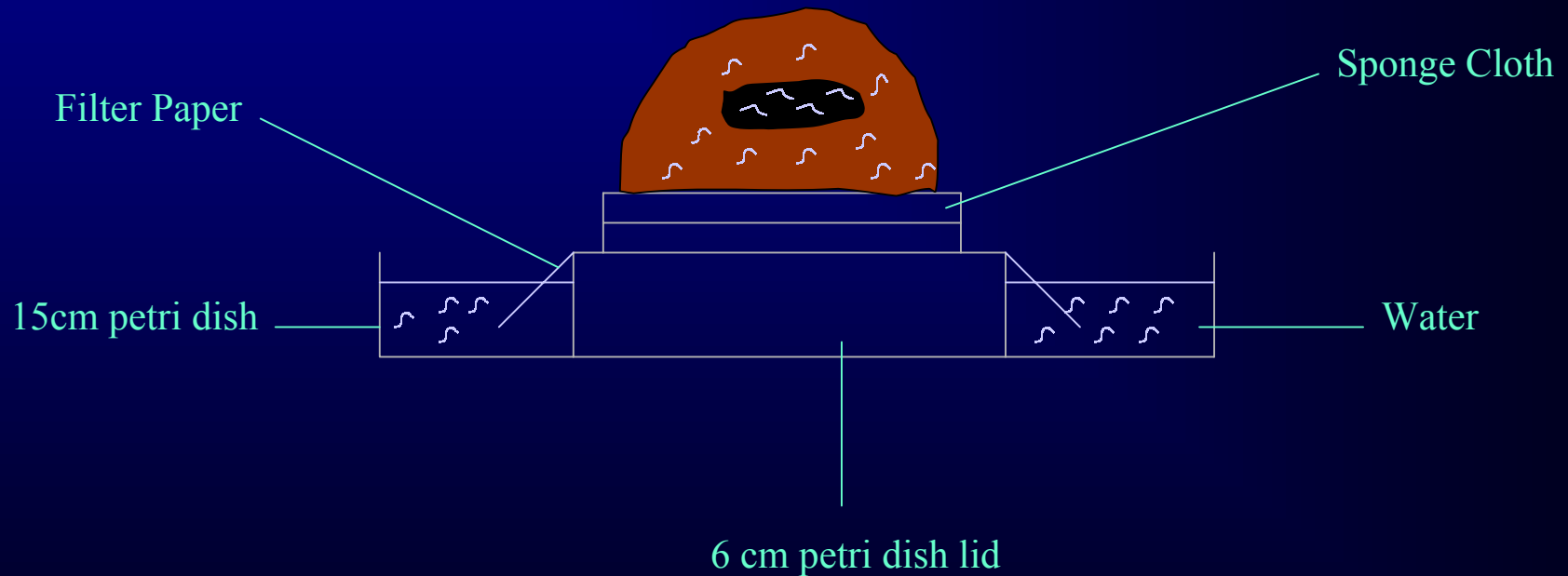
2001 and 2002 Combined



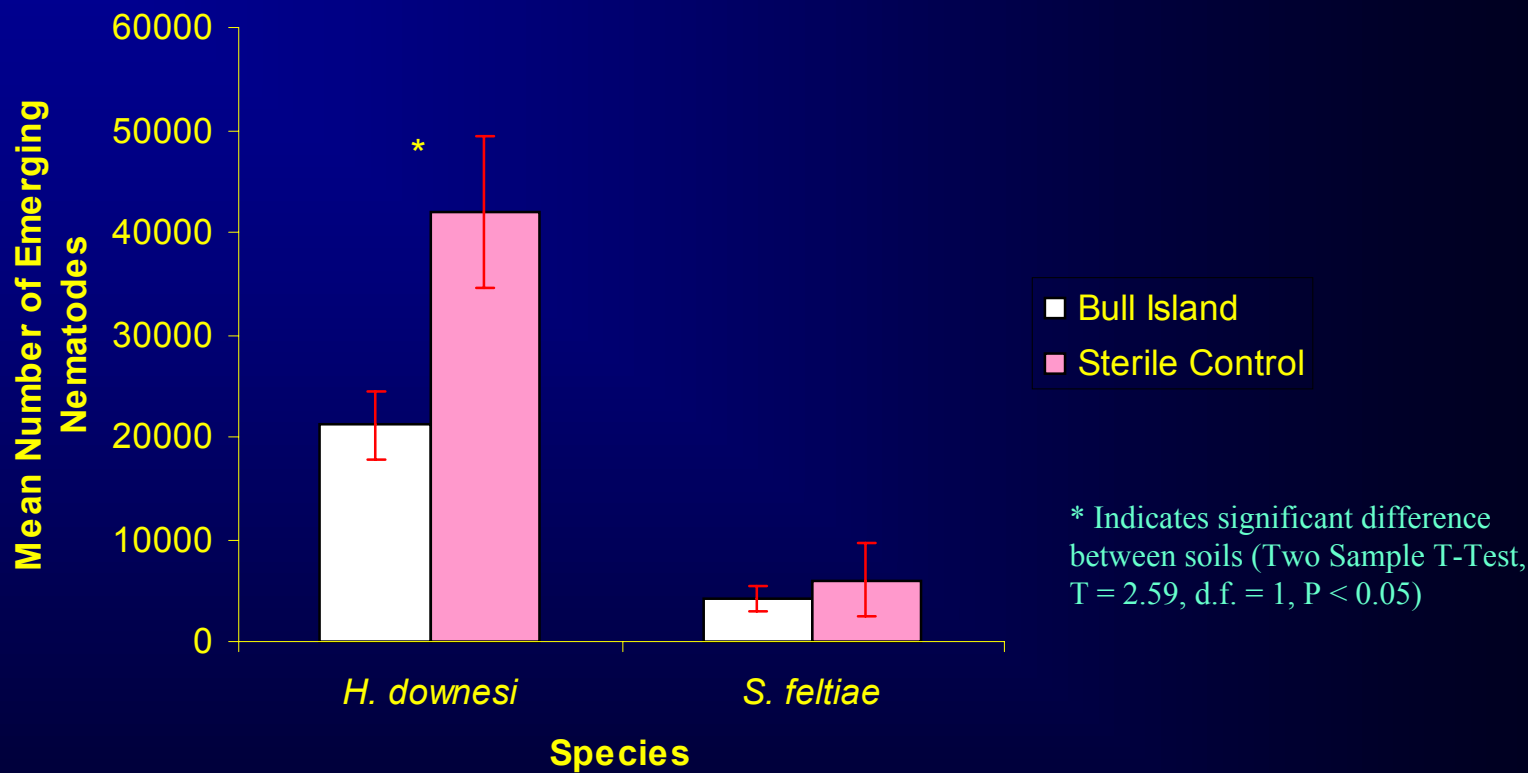
Factors Potentially Influencing Distribution of EPN Populations on Bull Island

- Host Insect Distribution
 - Dipteran and Coleopteran larvae
- Environmental Factors
 - Salinity, Moisture, Dessication
- Biotic Factors
 - Predators, e.g. mites, nematodes, fungi

Assessing Biotic Impact on EPN Populations



Biotic Factors Influencing EPN Populations



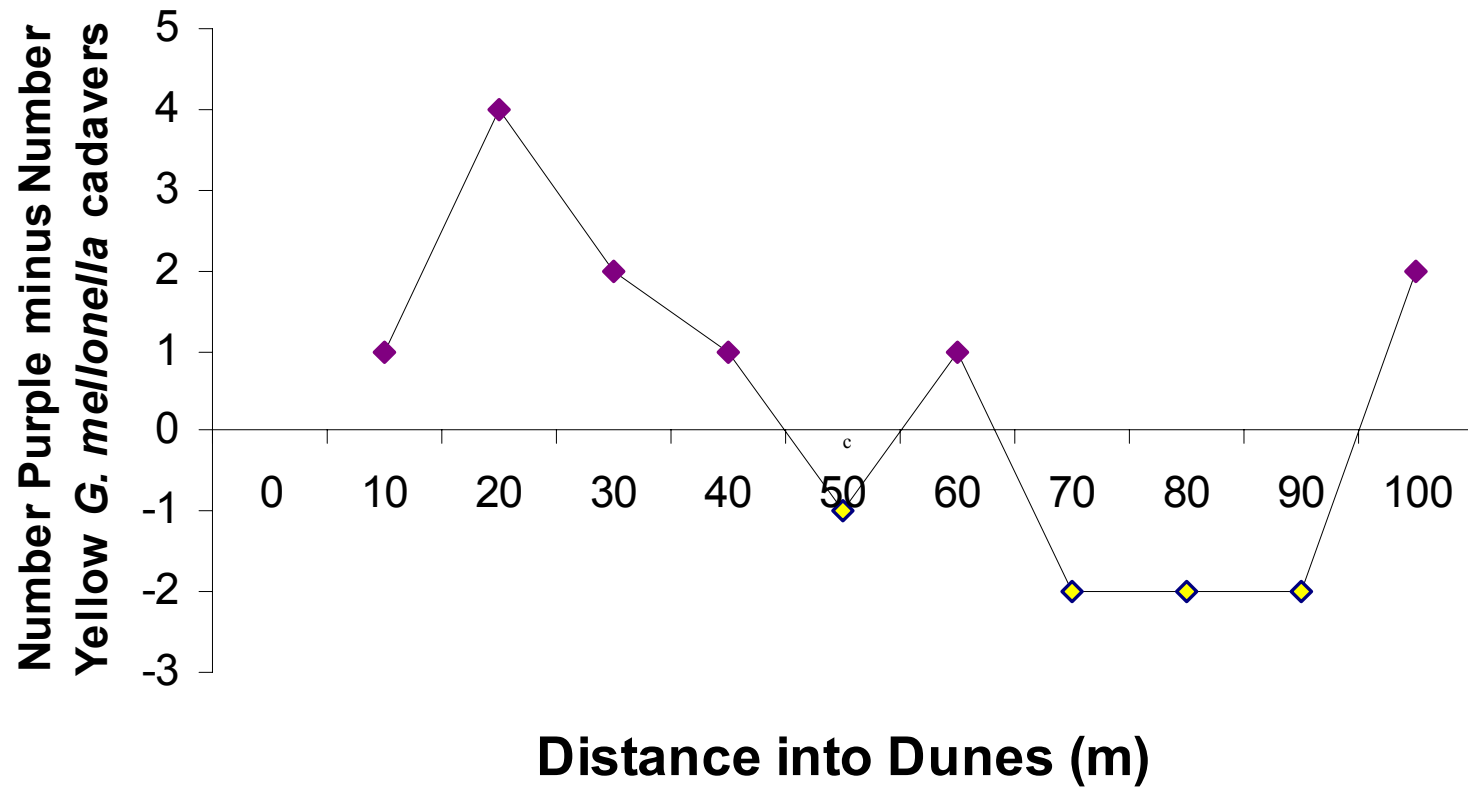
- Significantly more *H. downesi* cadavers exhibited emergence than *S. feltiae* ($\chi^2 = 7.21$, $P < 0.05$).
 - *H. downesi* cadavers less susceptible to waterlogging?

Colour Phenotypes of *H. downesi* Cadavers

- Two colour phenotypes: Purple and Yellow
- Intimately associated on Bull Island

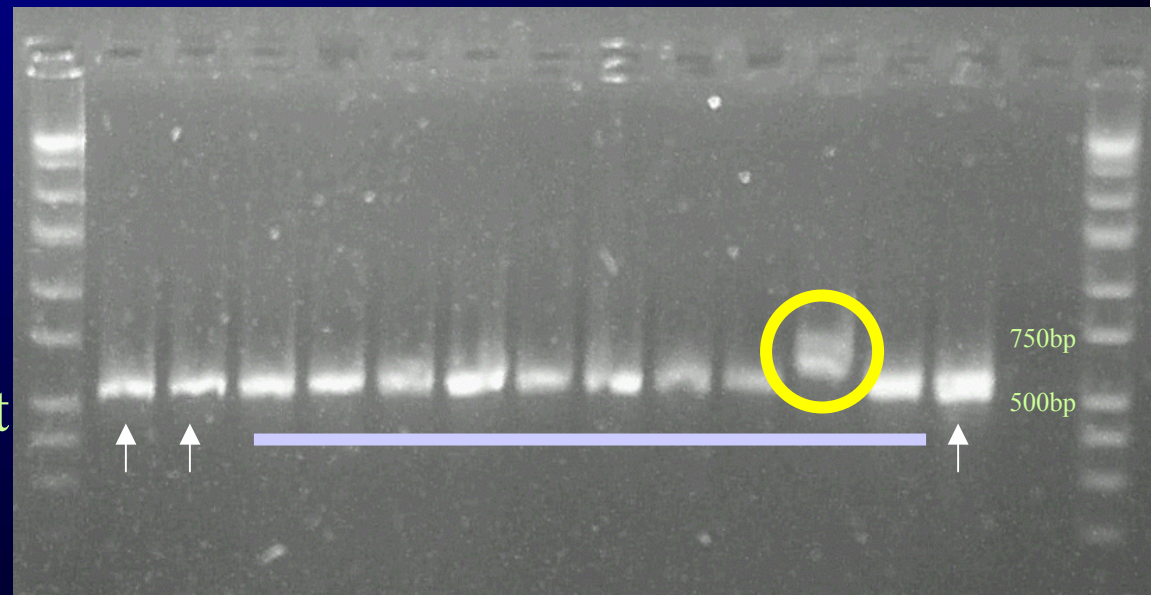


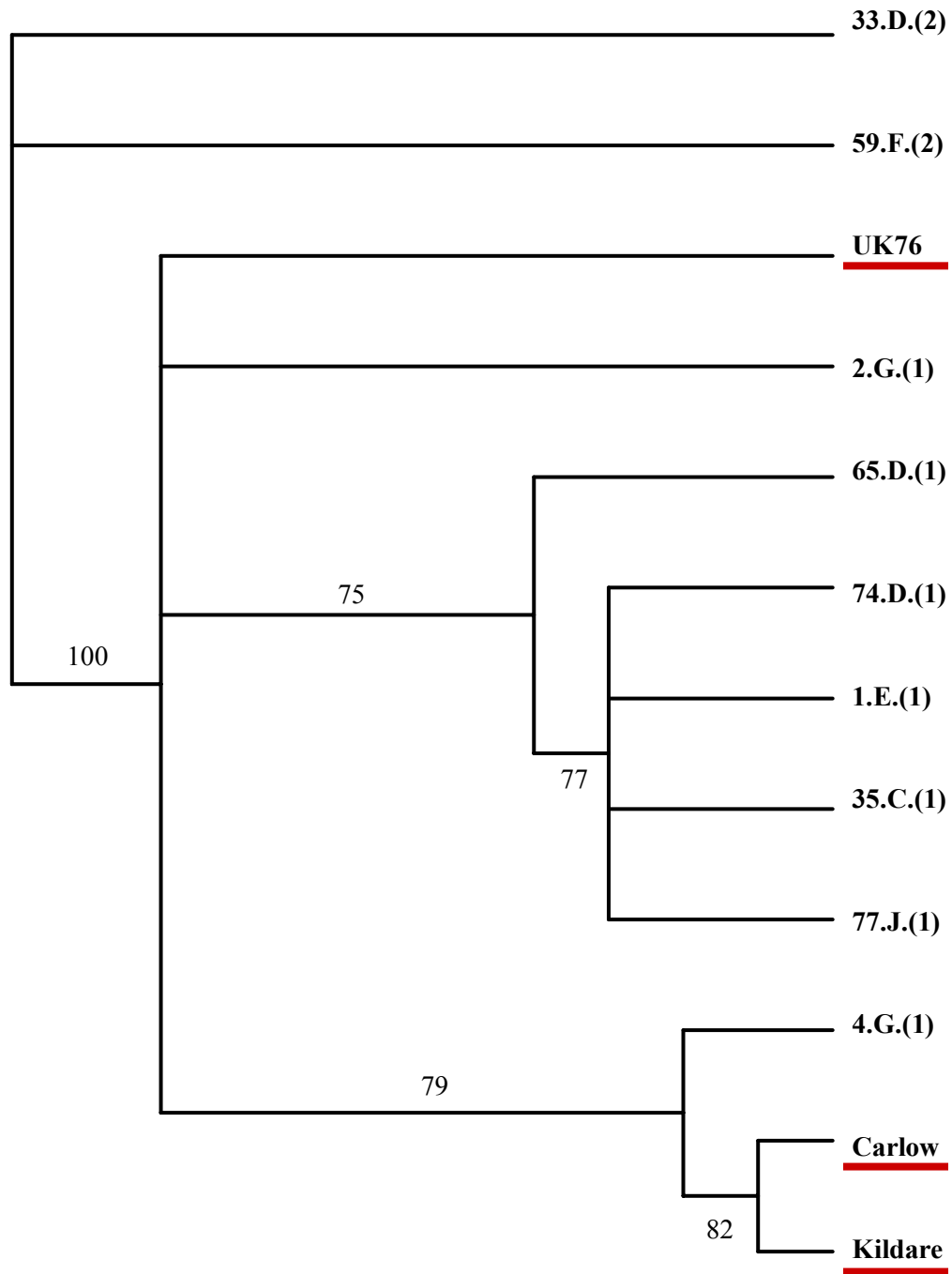
2001 and 2002 combined

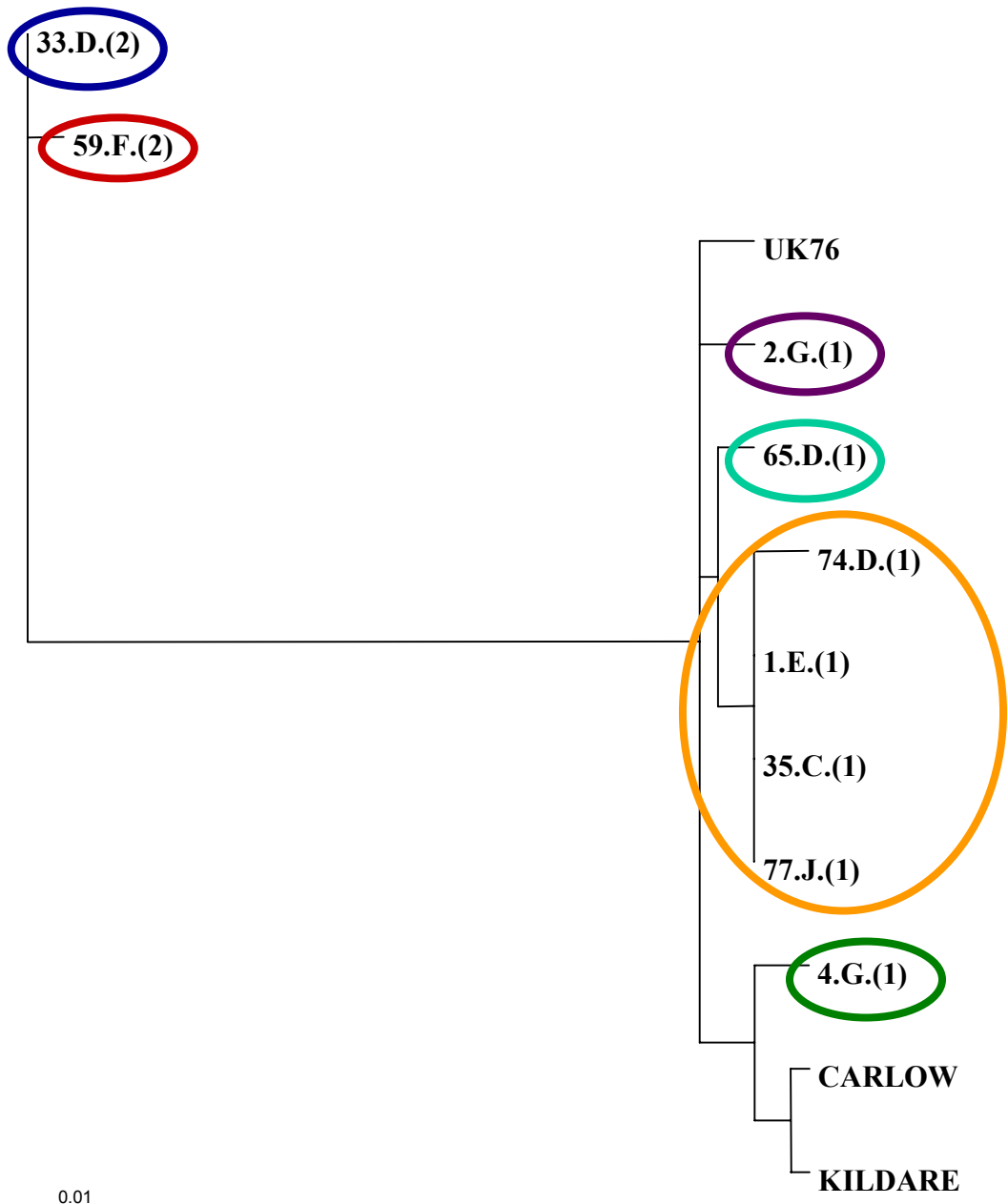


Molecular analysis of *S. feltiae* populations

- Exon Primed, Intron Crossing PCR
- Beta tubulin gene
- Isolation of DNA
 - 10 Bull Island, 3 outgroups
- Electrophoresis of PCR product on agarose gel
- Cloning of PCR product
- Sequences aligned in CLUSTAL X
- Maximum Likelihood







Future Work

- Sequence other parts of the genome
- RFLP of *S. feltiae* – A2 Variant?
- *Heterorhabditis downesi*?
- Clontarf coastline
- AFLP

Acknowledgements

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