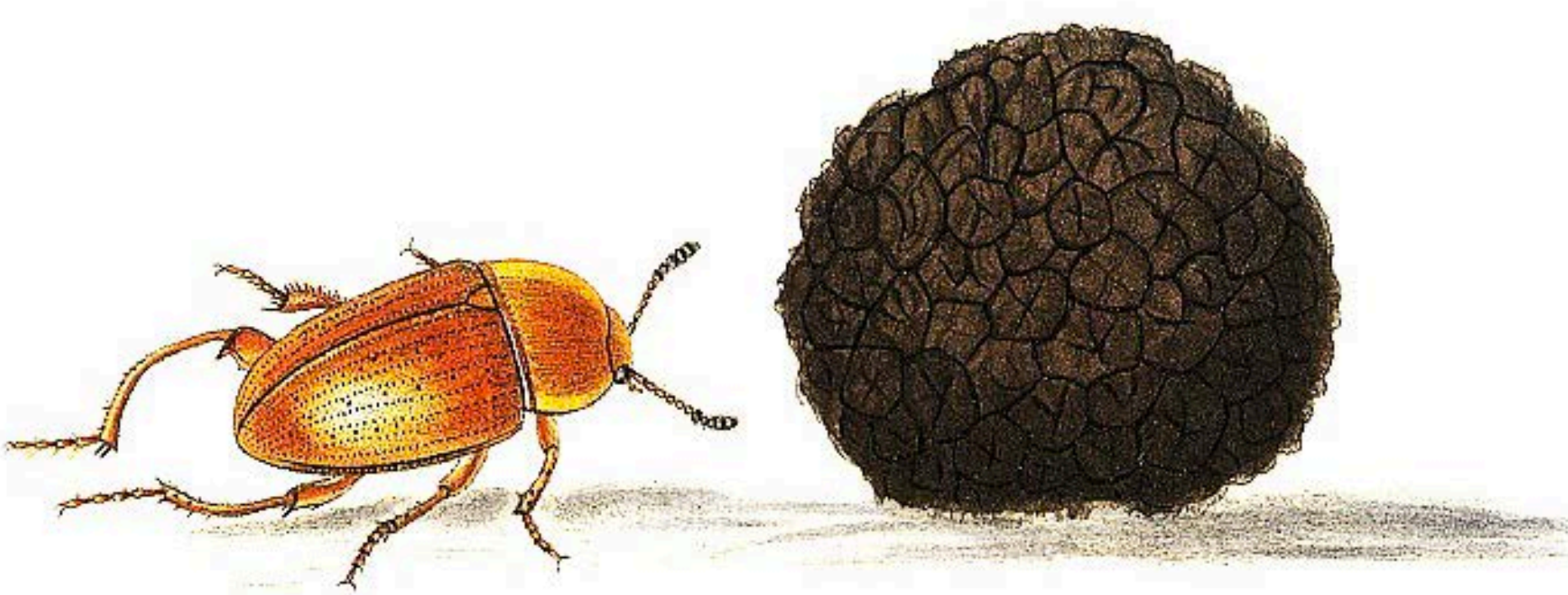


Australian truffle beetles

and the insect fauna of truffieres

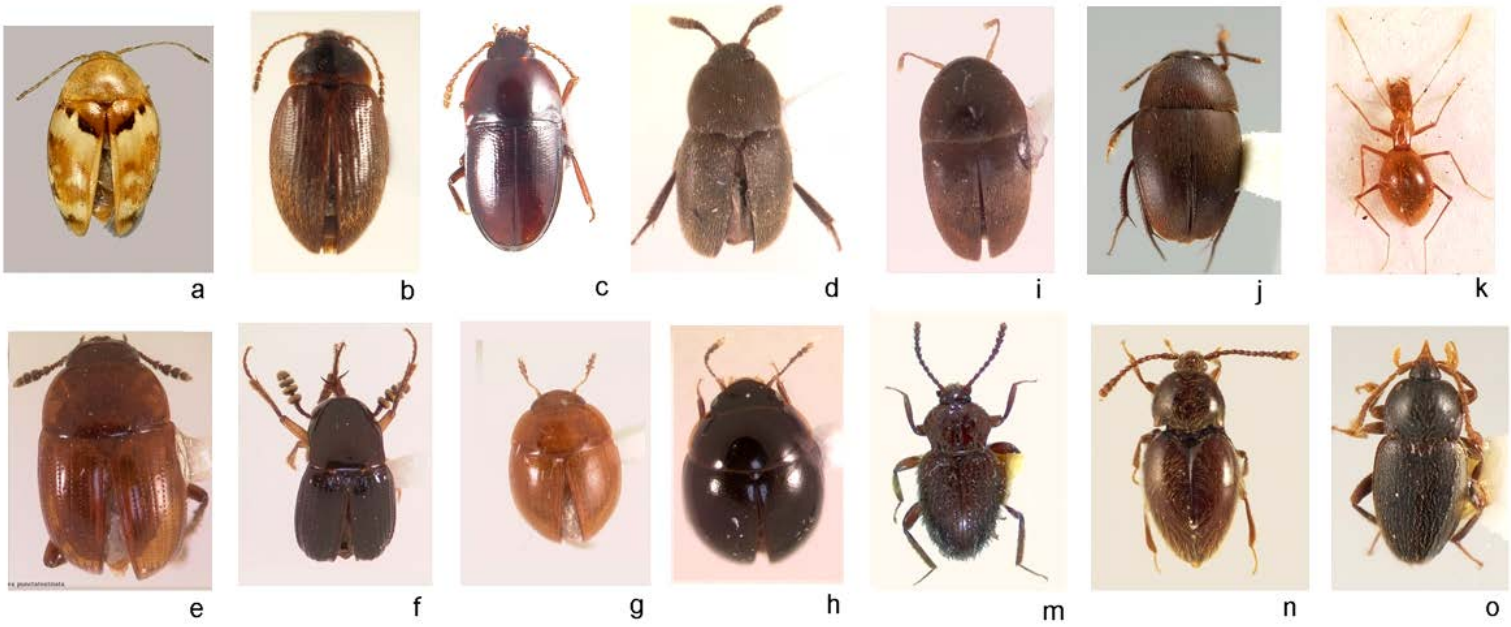
Ainsley Seago
Australian National Insect Collection
CSIRO Ecosystem Sciences*

www.csiro.au

Fungus beetles: the family Leiodidae

Coleoptera: Staphylinoidea: Leiodidae

- Feed on truffles, polypores, slime molds, puffballs, etc…
- Diagnosed by “interrupted” antennal club w/ reduced 8th segment



Fungus beetles: the family Leiodidae

Extreme troglobitism (ice caves in NA; caves in Western Europe)

Fungus beetles: the family Leiodidae

Ectoparasites/ inquilines of aquatic mammals (*Platypsyllus, Silphopsyllus*)

CSIRO

Fungus beetles: the family Leiodidae

-A successful relationship: fungus as evolutionary stepping-stone

- New paradigm for understanding diversification: repeated shifts from ancestral fungivory to new ecological niches, followed by radiation (e.g. Coccinellidae, Leiodidae, Erotylidae, Nitidulidae, Staphylinidae, etc etc…)

My ABRS research

- ~**3,000** described species of leiodids, **109** in Australia (so far…)
- My research: **describe new species of the Leiodidae subfamilies Leiodinae and Camiarinae.**

My ABRS research

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- My research: **describe new species of the Leiodidae subfamily Leiodinae.**
- In Europe, leiodines are **serious pests** of *T. melanosporum.*

Leiodes cinnamomea

Capturing Australian fungus beetle diversity

Australian Neopelatopini

- Putative slime mold feeders
- Morphological diversity; vampire beaks and spore pockets
- 6 described spp, 20+ new

CSIRO

Capturing Australian fungus beetle diversity

Australian Neopelatopini
Four supremely weird new genera w/ ~10 weird new species:

gen B sp 1

(Leiodids are supposed to look like this) →

Capturing Australian fungus beetle diversity

Australian Sogdini

- secretive lifestyle: underground fungus-feeders. Fly at dusk; mainly known from FITs
- At least four new genera, 14 new spp in Australia/NZ
- Most diverse in Tasmania? **3 genera, 4 spp.**

Gen C sp 2

Gen B sp 1

Gen A sp 3

CSIRO

My ABRS research

- Australia has many species of native truffle beetles, about which we know little. **What species ARE here?**

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- **Are native Australian truffle beetles a threat to Australian truffieres ?**

My ABRS research

- Australia has many species of native truffle beetles, about which we know little. **What species ARE here?**
- **Are native Australian truffle beetles a threat to Australian truffieres ?**

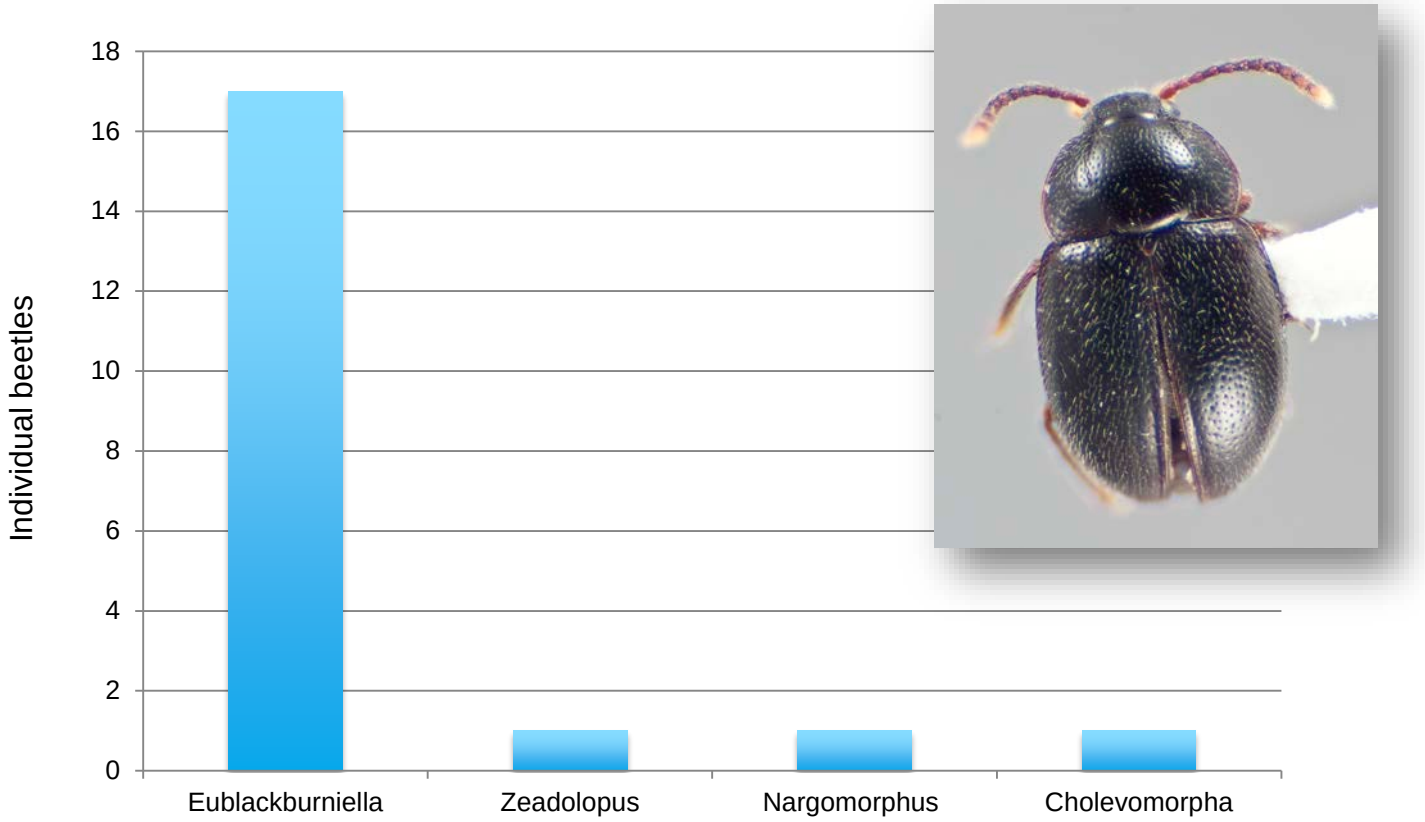
… in fact, **Australian truffle industry has almost no information about biodiversity issues**
(impacts of land use; susceptibility to pests; what is a truffle pest in Australia?)

Fieldwork

Sifting soil/ litter; hand collecting; **flight-intercept traps**
(Tasmania; NSW near Lake George)

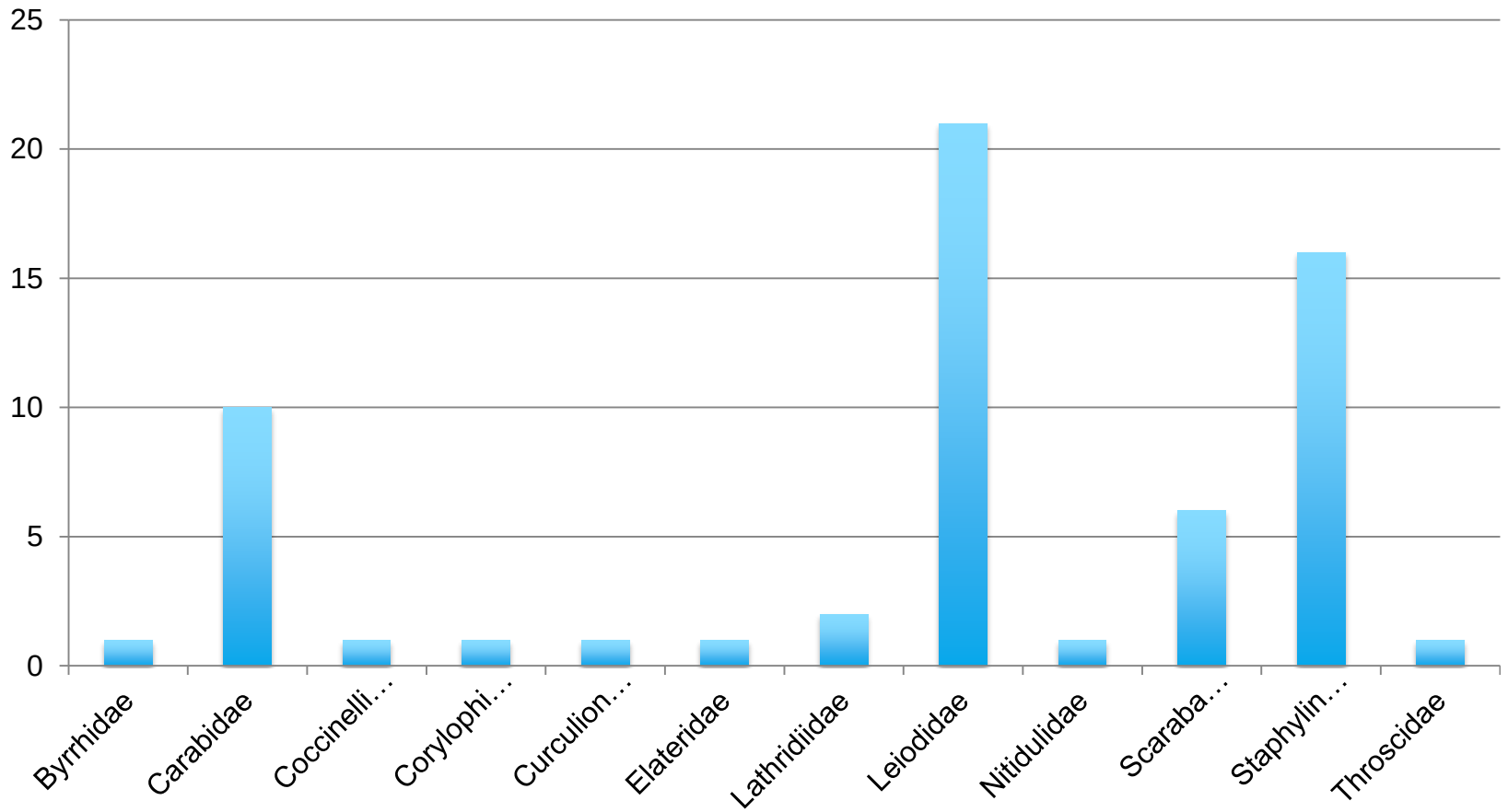
Survey results: pilot study

Leiodid diversity is spectacularly skewed…

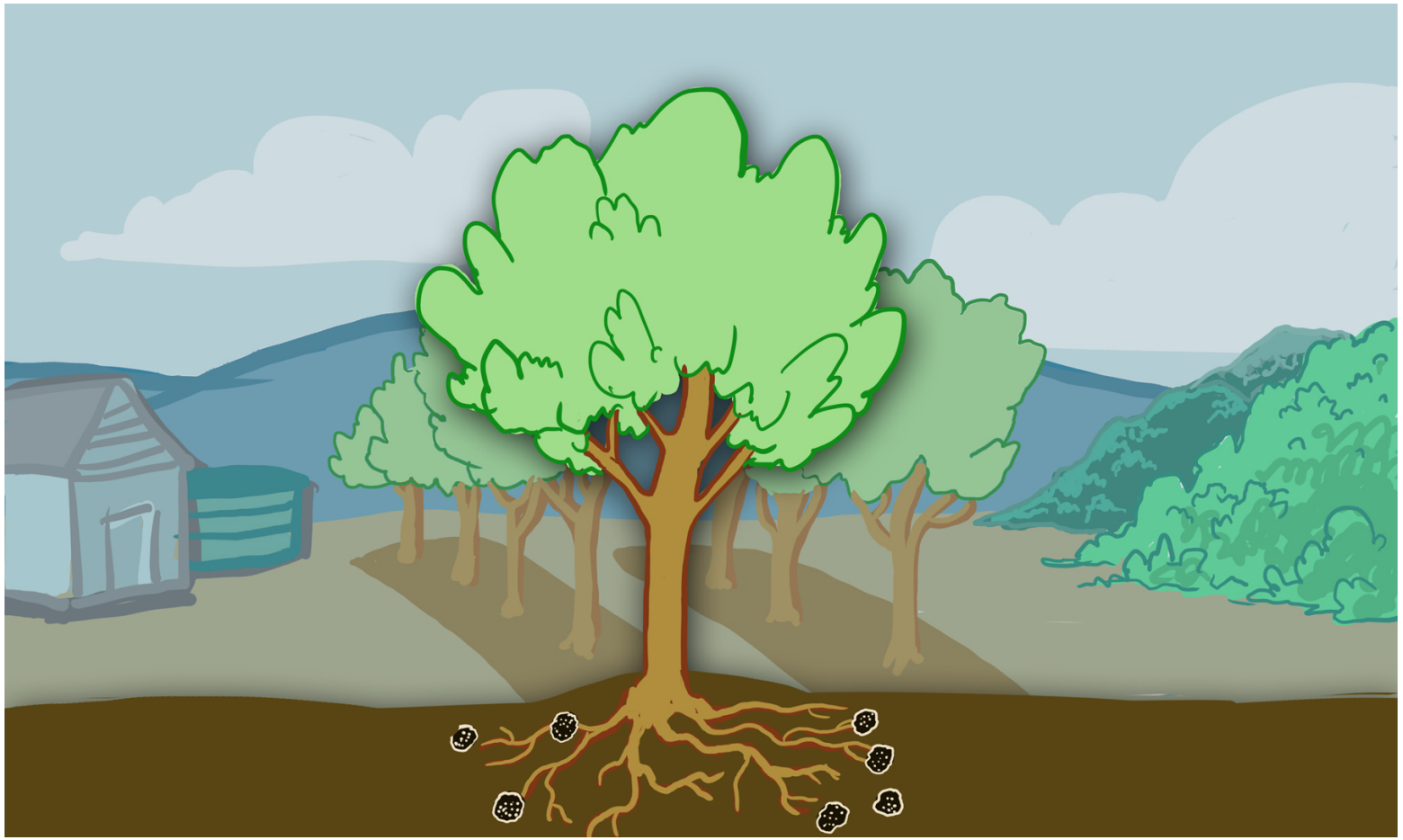


Survey results: pilot study

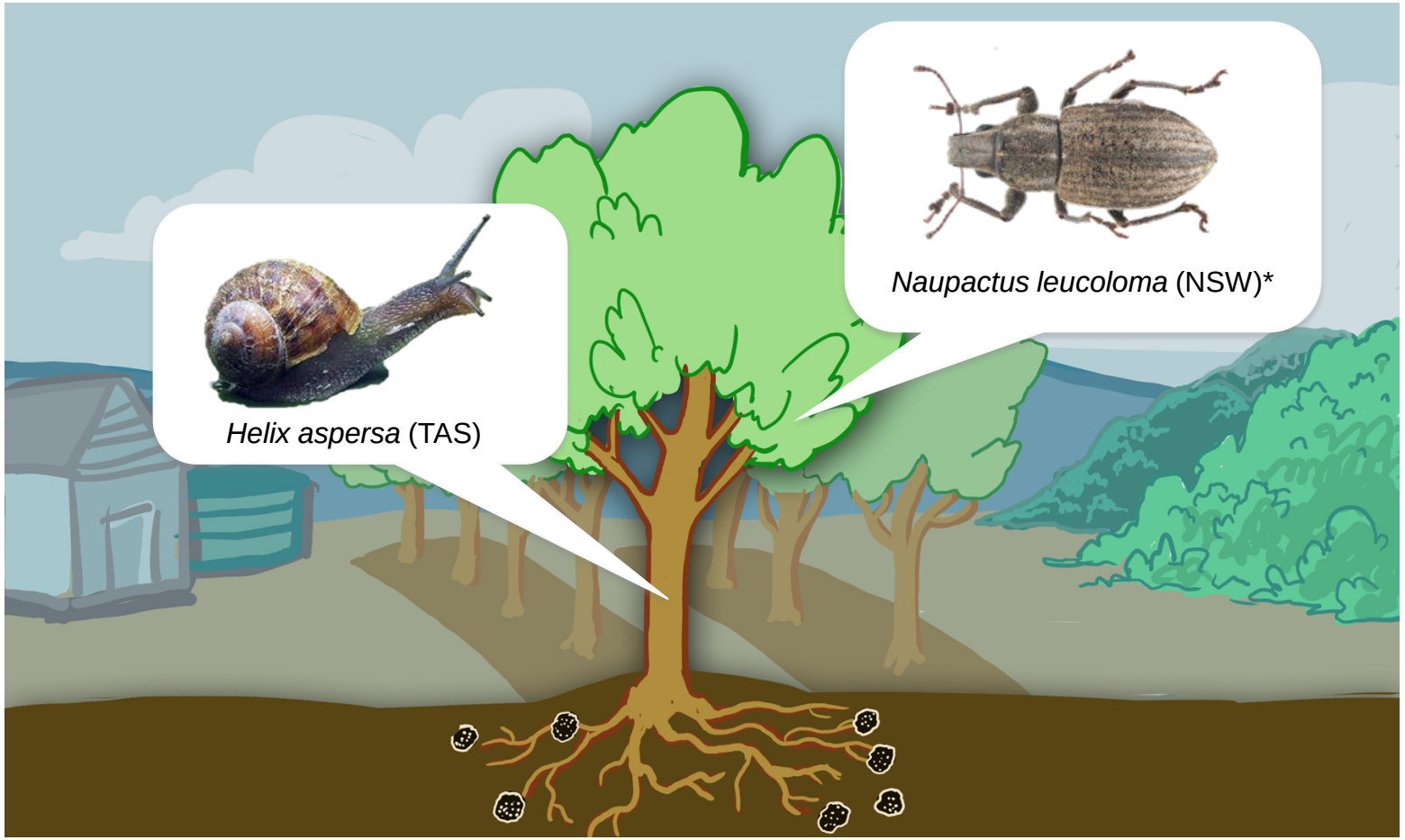
Staphylinoids aplenty; relatively high leiodid diversity



Truffiere as ecosystem

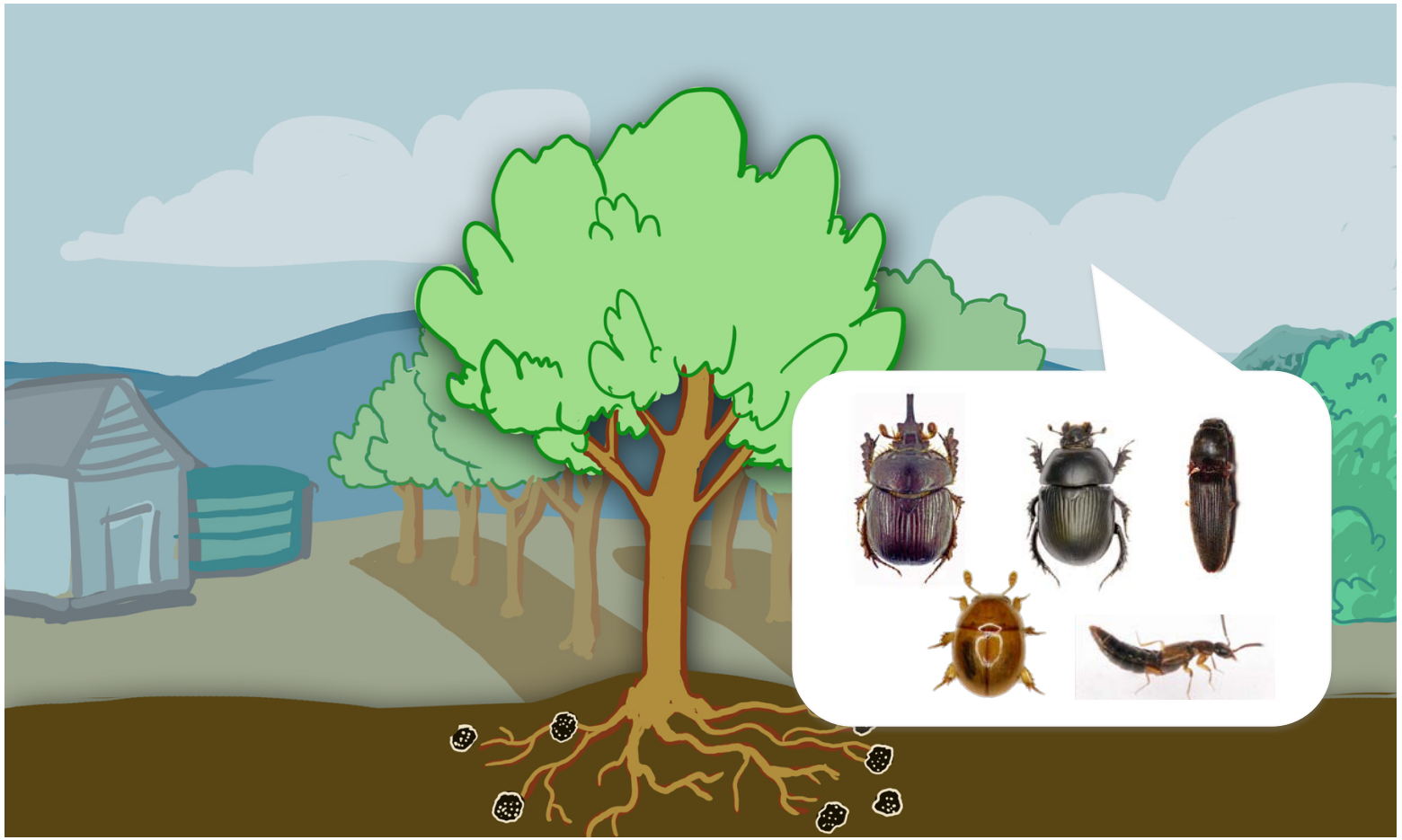


Truffiere as ecosystem



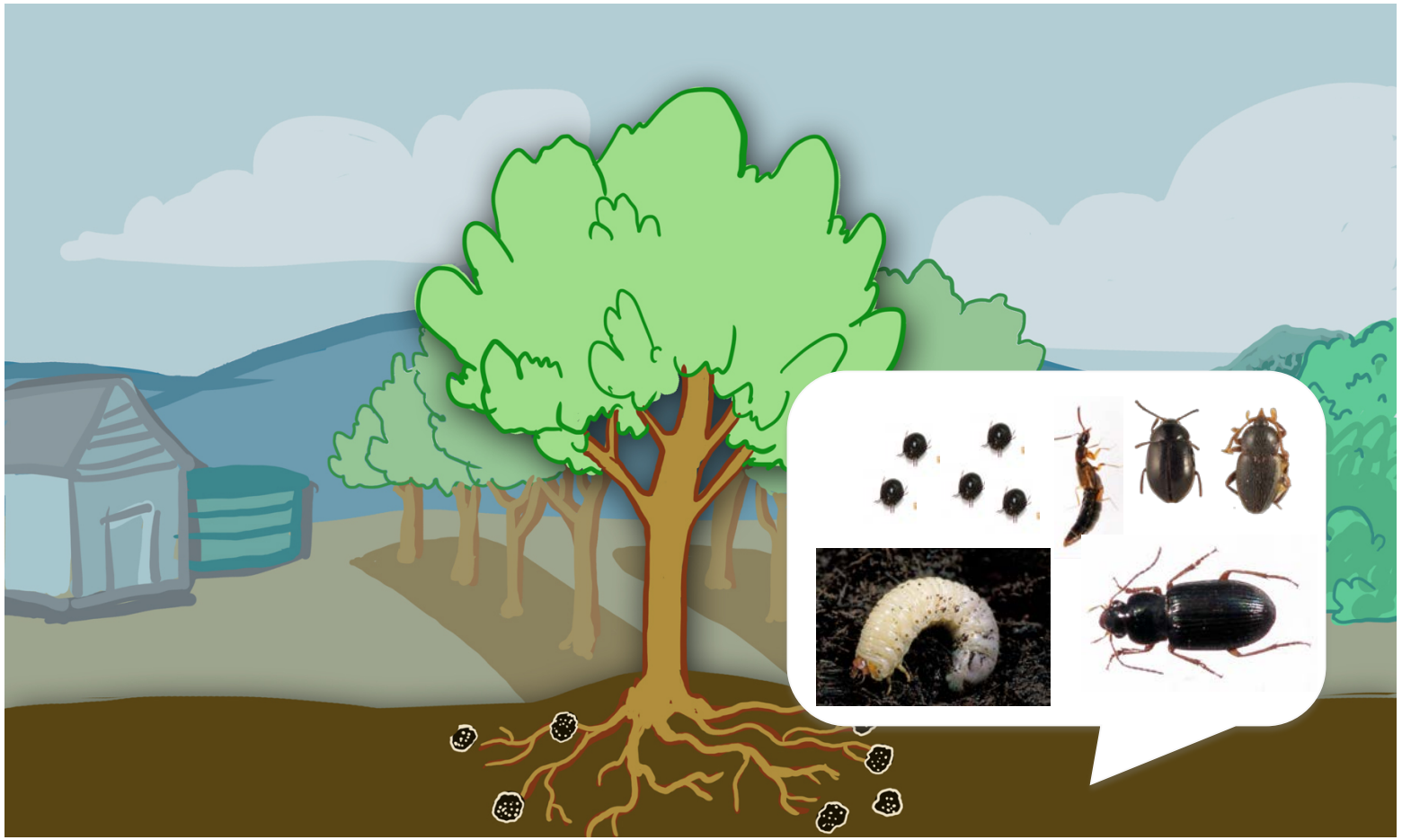
* *Naupactus* larvae can also damage buried driplines

Truffiere as ecosystem



Fly-throughs: Bolboceratine scarabs, small leiodids, elaterids, staphylinids, plus various pasture inhabitants

Truffiere as ecosystem



Soil and leaf litter inhabitants: slime mold leiodids; mites; curl grubs; small staphylinids

Potential pests:

White-fringed weevil
(*Naupactus leucoloma):*
Can defoliate oaks; larvae feed on starchy roots (carrots, potatoes, lucerne) and can damage driplines

Bolboceratine scarabs:
Known to feed on native truffles in WA; occur in Tasmania, ACT, and NSW, but almost no ecol. data outside WA. Look for “push-ups” at soil surface.

Bolbo grubs vs. curl grubs

“Curl grubs” = larvae of Christmas beetles and other ruteline/ melolonthine scarabs. Note **dark, sclerotized legs and head; often with dark-coloured rear end**

Bolboceratine scarabs

Likely allies:

Rove beetles
(Staphylinidae: Aleocharinae): Predators on fly larvae, plus other arthropods

Ground beetles (Carabidae): Roaming predators on and below soil surface. Feed on grubs, snails, caterpillars, etc.

Conclusions

-The Australian truffiere = complex agricultural ecosystem
that plays well with natural environment.

-Native fungus beetles (Leiodidae: Neopelatopini): abundant in leaf litter but not a pest.

-Keep your eyes out for developing pests of tree foliage or large-bodied truffle eaters, e.g. bolboceratine scarabs

GIVE ME YOUR BEETLES

I would like to continue identifying **truffiere-associated beetle specimens**, as well as any other insects that appear to be damaging truffles.

contact: aseago@gmail.com / 0400 349 376

Acknowledgements

Growers:
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