

The current state of biological control of wasps in NZ

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Vespula germanica
(German wasp)



Mid-1940s

Vespula vulgaris
(common wasp)

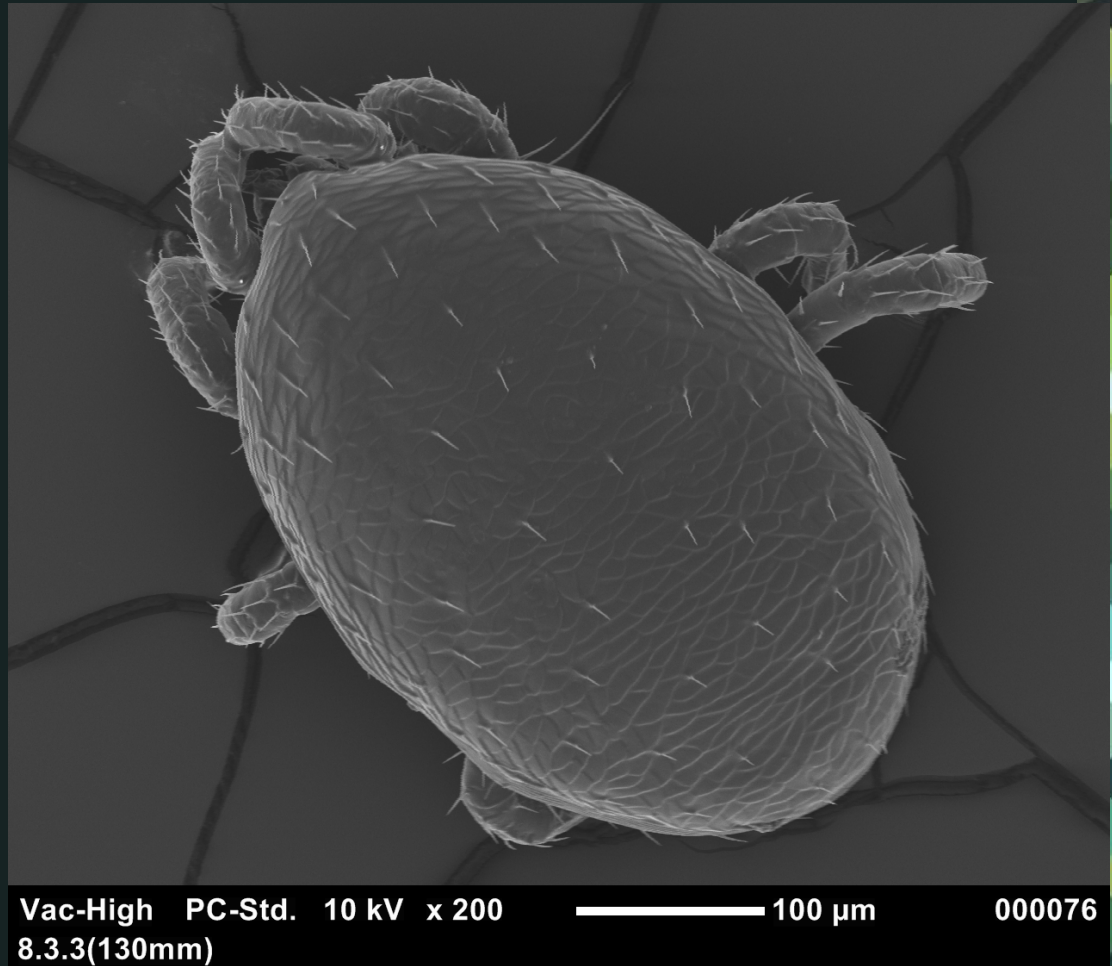


Late 1970s – early
1980s



Pneumolaelaps niutirani

- NOT purposefully introduced to NZ!!
- Very little is known about this group
- SFF project from July 2014

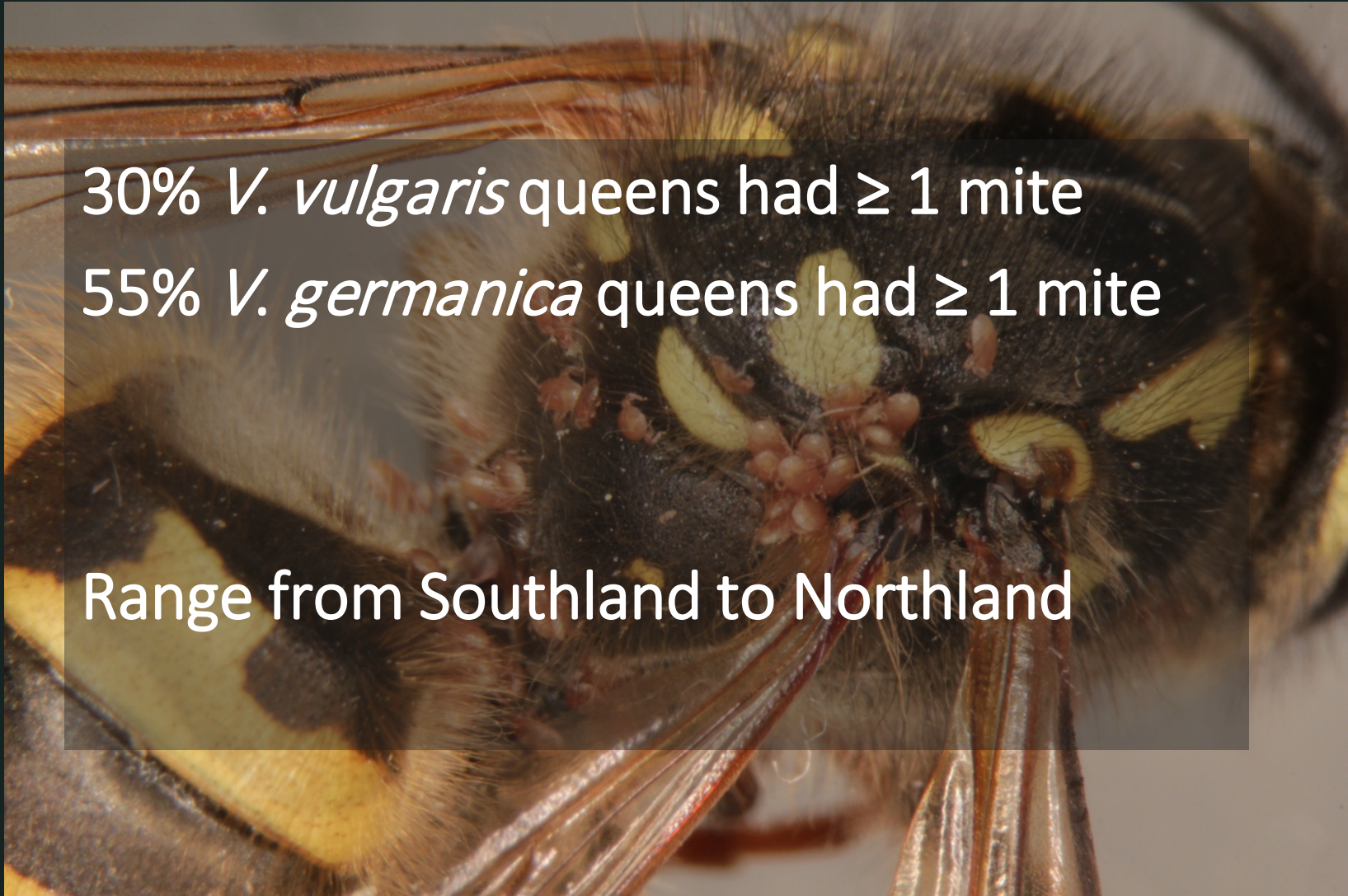


Over wintering queen survey

30% *V. vulgaris* queens had ≥ 1 mite

55% *V. germanica* queens had ≥ 1 mite

Range from Southland to Northland



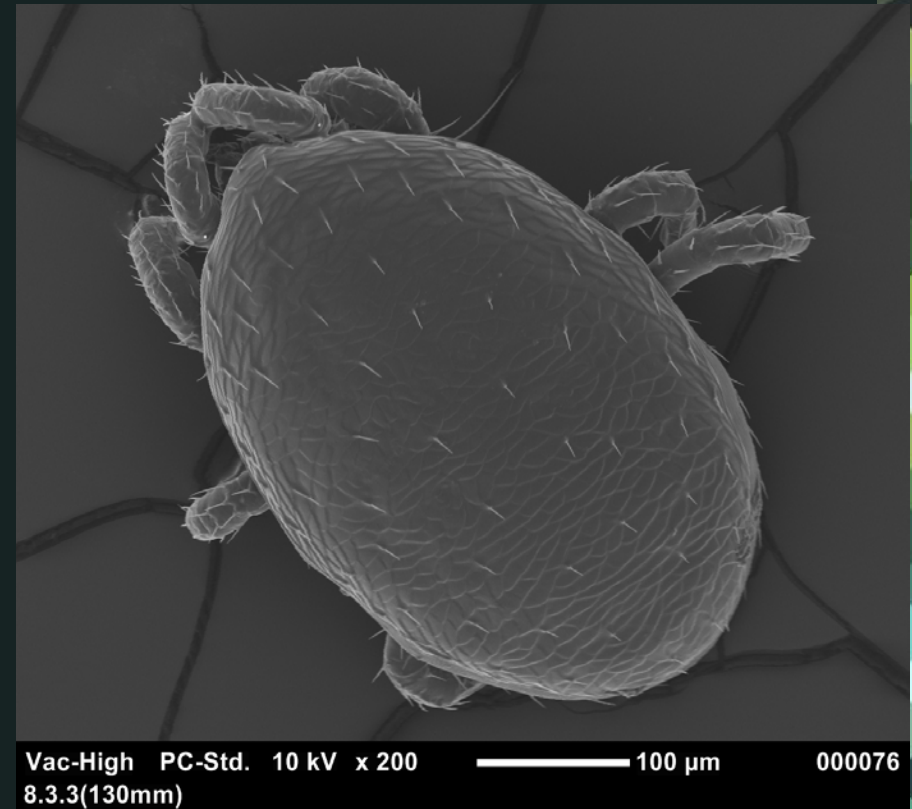
“Normal” nests avg 11,870 cells
Infested nests avg 4,076 cells



Survey results: mite infested nests are 1/3
“normal” nest size

Pneumolaelaps niutirani

- Appear to be “social parasite” instead of direct, or classic, natural enemy
- Likely a vector of disease between colonies...still working on pathogen load



Sphecophaga spp.

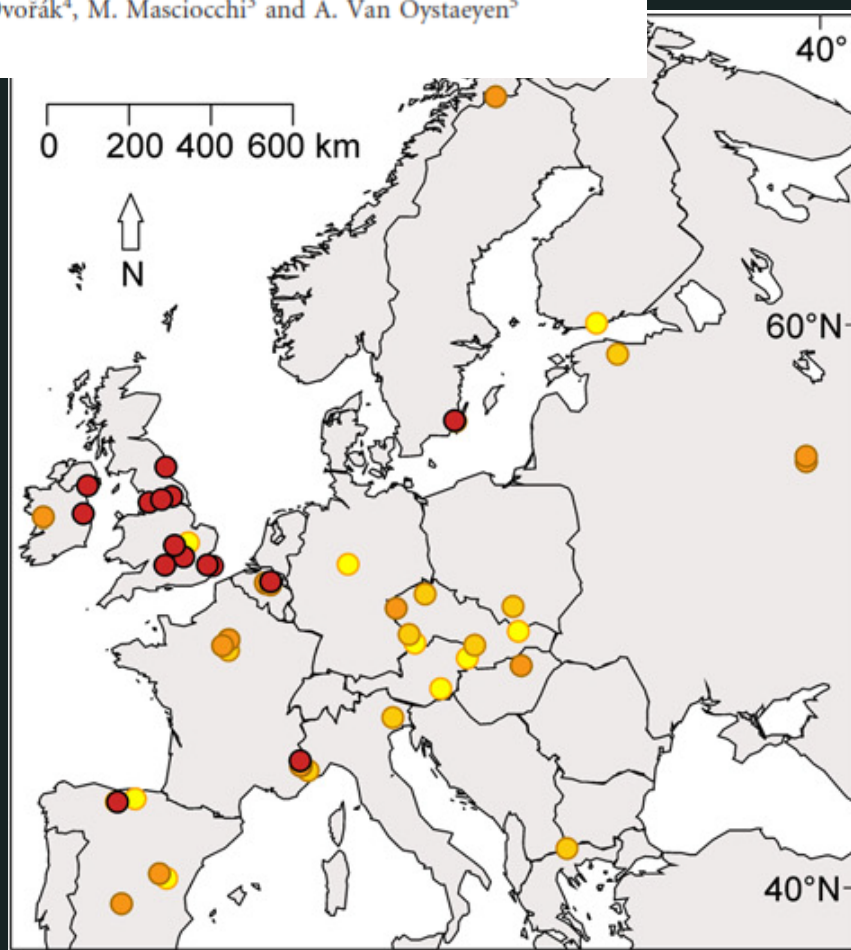
- 3 spp introduced to NZ
1980s – 1990s
- Specific to social wasps
- Considered to be unsuccessful
 - 2 likely reasons
 - Low genetic diversity
 - Range disparity

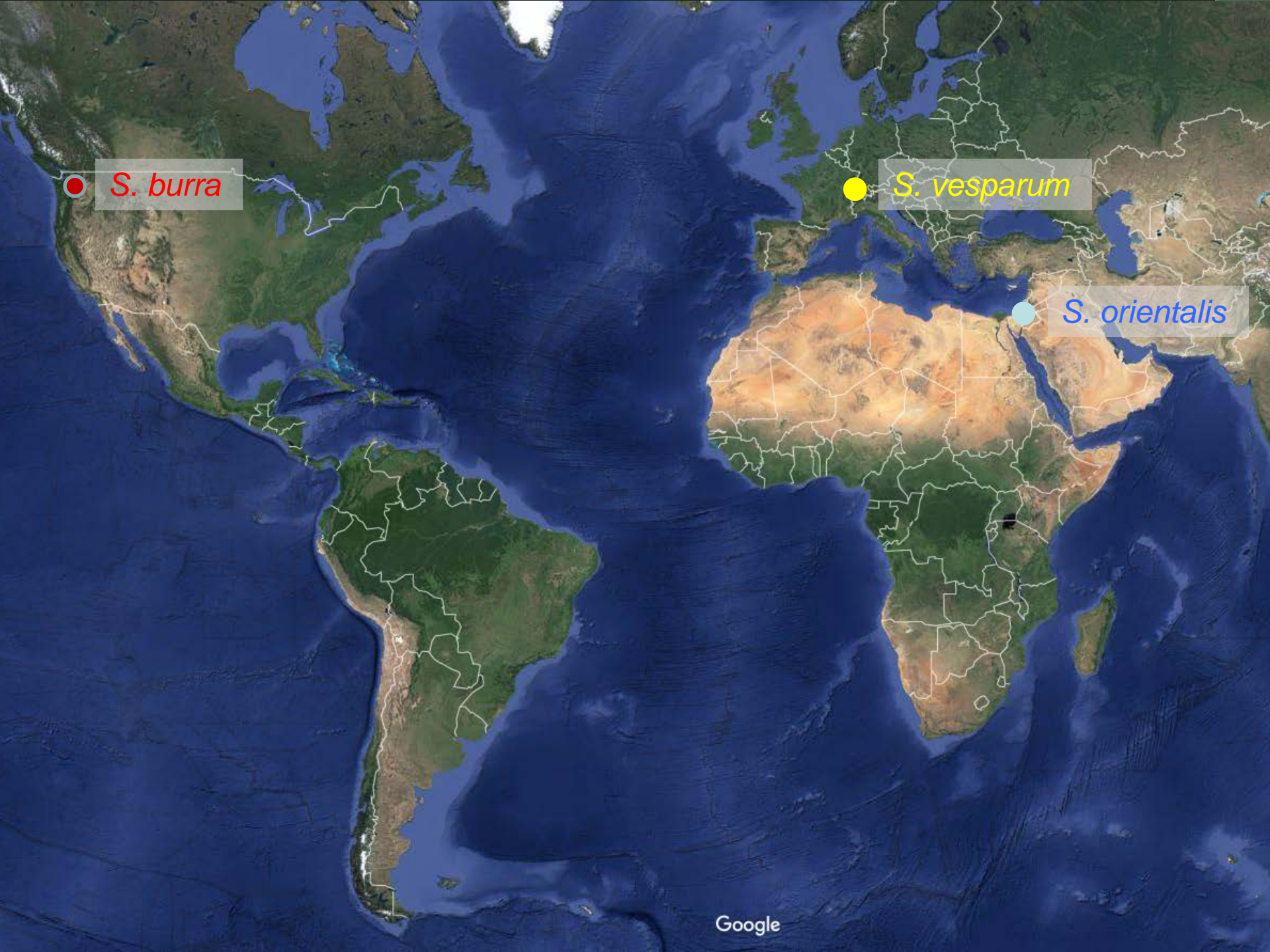




Determining the origin of invasions and demonstrating a lack of enemy release from microsporidian pathogens in common wasps (*Vespula vulgaris*)

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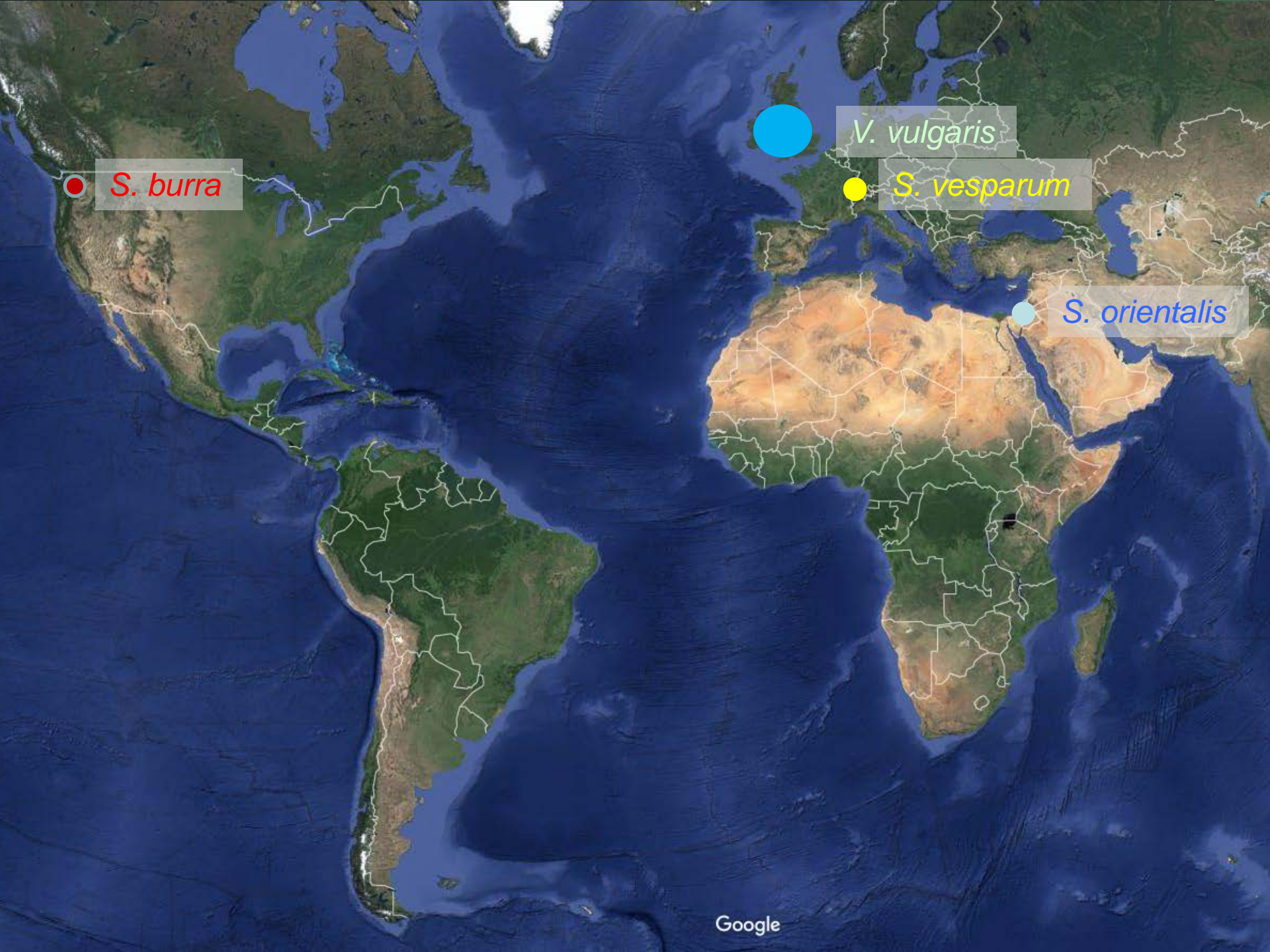




● *S. burra*

● *S. vesparum*

● *S. orientalis*



● *S. burra*

● *V. vulgaris*

● *S. vesparum*

● *S. orientalis*

Sphecophaga vesparum



Sphecophaga vesparum



Sphecophaga vesparum



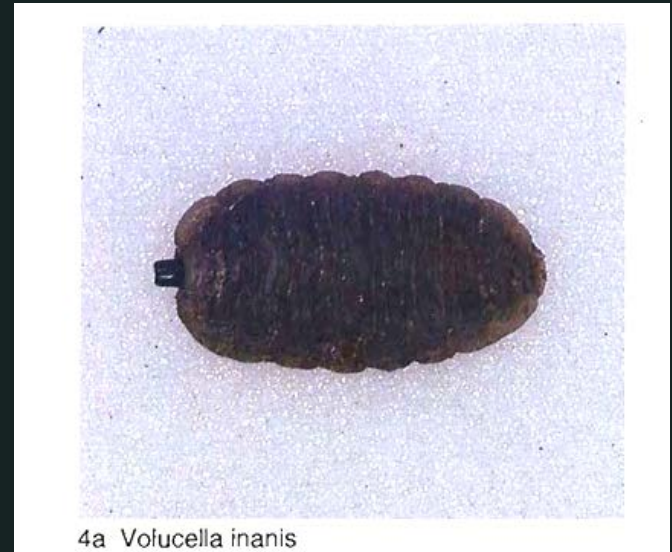
Revisit importing from the appropriate range?



Yes!



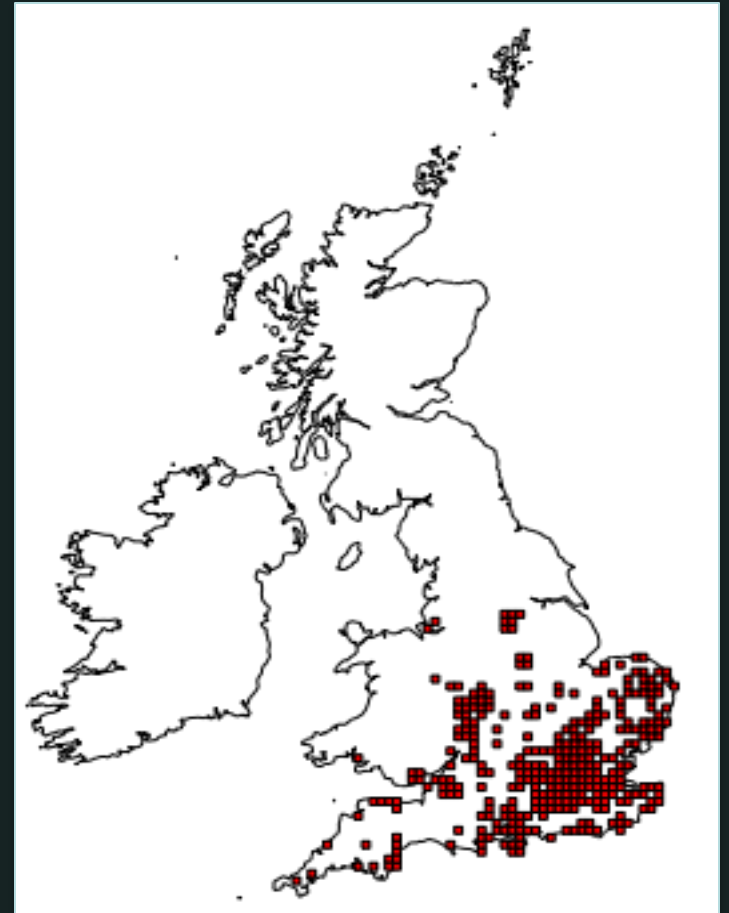
Volucella inanis



4a *Volucella inanis*

Volucella inanis

- Near perfect range match for *V. vulgaris*
- Found in *Vespula* & *Vespa* nests...pre-emptive biocontrol for future incursions
- Biology? Host range?
- Next up for SFF proposal?



Future work

- Hygienic behaviour avoidance by parasites of social wasps (NSC)
- Identify home range of NZ *V. germanica*!
- Reintroduce *Sphecophaga vesparum* from NZ *V. vulgaris*'s home range (UK)
- Host range test & biology of *Volucella*



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