

Current State of Wasp Biocontrol in NZ

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MANAAKI WHENUA

Acknowledgements

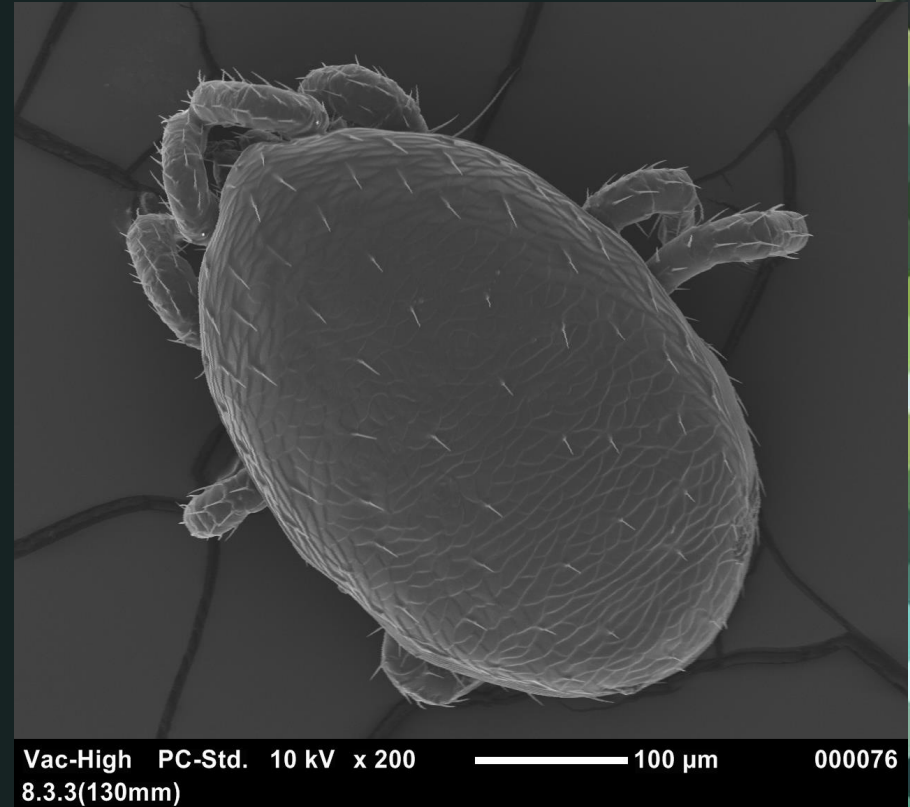
- MPI's Sustainable Farming Fund (SFF)
- MANY!!! co-funders & members of the public

Why are they so Invasive in NZ?

- Life cycle
- Biology/behaviour –super organism
- NZ environmental conditions
- No natural enemies
- Open niche

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

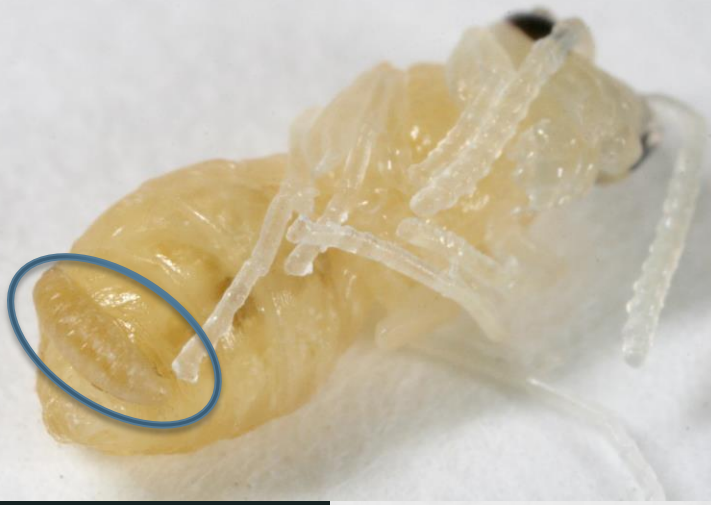


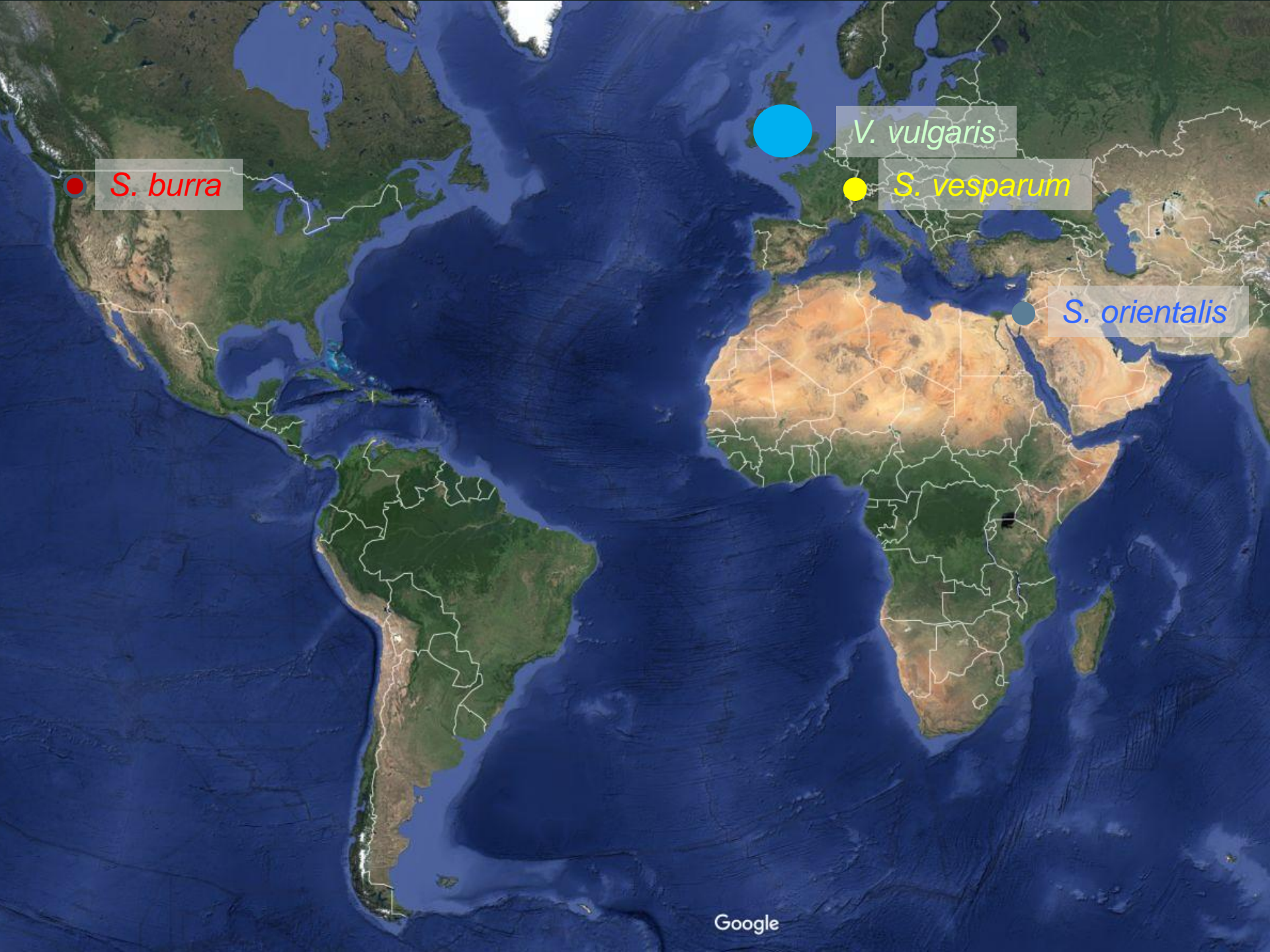
Sphecophaga spp.

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



Sphecophaga vesparum





● *S. burra*

● *V. vulgaris*

● *S. vesparum*

● *S. orientalis*

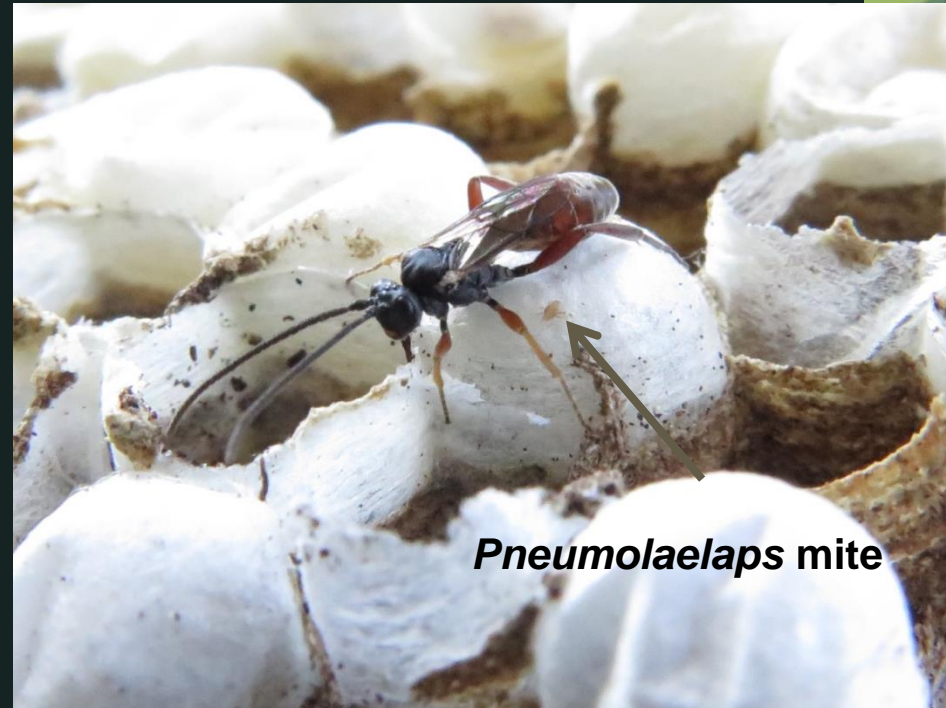


<https://www.youtube.com/watch?v=IXhx2tBGnDg>



Sphecophaga vesparum

- New genetic stock collected in UK
- Also opportunity to survey for other enemies
- Rearing of new stock on-going



New SFF starting in July!

- Investigate new potential biological control agents suitable for use in NZ
- Many natural enemies found in *Vespula*'s home range

What's on the wishlist?



#1



#2



#3

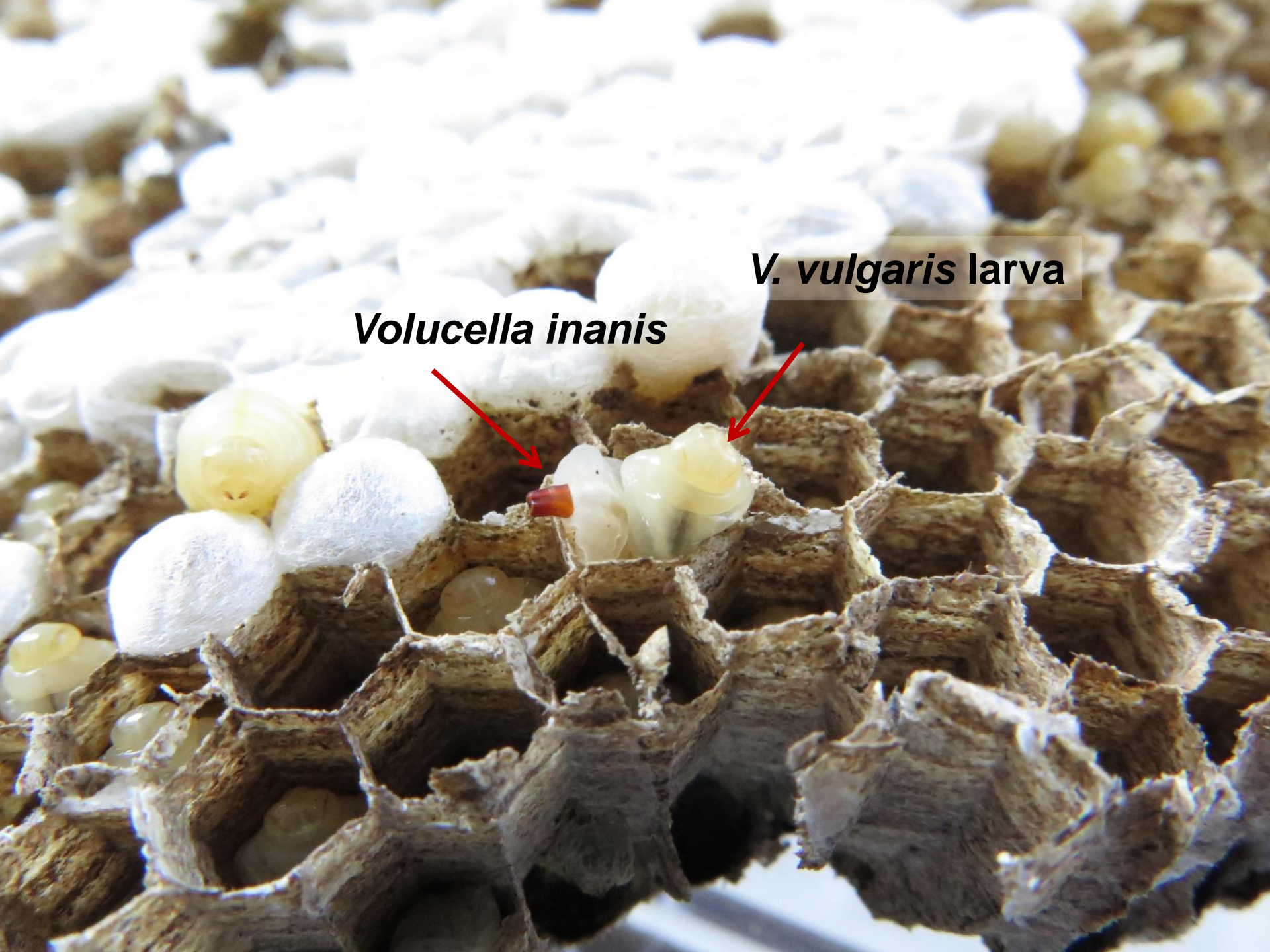
#1 *Volucella inanis*

- Excellent range match for NZ's common wasp
- Brood parasite of *Vespula* & *Vespa*...pre-emptive biocontrol???
- Found in many nests in 2016 UK survey



<https://www.youtube.com/watch?v=n2H78L8Vrnl>





Volucella inanis

***V. vulgaris* larva**



Count the *Volucella* larvae!

#2 *Leopoldius spp*

- Parasites adult Vespids. Another pre-emptive biocontrol???
- Could be released from parasitism
- Species active at different times



#3 *Metoecus paradoxus*

- Brood parasite of *Vespula*
- Also found in many nests in 2016 UK survey
- Complex life history



A photograph showing a cross-section of a wasp nest. The nest is made of a brown, fibrous material. Several cells are visible, containing different stages of wasp development. Two cells in the upper part of the nest contain yellowish, segmented pupae. A cell in the lower part of the nest contains a smaller, more translucent larva. Red arrows point from text labels to these specific cells. The background is a blue surface.

***V. vulgaris* pupa**

***Metoecus paradoxus* larva**

Future work

- Reintroduce *Sphécophaga vesparum* to NZ from UK (so close!)
- Identify home range of NZ *V. germanica* (collab w/ Lester group at Vic Uni)
- Host range test & biology of new agents: *Volucella*, *Leopoldius* & *Metoecus*



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