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# BURROWING IN CAPTIVE DESERTAS WOLF SPIDERS (*HOGNA INGENS*)



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**ZSL**  
LET'S WORK  
FOR WILDLIFE

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4 Zoological Society of London

# THE DESERTAS WOLF SPIDER

- Critically Endangered
- Understudied
- Strict endemic to Vale de Castanheira, Desertas Grande, Madeira, Portugal.



- Relies on biotope  
– protect  
– Protecti  
weathe  
– Sit-and-



# CONSERVATION RESEARCH

- Invasive grass species, *Phalaris aquatica*
  - negative impact on presence and abundance of *H. ingens*.
  - roots prevent access to the microhabitats below rocks, critical for burrowing.
- *Ex-situ* conservation scheme following successful breeding of over 1000 individuals at Bristol Zoological Society.



**Aim:** To investigate burrowing behaviour in order to inform conservation efforts and captive husbandry.

# BRISTOL AIMS



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- Substrate preferences for burrows
- Effect of anchor point presence/size on burrows
- Other information
  - growth and moult rates
  - enclosure usage and behaviour



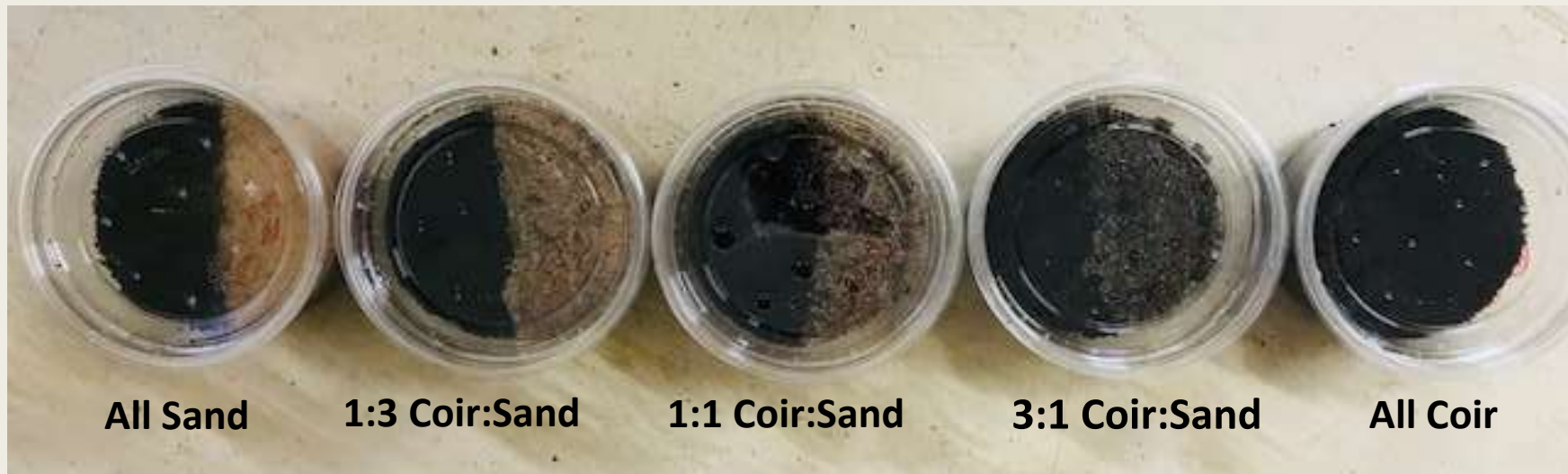
# BRISTOL METHODS



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## Substrate Preferences

- 5 conditions;  $n=12$  in each.
- Kept individually.
- Choice of burrowing in coir or in varying ratios of sand:coir substrate.
- Effect of substrate type on promotion of burrow building.
- Choice between substrates investigated.



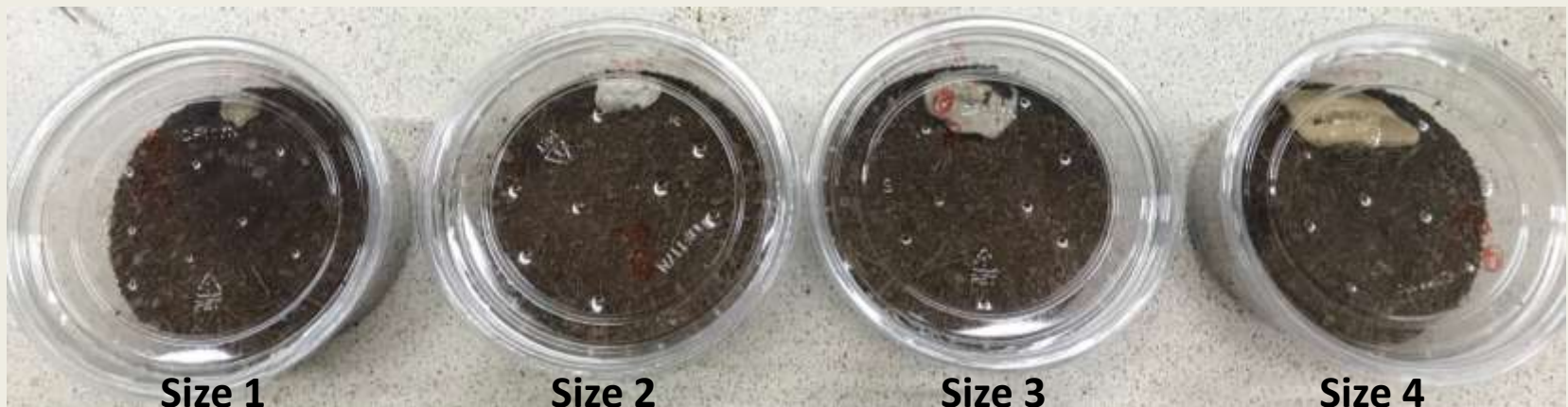
# BRISTOL METHODS



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## Anchor Points

- 5 conditions.  $n=12$  in each.
- Kept individually.
- ‘No Rock’ and rocks ranging in largest diameter from 1-4cm.
- Coir used as substrate
- Effect of rock on frequency of burrowing
- Relationship between rock size and burrow adjacency analyzed – Binomial GLM.



# BRISTOL RESULTS: substrate preferences

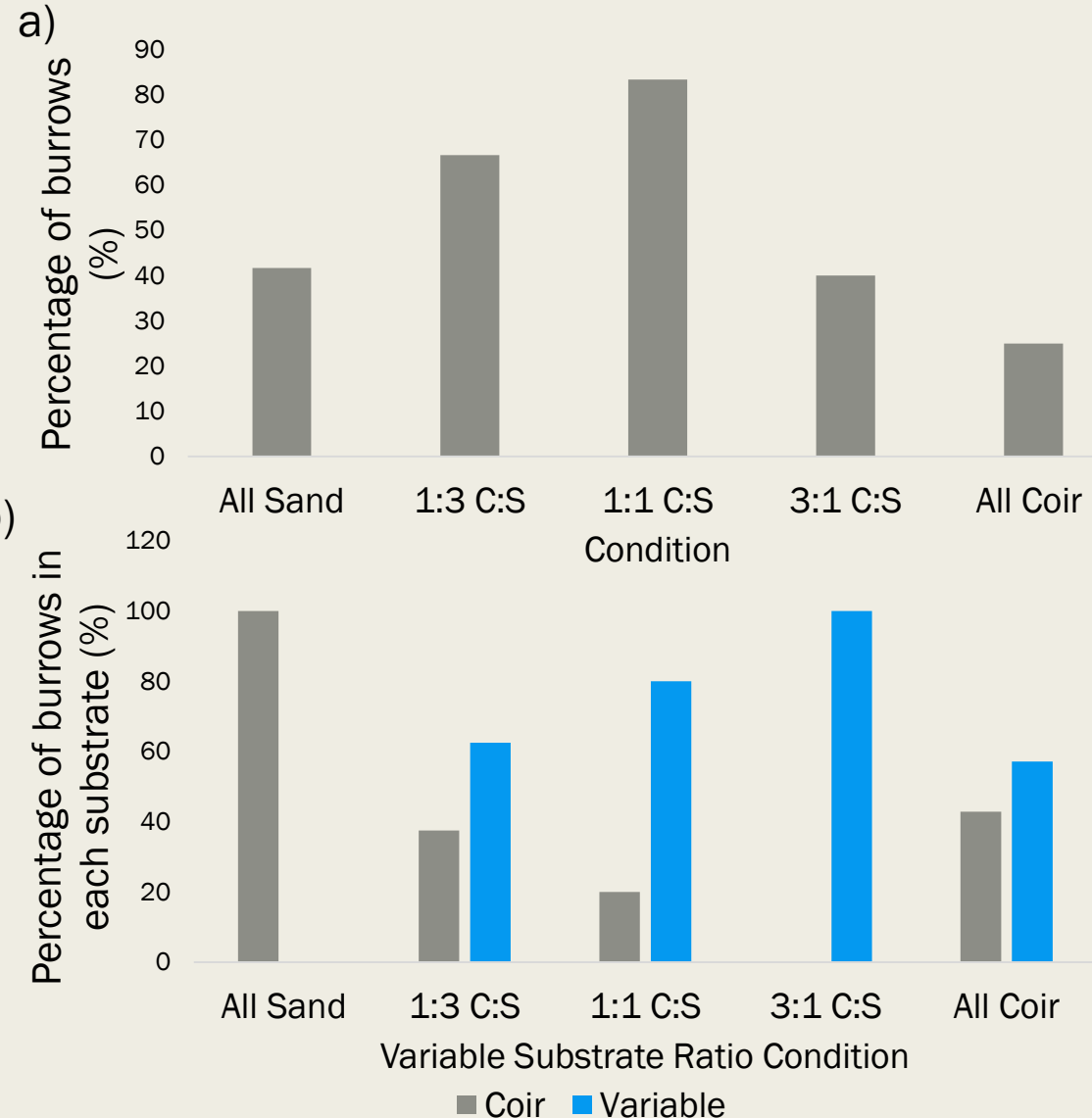


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Mixes of substrates were preferred to 'All Sand' and 'All Coir' conditions (Fisher's Exact;  $p < 0.05$ ).

a) Percentage of spiderlings in each soil condition that built a burrow.

b) Percentage of burrows made in the coir side or the variable side.



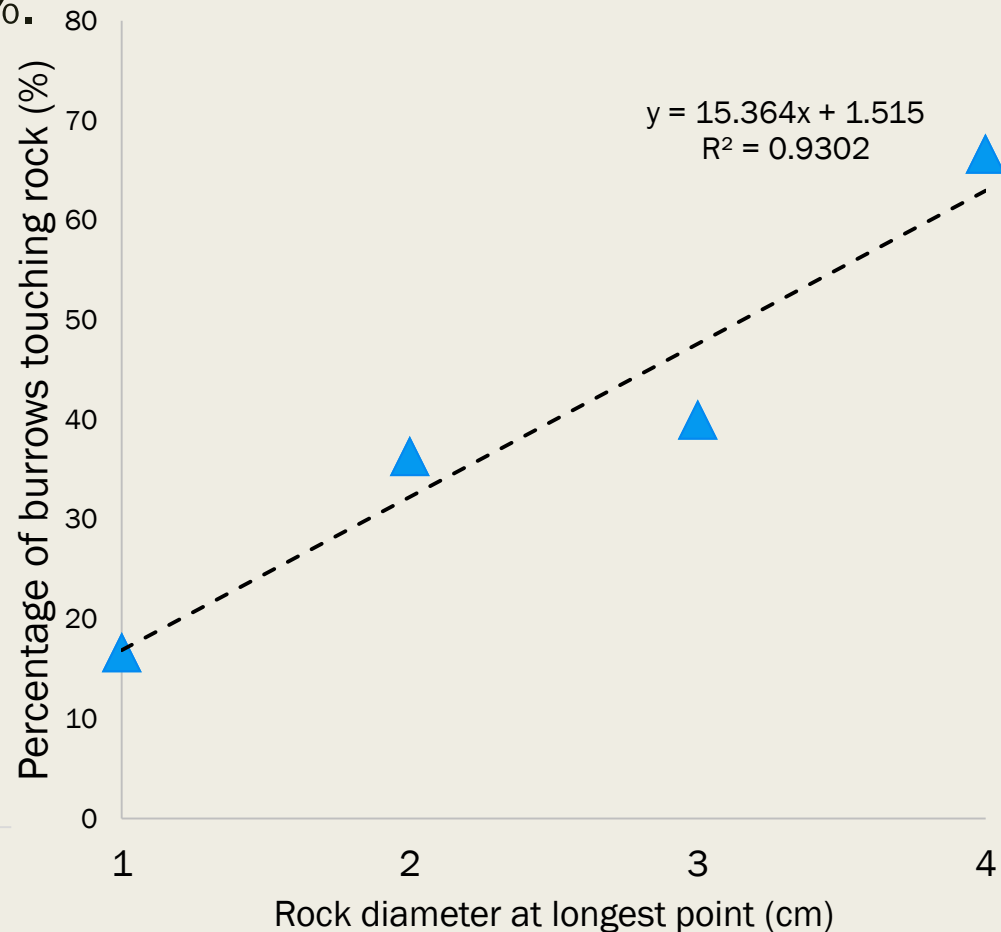
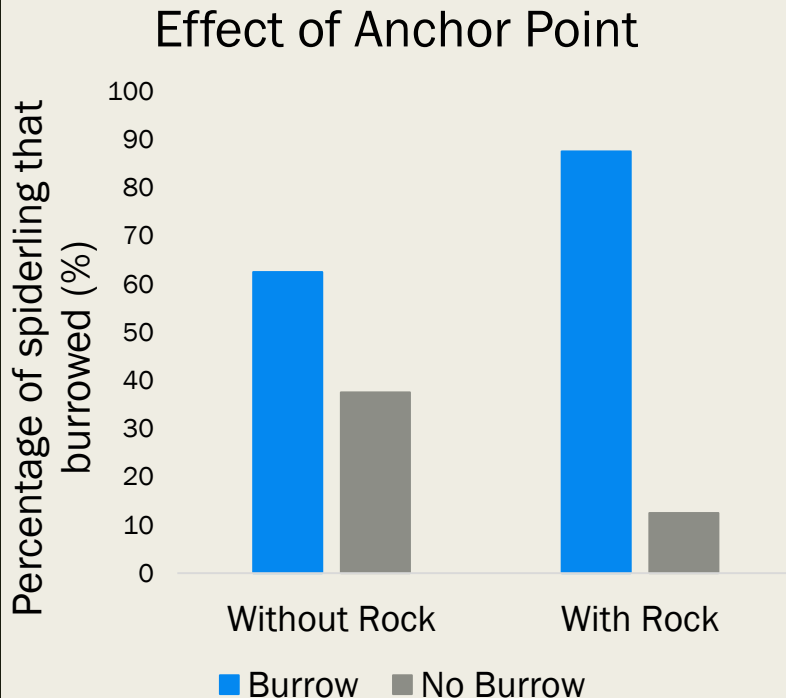
# BRISTOL RESULTS: Anchor Points



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Presence of rocks increased frequency of burrowing by 40%. More burrows were built touching larger rocks ( $R^2 = 0.93$ ).

## Effect of Rock Size





# ZSL AIMS

- 1) Investigate the effect of substrate depth on burrowing behaviour
  - *Size of burrows produced.*
  - *Number of burrows produced.*
- 2) Investigating the effect of substrate type on burrowing behaviour.



# ZSL METHODOLOGIES

n=25

Group	Substrate depth (cm)	Substrate type
1	1.5	Coco coir
2	2	Sand
3	3	Coco coir: sand mix
4	4	Leaf litter
5	5	Chalk

- Callipers used to measure burrow dimensions.
- Numbers of burrows made recorded.
- Transferred to larger tubs as standard husbandry.



# ZSL RESULTS

## Substrate depth – burrow size:

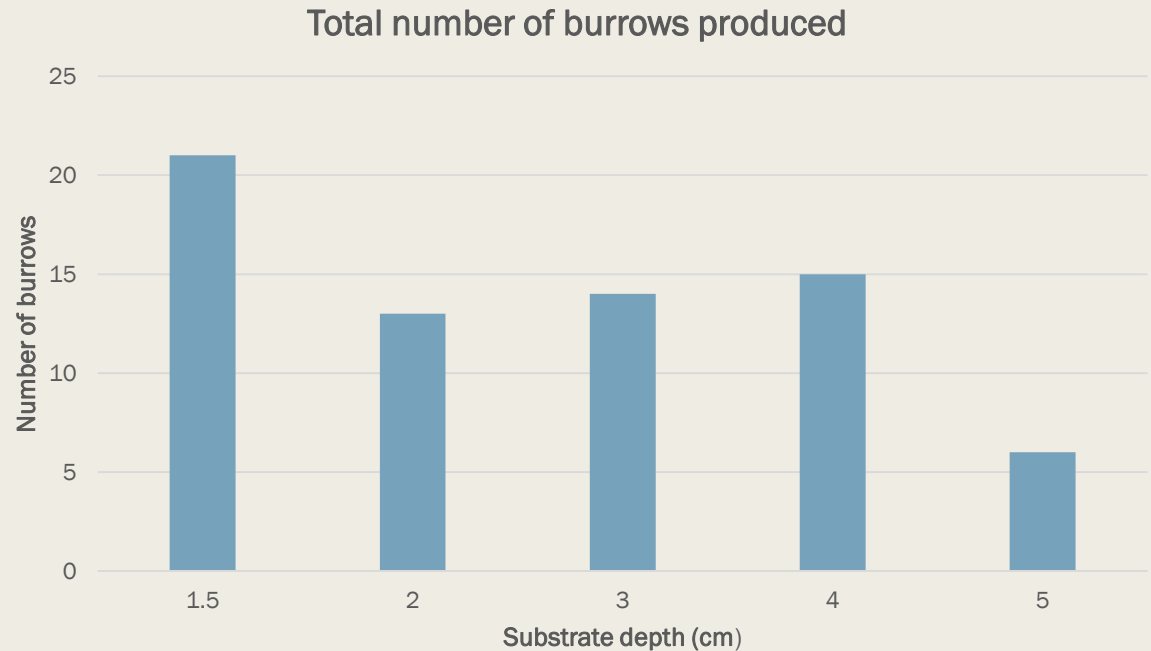


$P=.503$

# ZSL RESULTS

## Substrate depth – number of burrows:

- Burrow abandonment.



## Substrate type:

- Mortality and welfare related concerns.
- Anecdotal observations.

# DISCUSSION

## Substrate type

- Mix optimum, with some unsuitable for use in captivity – similarities with wild types (Crespo et al. 2014).

## Surface anchor points

- Encourages burrowing behaviour – captive welfare and informing conservation action.
  - Importance of vertical structures.

## Substrate depth

- Larger burrows at deeper depths – enabling full behav. repertoire?
- Less burrows abandonment - more suitable or welfare?

Importance of future research – ex-situ and in-situ

# EVIDENCE BASED RECOMMENDATIONS

- Mixtures of substrates are encouraged.
- Sand and chalk should be avoided as enclosure substrate.
- Enclosure design should include an anchor point of at least 4 cm to aid burrowing.
- Minimum depth 3cm... ideally 5cm.

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Thank you for listening!

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