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OF AUSTRAL INVASIVE SALMONIDS

BASE

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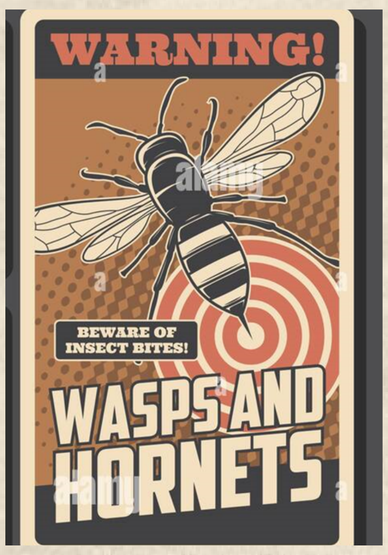


ALIEN INVASION AT THE SOUTHERMOST BIOSPHERE RESERVE!

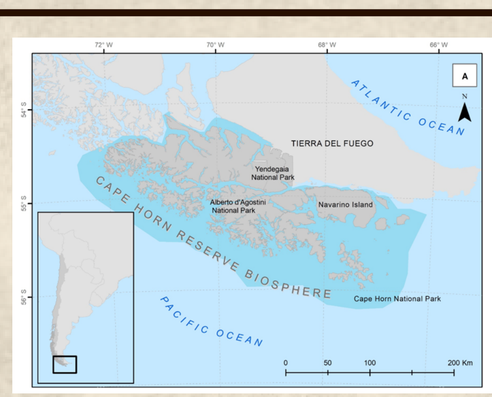
THE CASE OF INTRODUCED *VESPULA* WASPS

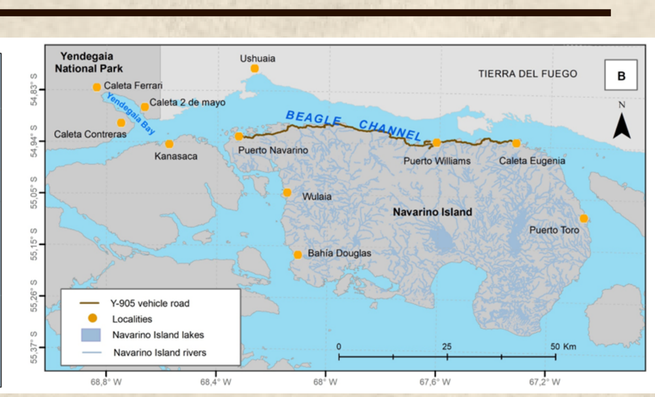
INTRODUCTION

- Vespula wasps, also known as "*yellow jackets*," are eusocial insects native to the Holarctic region that have become successful invaders in regions as distant as Australia, New Zealand, and South America.
- They can live in high densities in both urban and rural areas, and their effects on natural and agricultural environments are well documented, while also represent a nuisance to human society and a threat to health.
- The presence of non-native vertebrates (beavers, rodents, mink, dogs, salmonids) and their potential impacts on native wildlife are well studied, invertebrates have received minimal attention.

METHODS

- Study region
- A systematic monitoring from 2015 to 2021: compilation of records
- Foraging associations: Resource exploit
- Statistics: significant findings





RESULTS

- **COMPILATION OF RECORDS**
  - TWO *VESPULA* SPECIES
  - INVASION HISTORY
  - A SUCCESFUL INVADER
- **RESOURCE EXPLOIT**
  - NICHE PLASTICITY
- **SIGNIFICANT FINDINGS**
  - POLLINATOR THREATS
  - NECTAR ROBBING
  - NATIVE BIOTA INTERACTIONS

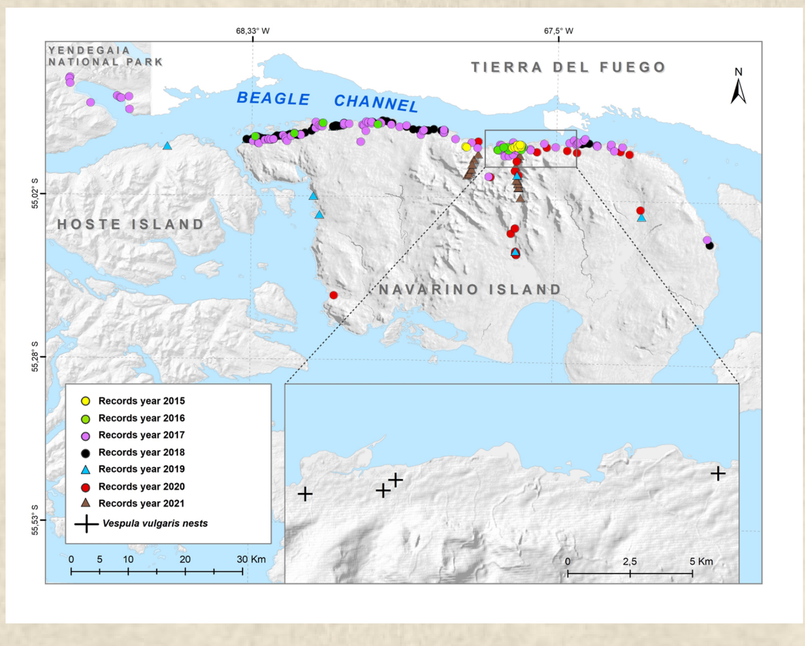


Figure 2. *Vespula vulgaris* distribution records (n : 224, colored circles and triangles) and studied nests (black crosses and zoomed) in the southern area of the Cape Horn Biosphere Reserve.

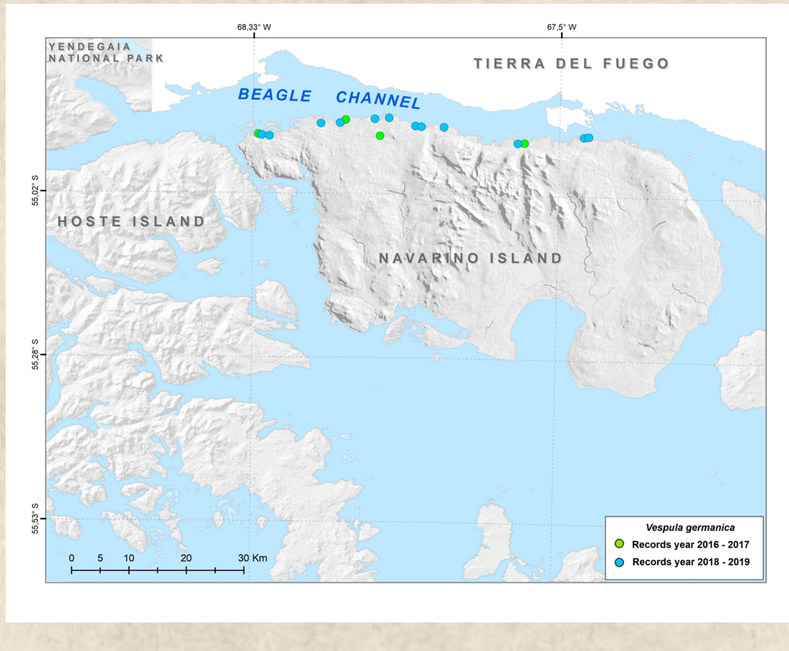


Figure 3. *Vespula germanica* distribution records (n : 32, colored circles) in the Cape Horn Biosphere Reserve. Records from 2016-2017 and 2018-2019 were documented in the same locations

Table 1. *Vespula* wasp associations with native and non-native biota in the Cape Horn Biosphere Reserve, southern Chile.

Species/ organisms	Flora/ fauna	Origin	Nature of interaction
Baccharis patagonica	Shrub	Native	Hunting for arthropods
Berberis microphylla	Shrub	Native	Foraging berries
B. ilicifolia	Shrub	Native	Foraging berries
Chiliotrichum diffusum	Shrub	Native	Hunting for arthropods
Drimys winteri	Tree	Native	Eating petals from flowers
Embothrium coccineum	Tree	Native	Nectar robbing
Empetrum rubrum	Shrub	Native	Foraging berries
Gaultheria mucronata	Shrub	Native	Foraging berries
Nothofagus antarctica	Tree	Native	Hunting for arthropods and chewing branches for wood pulp
N. betuloides	Tree	Native	Hunting for arthropods and chewing branches for wood pulp
N. pumilio	Tree	Native	Hunting for arthropods and chewing branches for wood pulp
Ribes magellanicum	Shrub	Native	Foraging berries
R. uva-crispa	Shrub	Non-native	Foraging berries
Rubus geoides	Herb	Native	Foraging berries
Ru. idaeus	Herb	Non-native	Foraging berries
Taraxacum officinale	Dandelion	Non-native	Eating petals from flowers
Aegorhinus vitulus	Weevil	Native	Predation
Ericchius femoralis	Stag beetle	Native	Opportunistic robbery of tree sap
Rhionaeschna variegata	Dragonfly	Native	Defence when approaches nests
Anyphaenidae	Spiders	Native	Predation
Araneidae	Spiders	Native	Predation
Geometridae	Geometer moths	Native	Predation on larvae
Lycosidae	Spiders	Native	Predation
Syrphidae	Hover flies	Native	Predation
Tipulidae	Crane flies	Native	Predation

Figure 3. Examples of *Vespula vulgaris* associations with native biota.

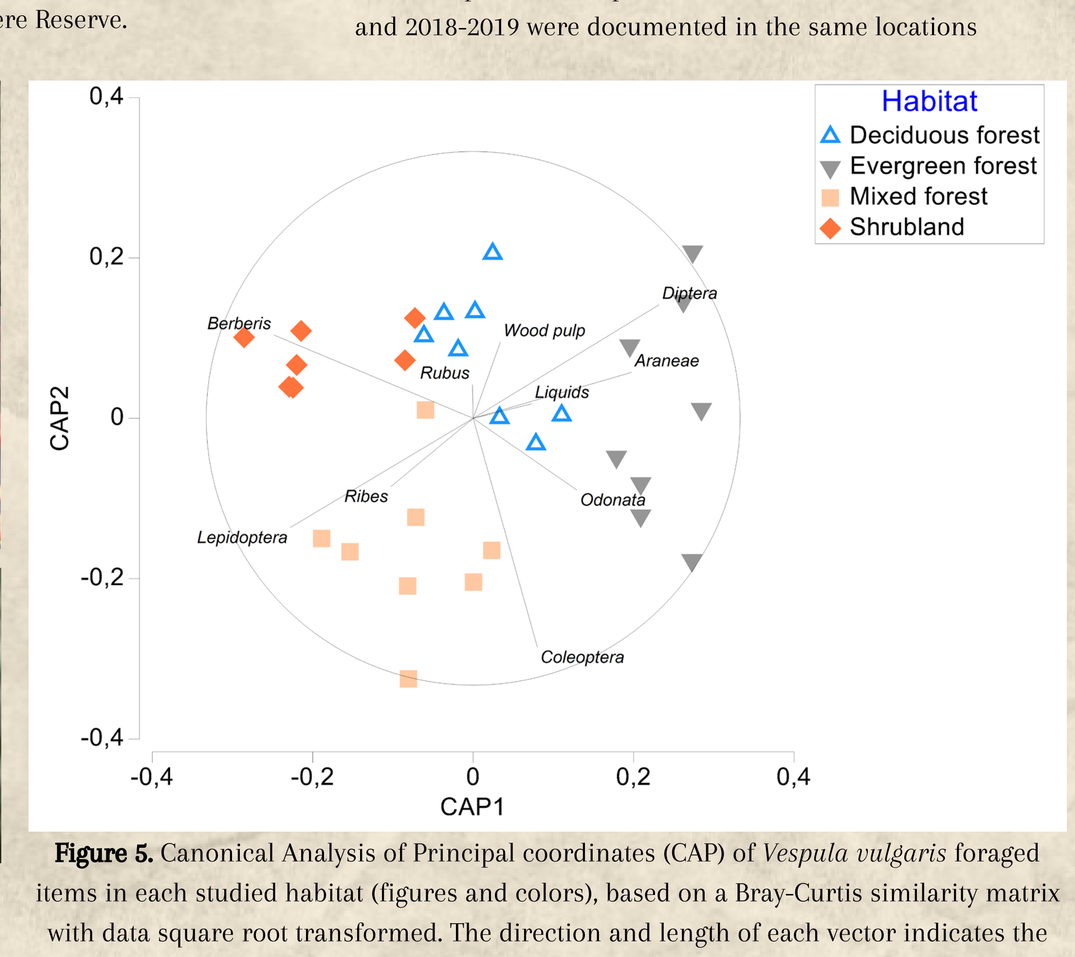


Figure 5. Canonical Analysis of Principal coordinates (CAP) of *Vespula vulgaris* foraged items in each studied habitat (figures and colors), based on a Bray-Curtis similarity matrix with data square root transformed. The direction and length of each vector indicates the abundance of a specific item and the strength of the correlation, respectively

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Rendoll-Cárcamo, et al. (2022). Biological Invasions, 24(7), 2103-2112. doi: 10.1007/s10530-022-02765-y

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