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Biogeographical Patterns in Oak Gall Wasp-Parasitoid Communities Associated with Oregon White Oak, Quercus Garryana, Under Anthropogenic Change

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Biogeographical patterns in oak gall wasp-parasitoid communities associated with Oregon white oak, *Quercus garryana*, under anthropogenic change

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BACKGROUND

Fig 1(a): *Quercus garryana* (Garry/Oregon white oak) occurs along the west coast of North America. *Neuroterus saltatorius* (Hymenoptera: Cynipidae) underwent a **range expansion** from mainland to Vancouver Island, BC. It (b) occurs at low abundances in its native range, (c) and outbreaks in its expanded range **"ecological release"**.

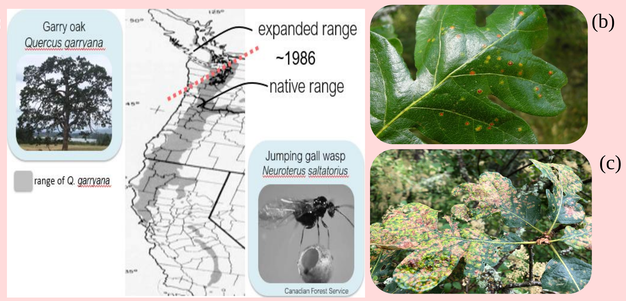
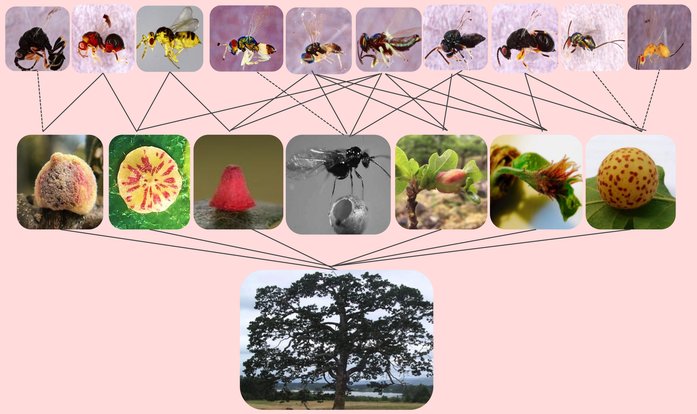


Fig 2: Over 23 cynipid species occur on *Q. garryana*. These species are hosts to **specialist parasitoid wasps** (attacks one host) and **generalist parasitoid wasps** (attacks many hosts).



OBJECTIVES

Describe patterns in parasitoid wasp diversity that attack cynipid hosts along the range of *Q. garryana*

Uncover if a loss of specialist parasitoids or reduced apparent competition by generalists contribute to ecological release of the range-expanding host

METHODS

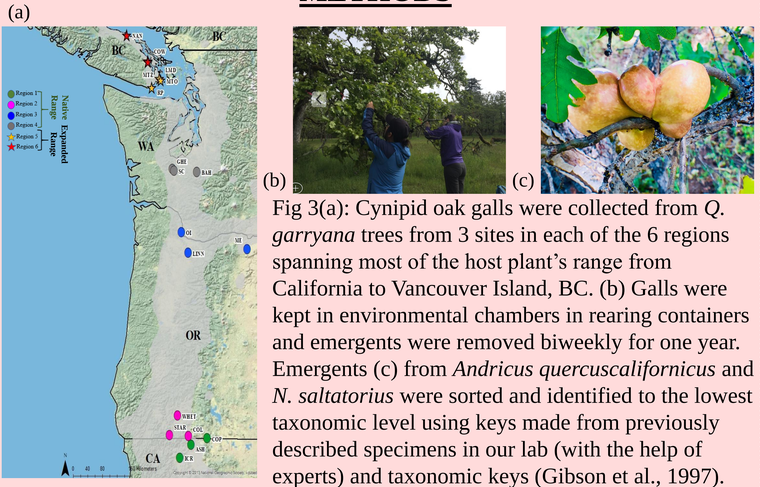
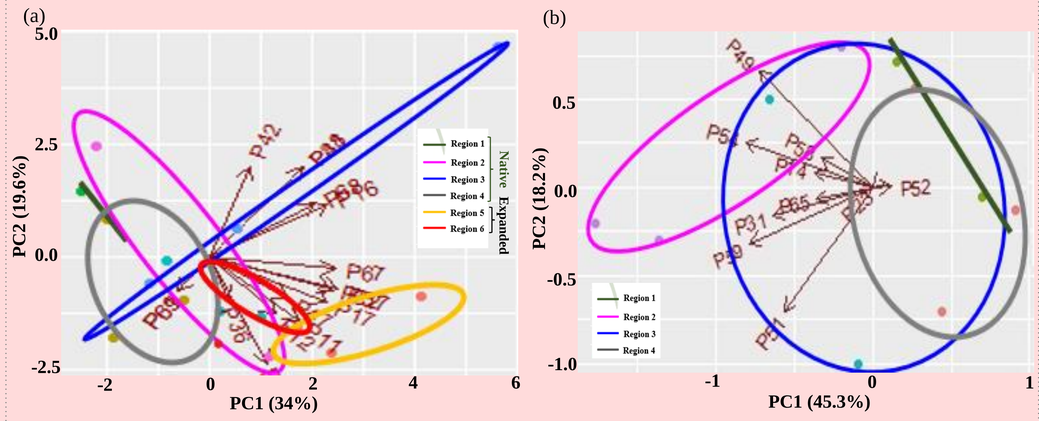


Fig 3(a): Cynipid oak galls were collected from *Q. garryana* trees from 3 sites in each of the 6 regions spanning most of the host plant's range from California to Vancouver Island, BC. (b) Galls were kept in environmental chambers in rearing containers and emergents were removed biweekly for one year. Emergents (c) from *Andricus quercuscalifornicus* and *N. saltatorius* were sorted and identified to the lowest taxonomic level using keys made from previously described specimens in our lab (with the help of experts) and taxonomic keys (Gibson et al., 1997).

RESULTS



- Fig 4(a): The parasitoid communities of *N. saltatorius* in Regions 5 and 6 do not have a strong overlap with the regions in the native range (1-4). 15 parasitoid species were found in the native compared to 9 in the expanded range. The main specialist of NS, (c) *Amphidocius shickae* (P37) (Hymenoptera: Pteromalidae) attacks in both the native and expanded range.
- *A. quercuscalifornicus* is found only in the native region of *N. saltatorius*. There (b) is a strong overlap in parasitoid species between regions in the range of *A. quercuscalifornicus*. Ten parasitoids were identified throughout the range.

(c) *Amphidocius schickae* (P37), the main specialist of *N. saltatorius.*

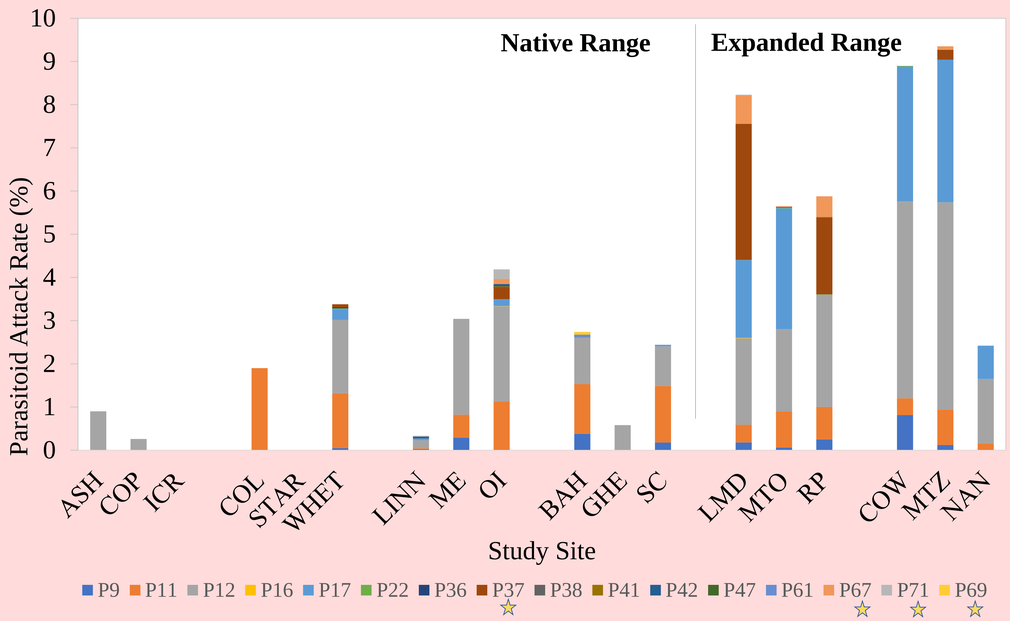


Fig 5: Attack rates (%) of the parasitoids in the native and expanded range of *N. saltatorius*. 4 species are specialists on *N. saltatorius*, 12 are generalists.

CONCLUSION

- Preliminary results suggest a different composition of parasitoid enemies attack *N. saltatorius* in its expanded range compared to its native range.
- So far, this seems like it is due to a change in the composition of known generalist parasitoids that attack the range-expanding host that may not be effectively switching other from other competitors and not from a loss of known specialists.
- There is no overlap in parasitoids with *A. quercuscalifornicus*, suggesting that it is not a competitor and does not contribute to the release of *N. saltatorius*.

Fig 6 (a): A cross section of a gall of *A. quercuscalifornicus* which can grow to 12 cm long by 8 cm across, while the (b) galls of *N. saltatorius* grow to 1 mm in diameter.

Fig 7: 24 gall types were collected from *Q. garryana*, including the range expanding species, *N. saltatorius*. **My larger thesis project will identify emergents from the whole community of cynipids.**

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