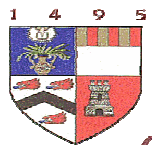


Horizontal dispersal of entomopathogenic nematodes through sand, peat & chipped bark

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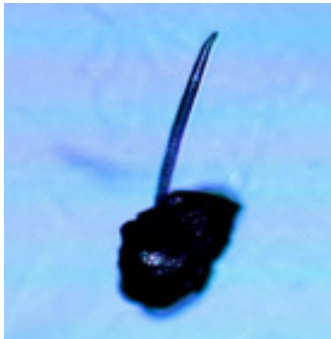
The Research Agency of the Forestry Commission

Introduction

Foraging strategies:

Ambusher

(*Steinernema carpocapsae*)



Intermediate

(*Steinernema feltiae*)



Cruiser

(*Heterorhabditis megidis*)



Aim:

- To investigate the comparative horizontal dispersal of *H. megidis*, *S. feltiae* & *S. carpocapsae* in response to the wax moth, *Galleria mellonella* through sand, peat & chipped bark.



Large Pine Weevil
(*Hylobius abietis*)



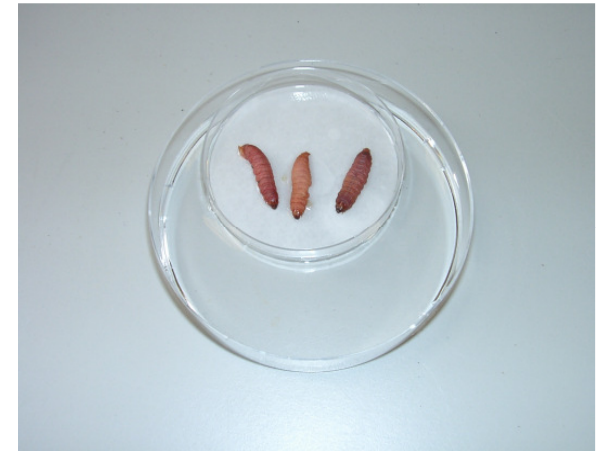






Materials & Methods

- **Infective juveniles; *S. feltiae*, *H. megidis*, *S. carpocapsae* reared *in vivo*.**

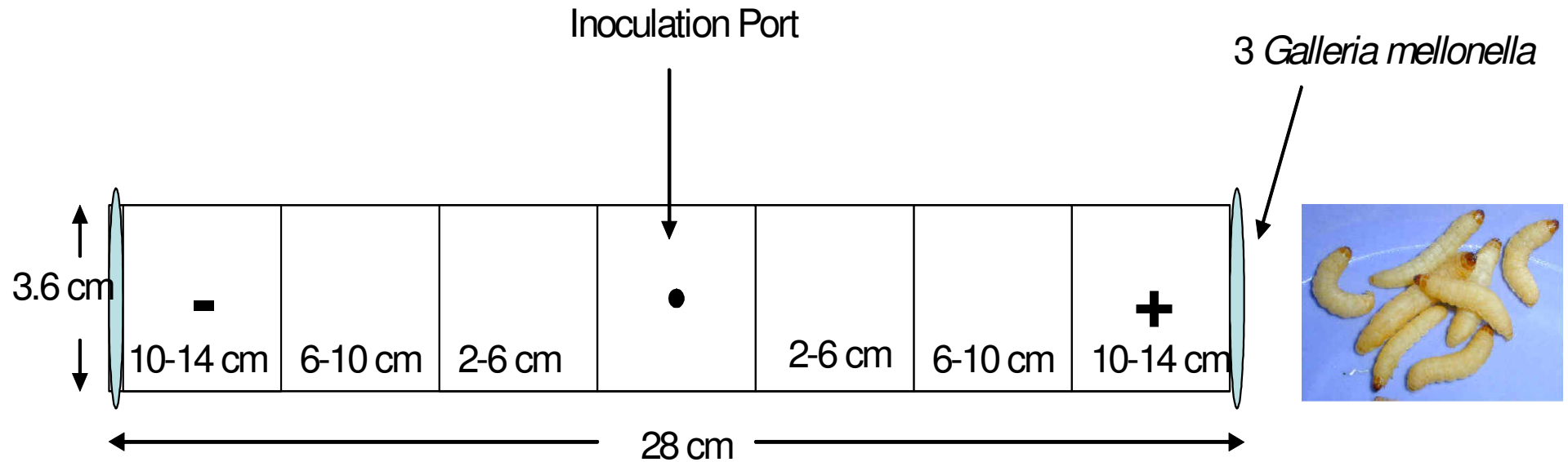


- **Media -**



- **Wet bulk density (Y_t) & matric water potential (Ψ_m) analysed.**

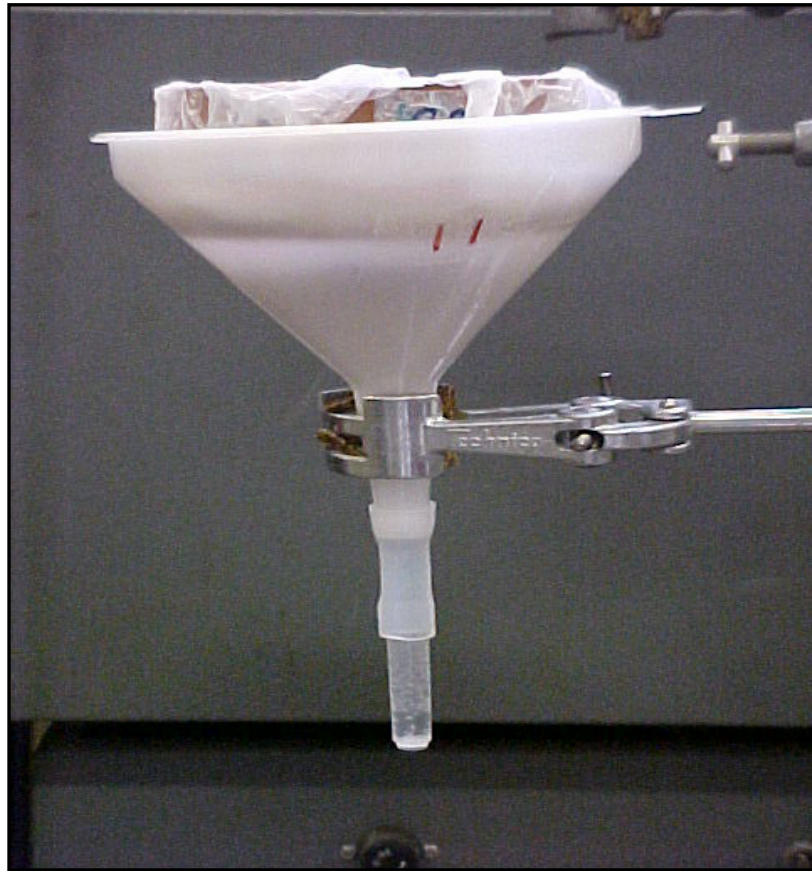
Test chamber



8 replicates for each treatment (3 species x 3 media).

- Mean wet bulk density - 1.34 g/cm³ for sand, 0.30 g/cm³ for peat and 0.24 g/cm³ for chipped bark.
- Controls – test chambers with no stimulus (*G.mellonella*).
- Covered by black bag & left for 72 hours.
- Experiments conducted at an ambient temperature of 20 ± 2°C.

Extraction & quantification of nematodes from samples



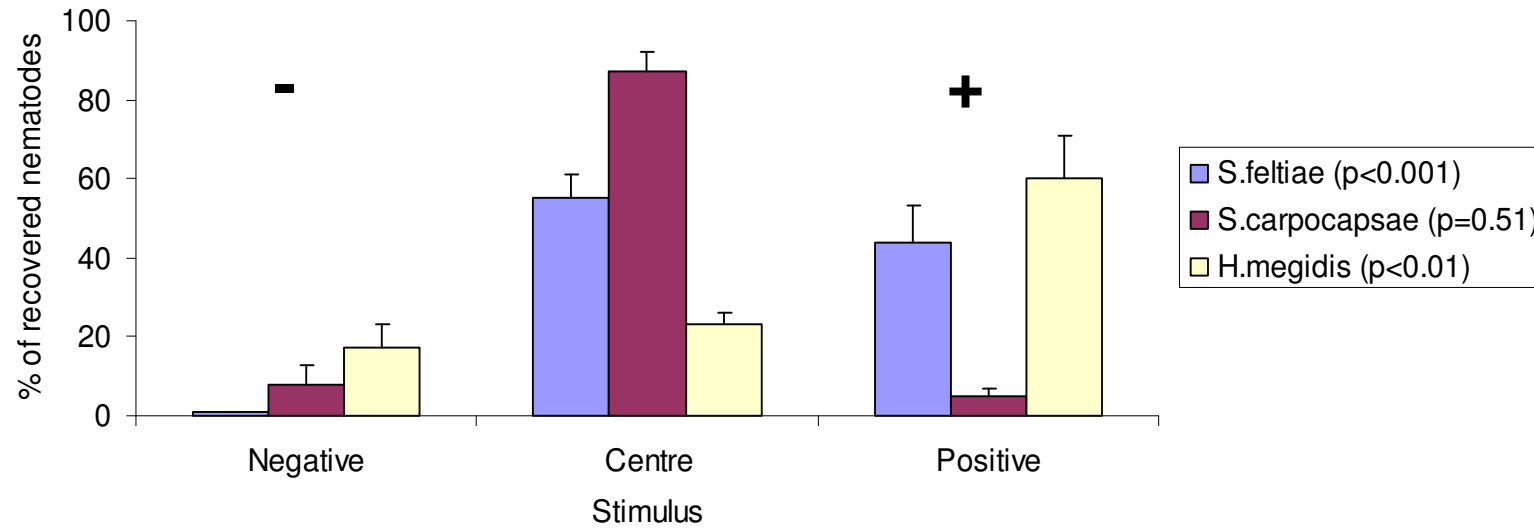
- Samples taken from all seven compartments & numbers assessed.
- Baermann funnels (left for 48 hours) used to extract the nematodes from each sample.

Statistical analysis

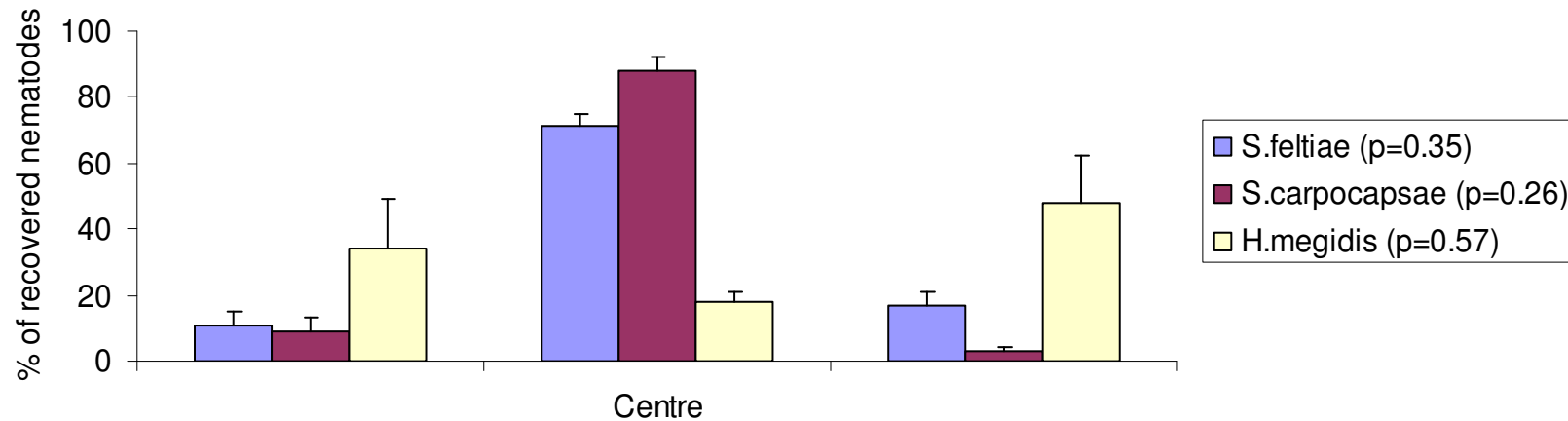
- Data expressed as % of recovered nematodes in each of positive & negative (no stimulus) sections of the test chambers.
- % data transformed by arcsine transformation.
- ANOVA, paired & unpaired t-test.
- Pearson correlation analysis.

Results

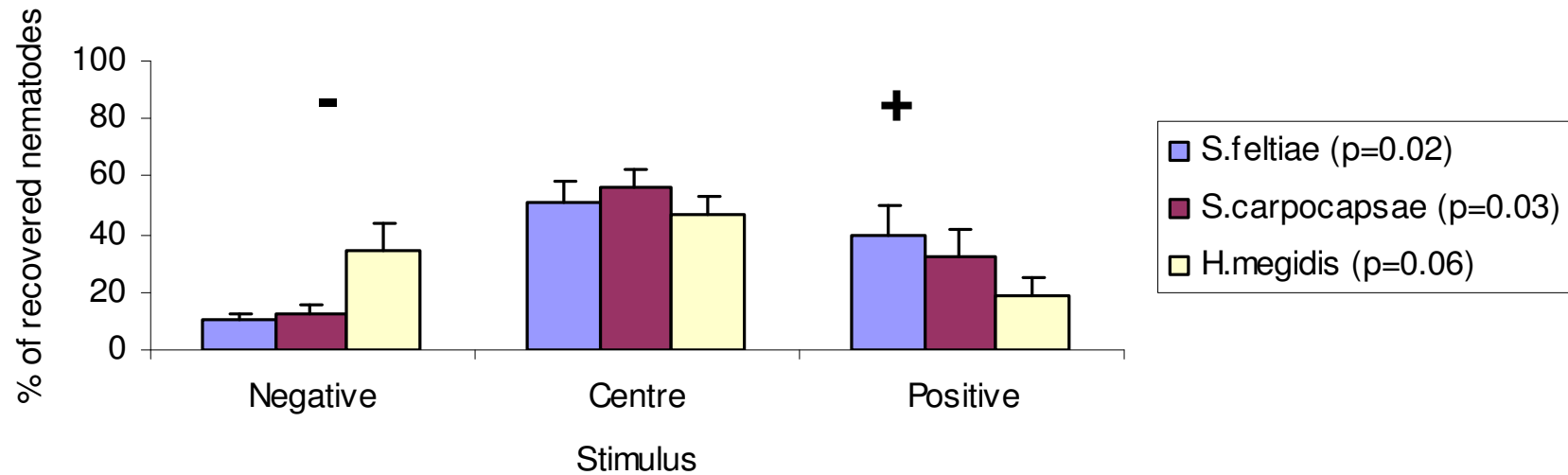
Response through sand



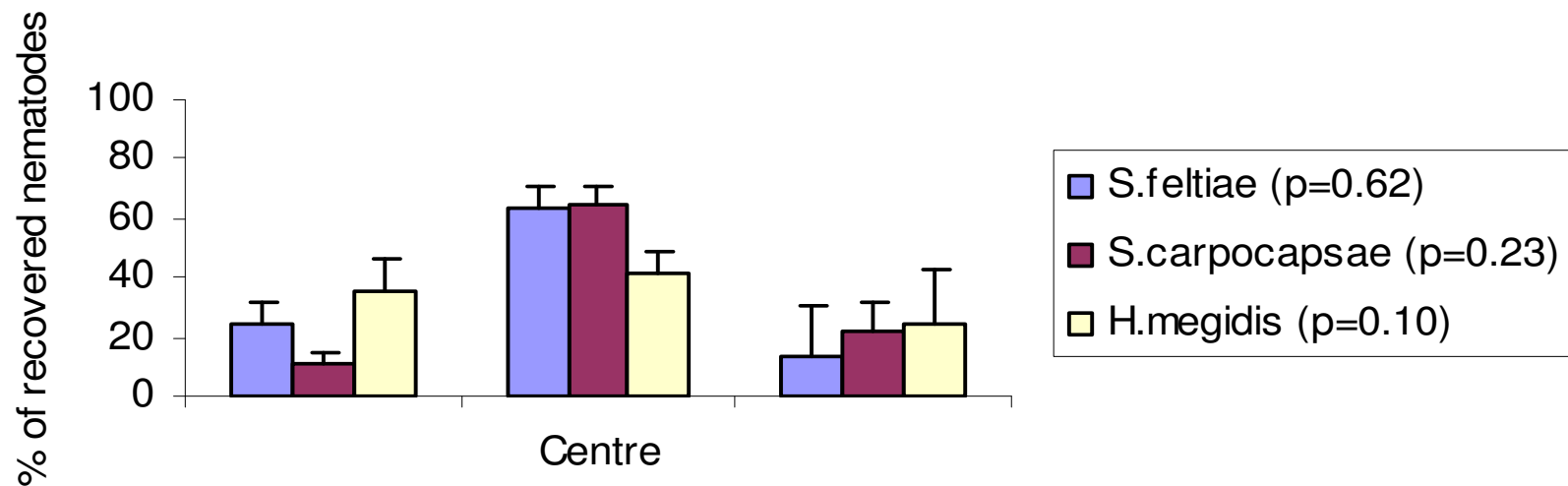
CONTROL



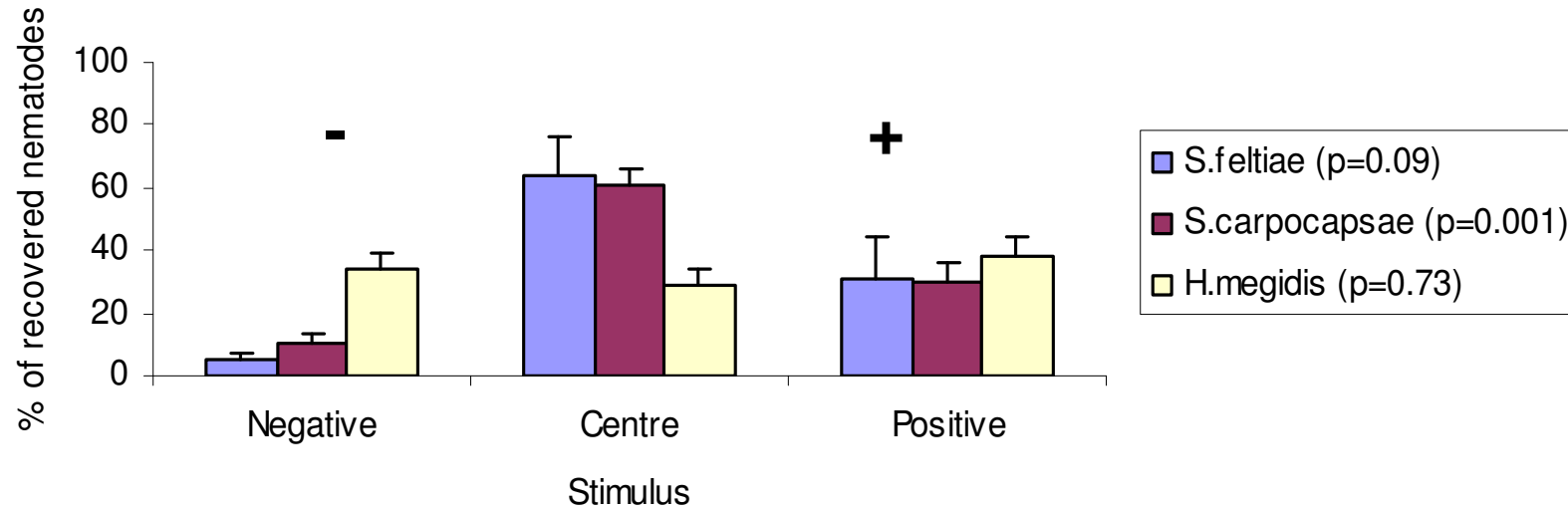
Response through chipped bark



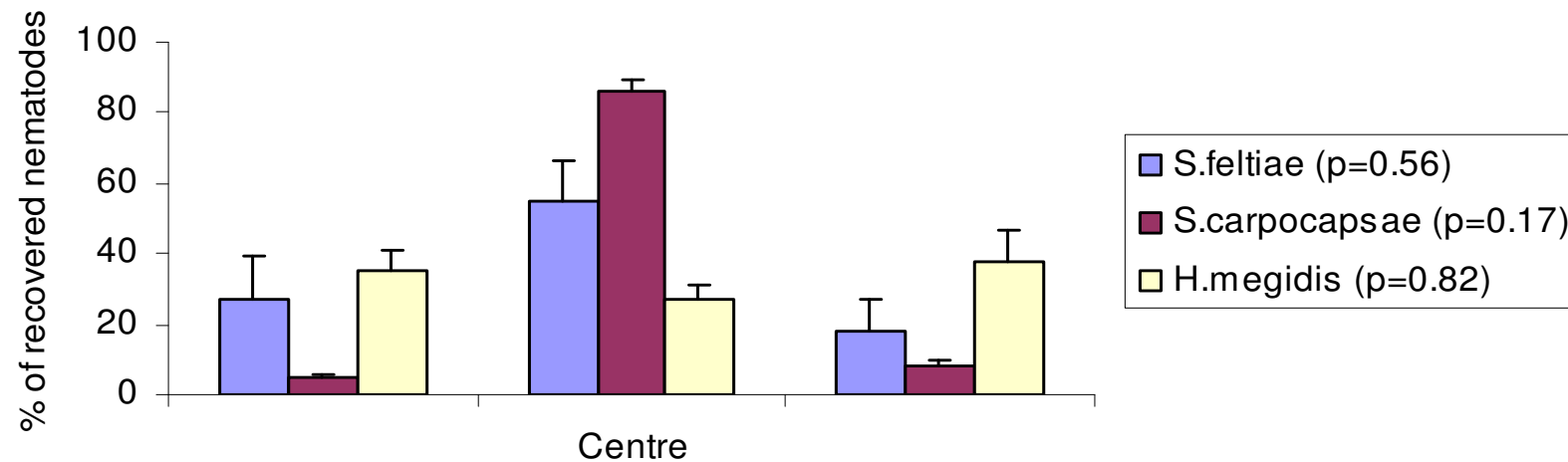
CONTROL



Response through peat



CONTROL



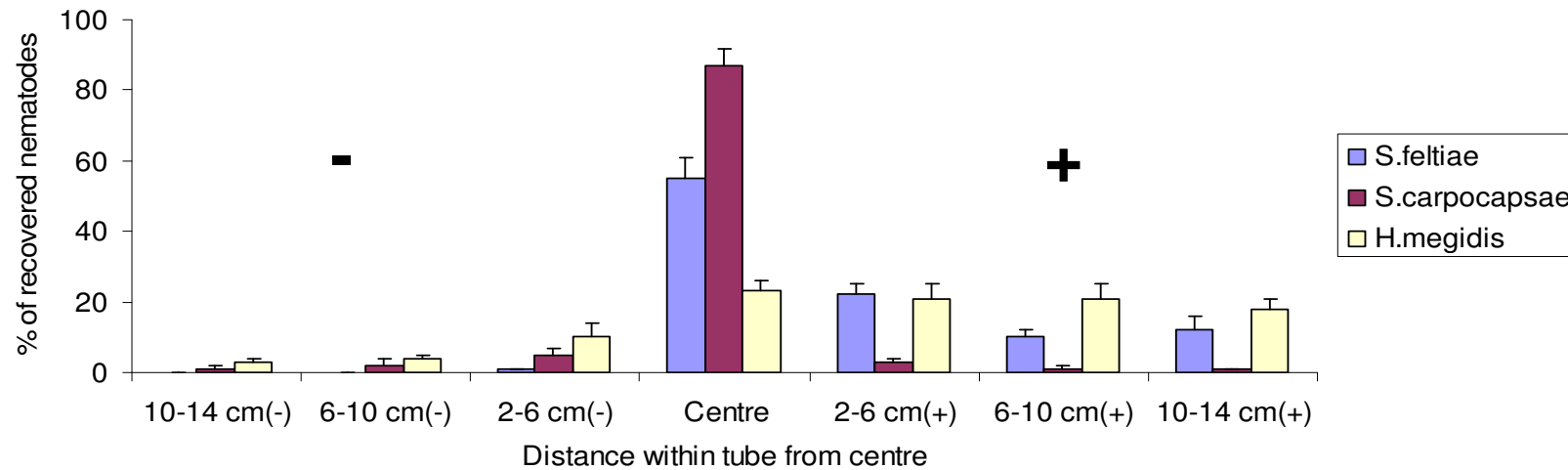
In summary:

	<i>S. carpocapae</i> (Ambusher)	<i>S. feltiae</i> (Intermediate)	<i>H. Megidis</i> (Cruiser)
Sand		Sig. taxes	Sig. taxes
Bark	Sig. taxes	Sig. taxes	
Peat	Sig. taxes		

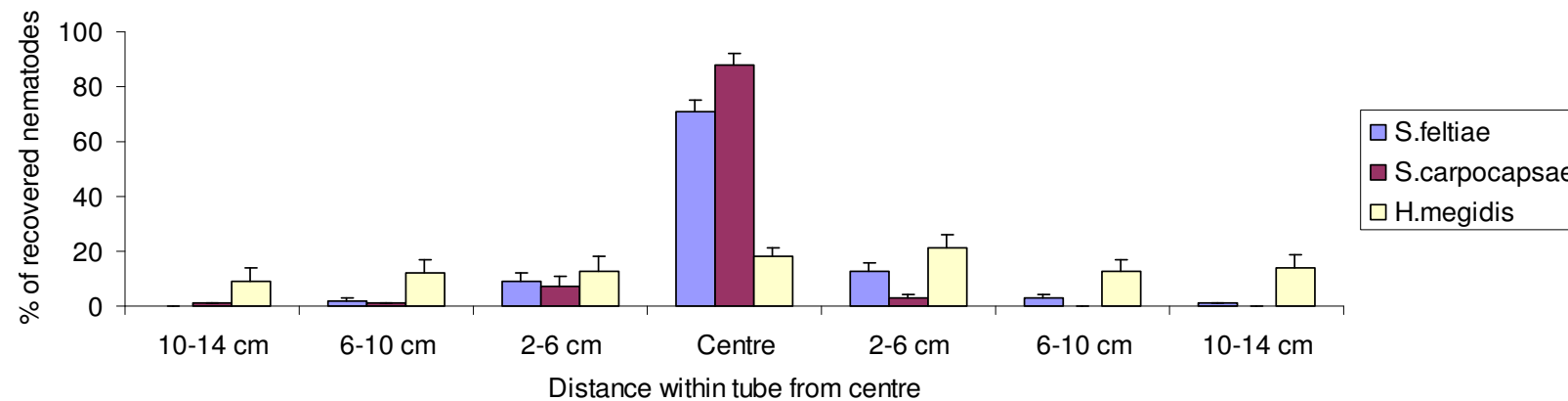
Mobility differences amongst species



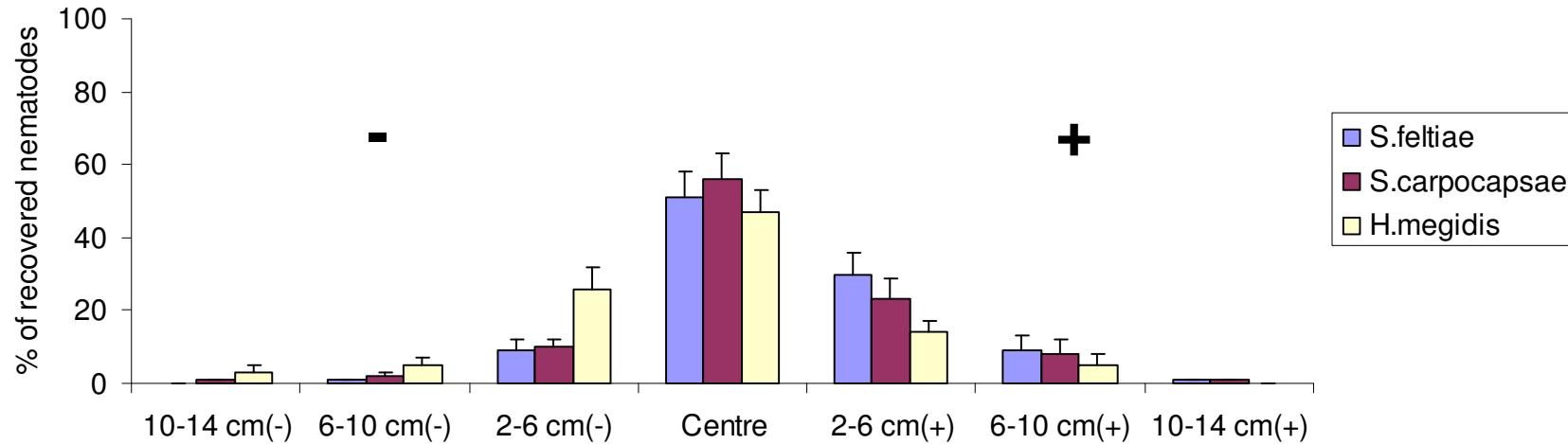
Movement through sand



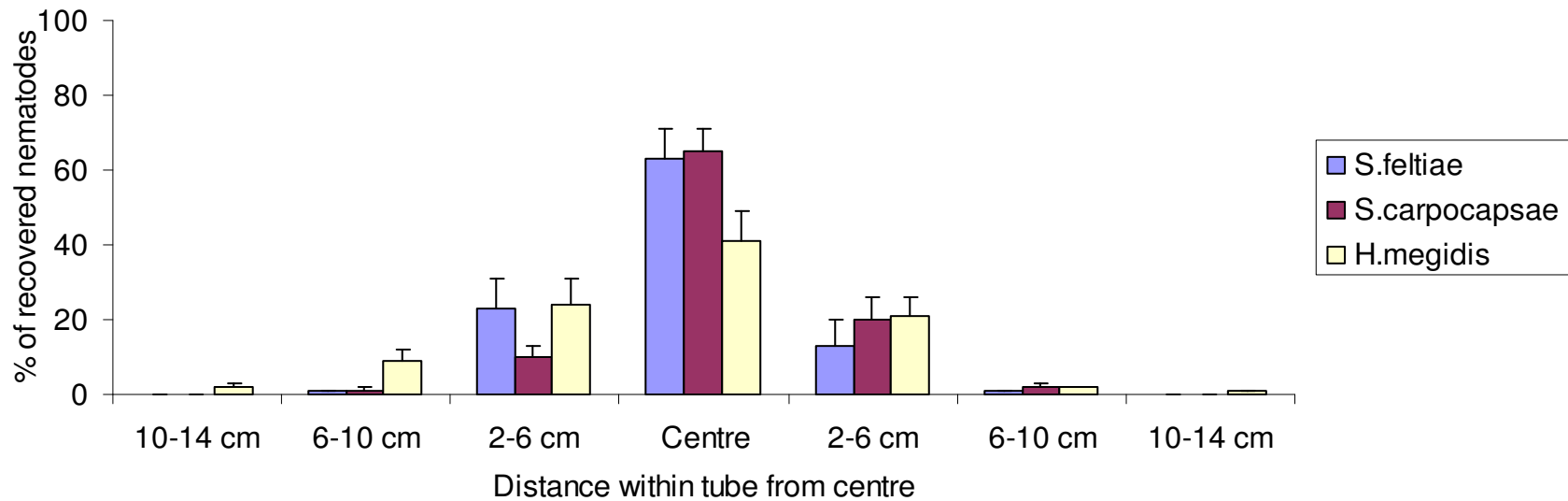
Control



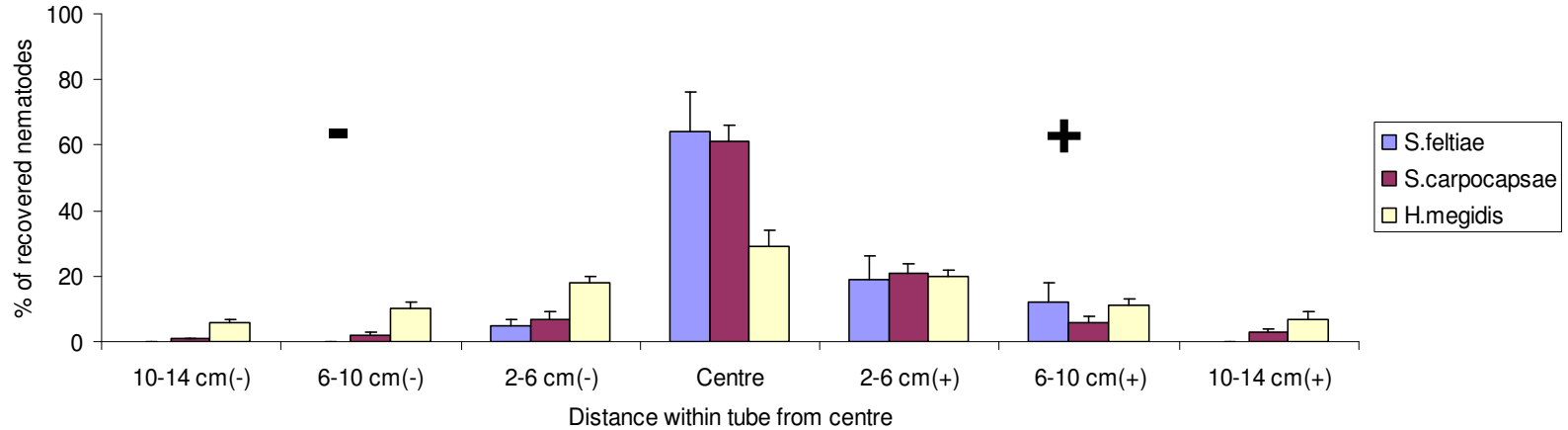
Movement through bark



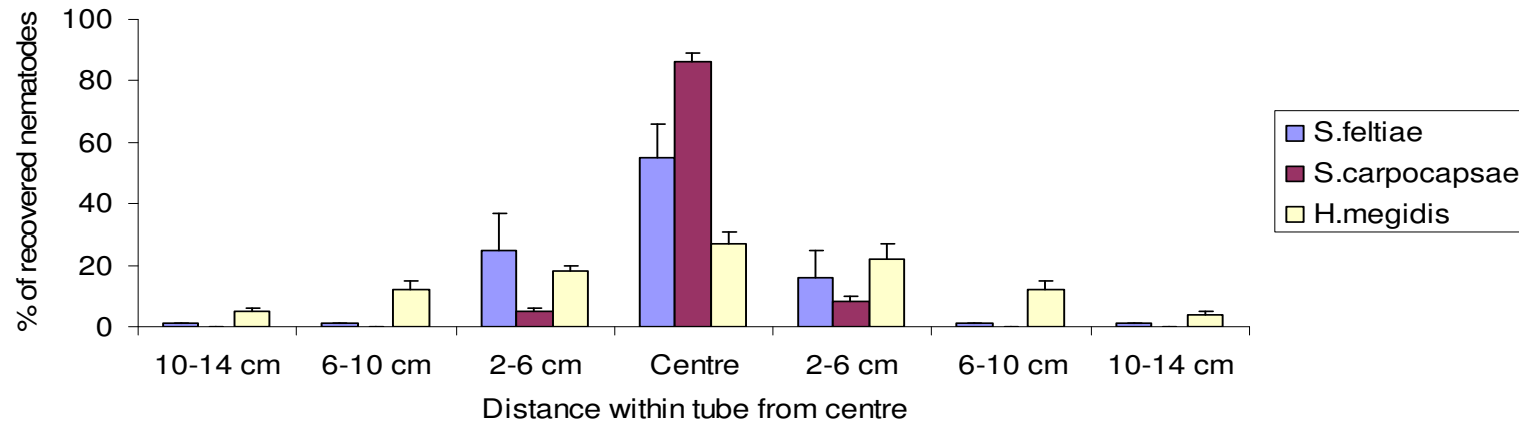
Control



Movement through peat



Control



Conclusion

- Movement and response of species towards insect hosts is dependant on the substrate.
- Some species moved more in one substrate compared to another.
- In bark, *S. carpocapsae* moved just as readily as *H. megidis* and *S. feltiae*, regardless of foraging strategy.
- Movement of EPNs depends not only on the species but also on the characteristics of the substrate.

Acknowledgments



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Stuart Heritage

Hugh Mckay





Questions?