



Effects of host bark traits on trunk epiphyte communities

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Kauri (*Agathis australis*)



- Largest and longest lived of its genus
- Endemic to northern NZ 34-38 °S
- Mature kauri crowns host a diversity of epiphytes
- Shedding of kauri bark believed to be an adaptation to prevent epiphyte and liane establishment

Study aims

- Investigate whether kauri trunks support lower epiphyte abundance and diversity than those of other canopy tree species
- Examine the role of host bark traits in shaping epiphyte communities

Wyse, S. V., Burns, B. R. 2011. Do host bark traits influence trunk epiphyte communities? *New Zealand Journal of Ecology* 35: 296-301

Phorophyte species

Kauri (*Agathis australis*)



Bark smooth, shed in large flakes

Phorophyte species

Rimu (*Dacrydium cupressinum*)



Bark rough, shed in large flakes

Phorophyte species

Rewarewa (*Knightia excelsa*)



Bark smooth, not shed at observable rates

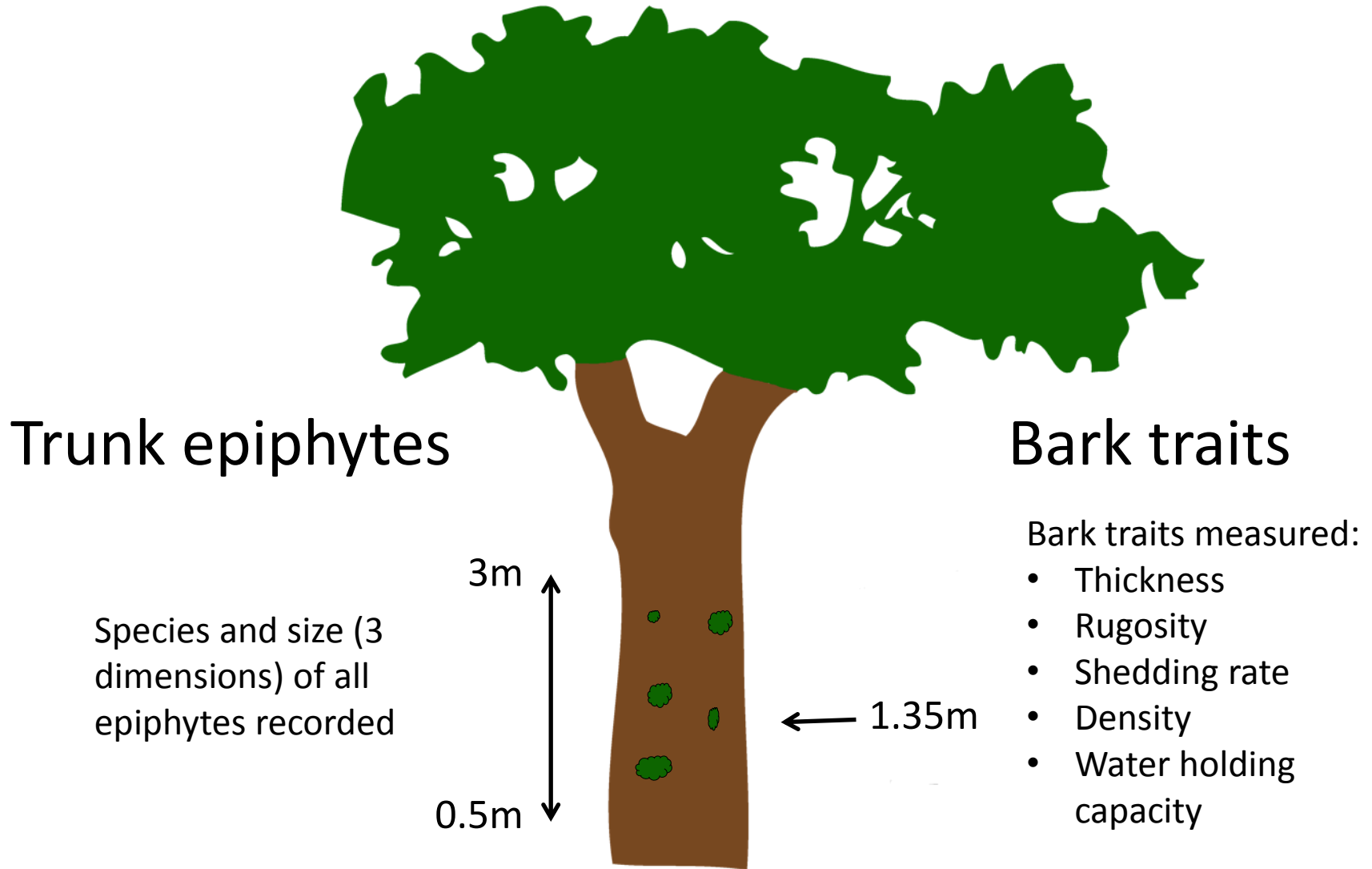
Phorophyte species

Puriri (*Vitex lucens*)

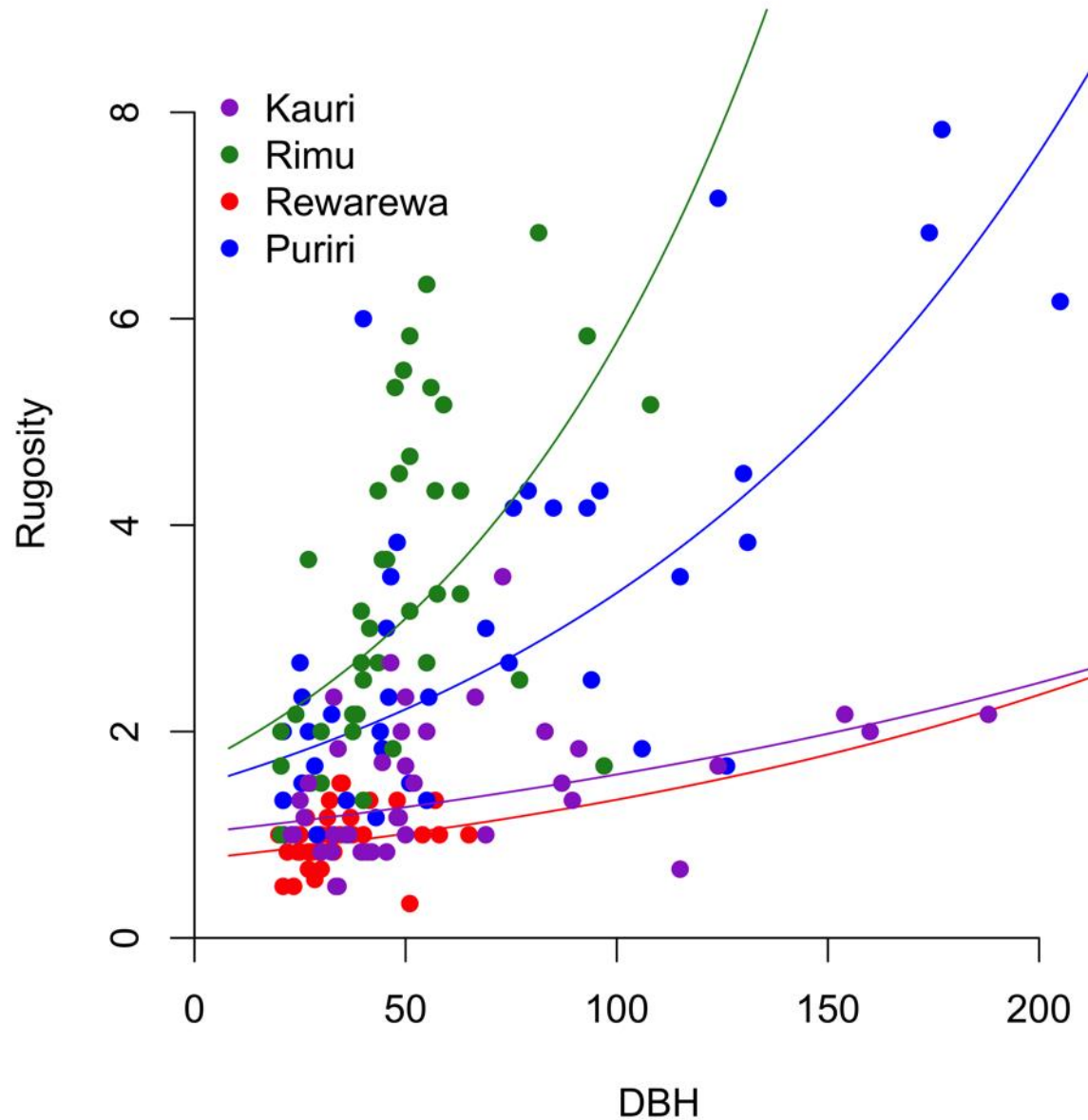


Bark rough, shed at low rates

Methods



Bark rugosity



Bark shedding rate

Kauri



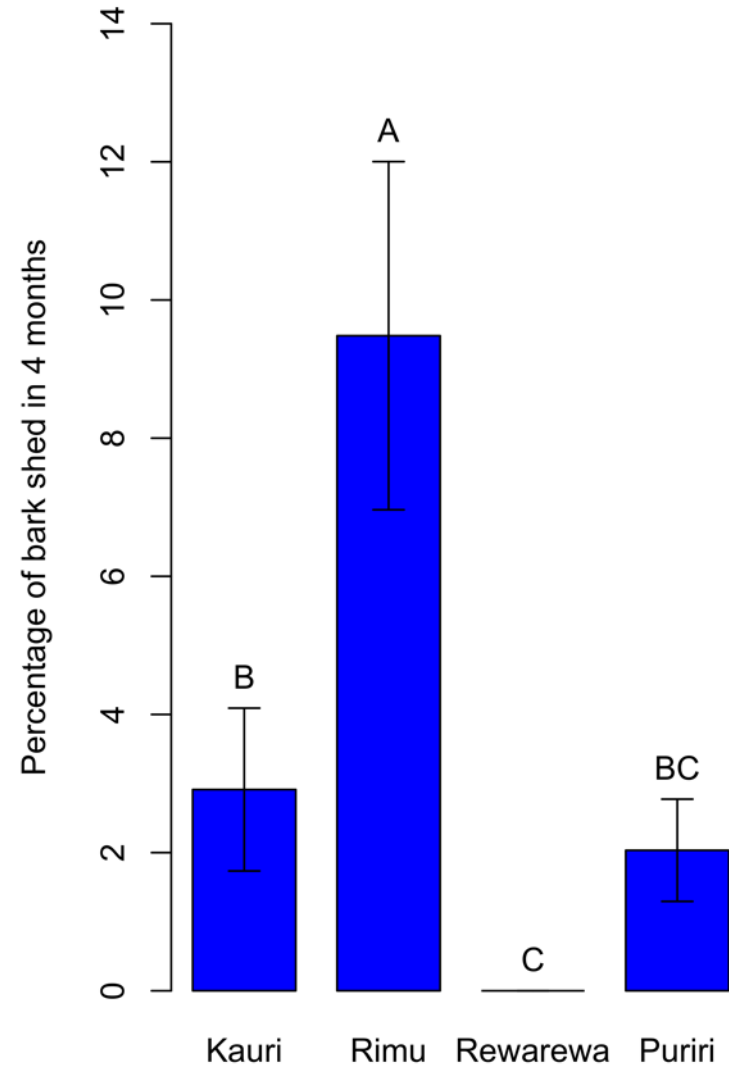
Puriri



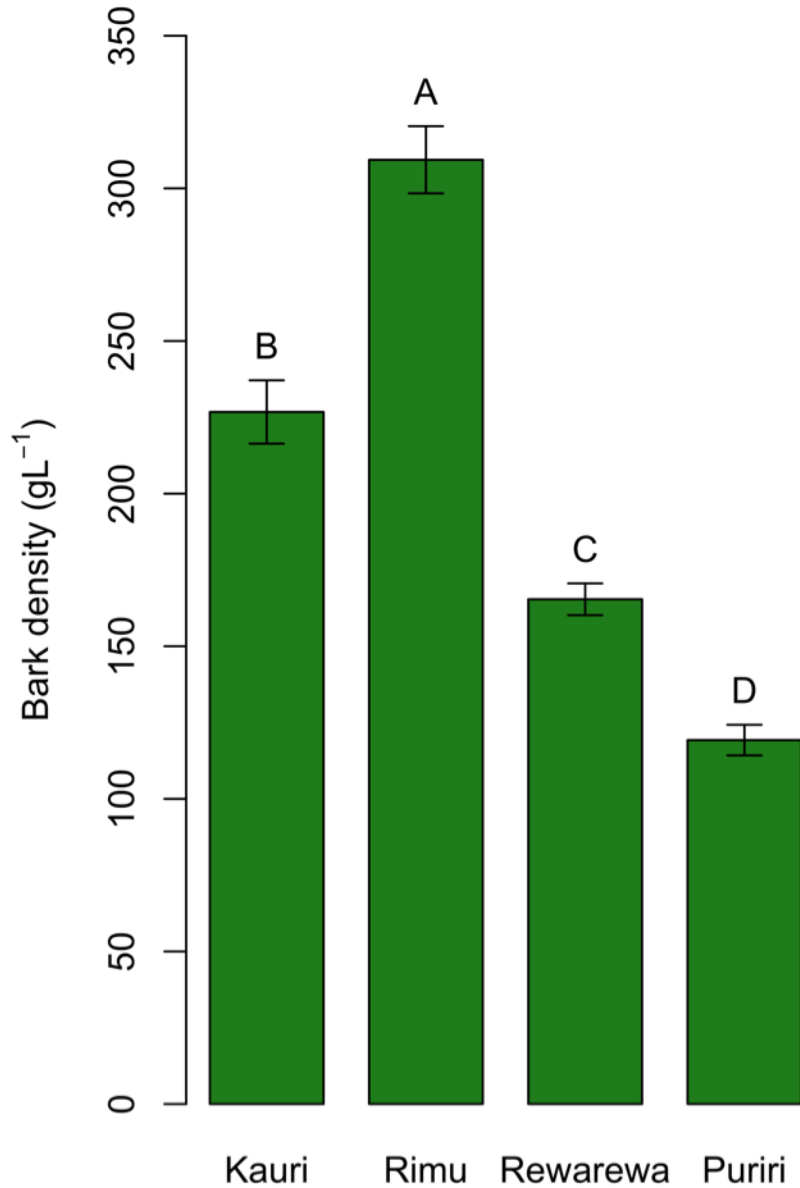
Rimu



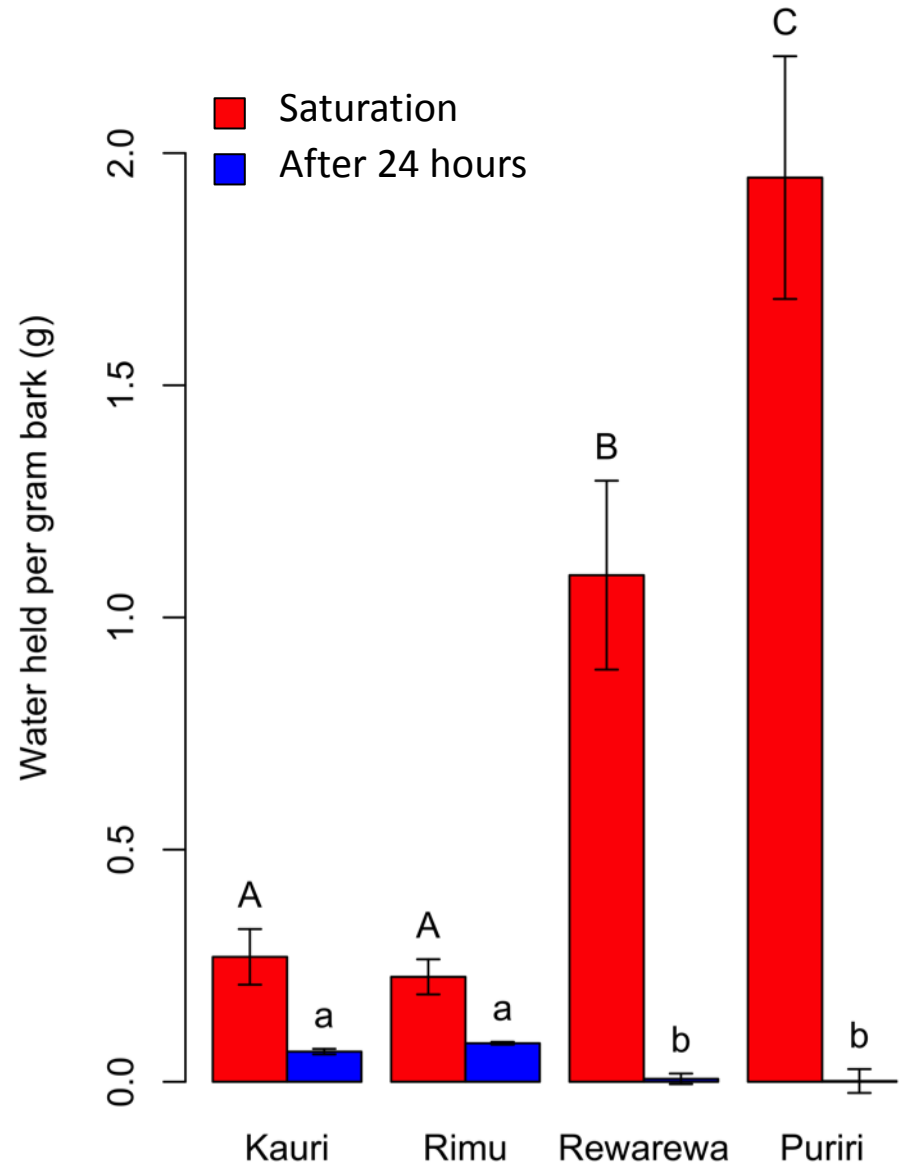
Rewarewa



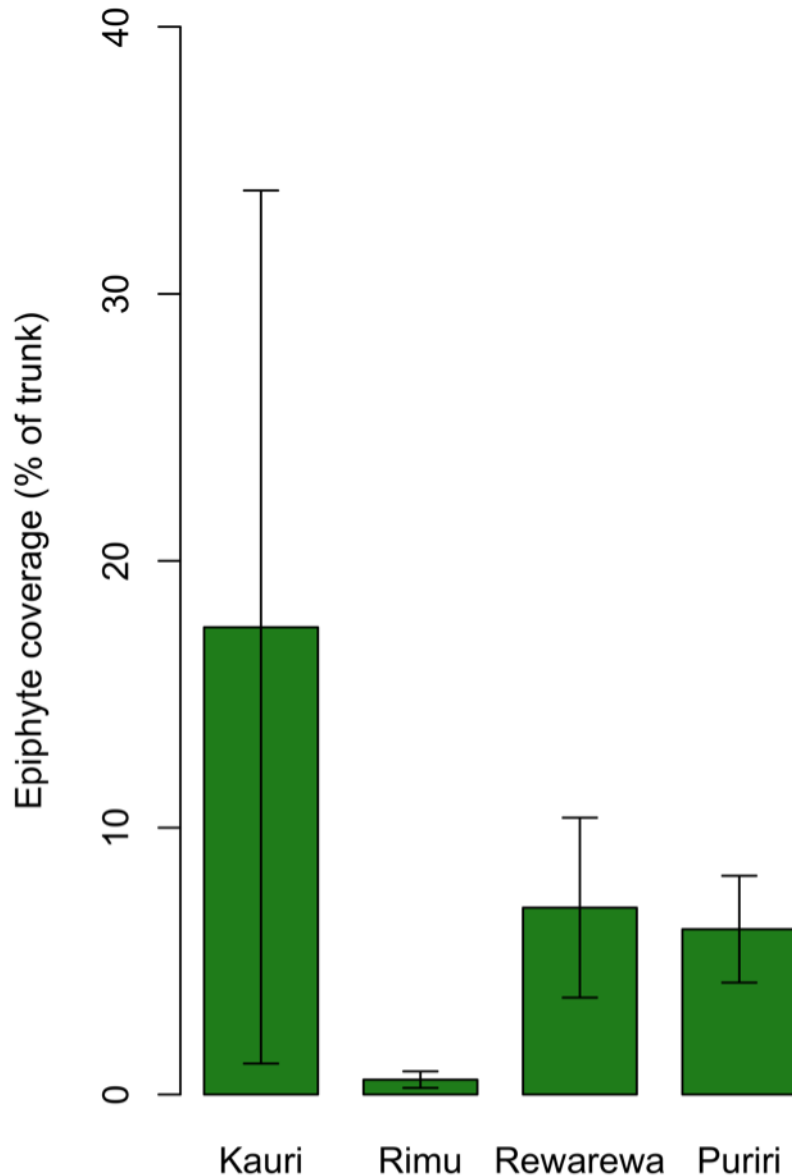
Bark density



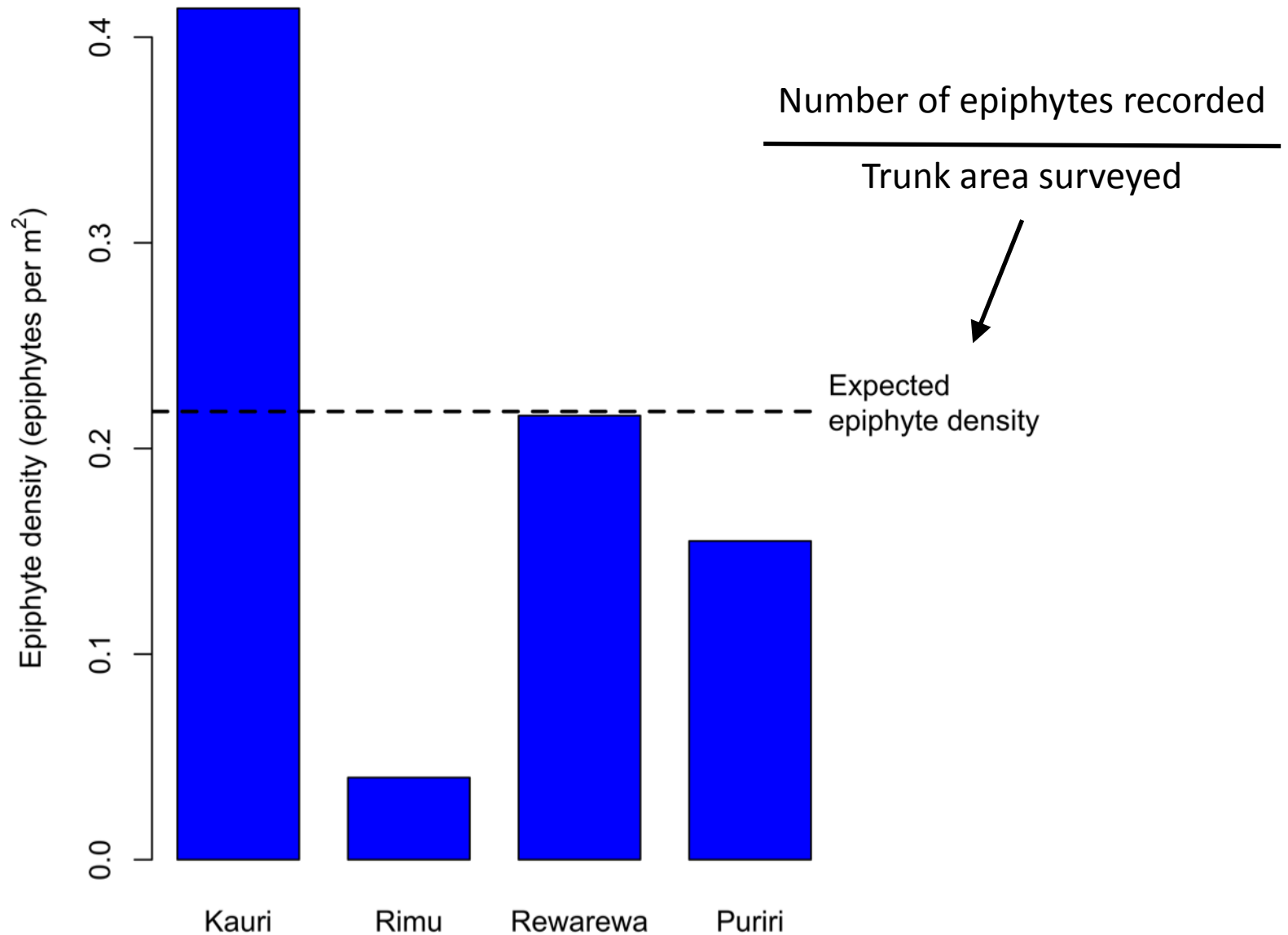
Water holding capacity



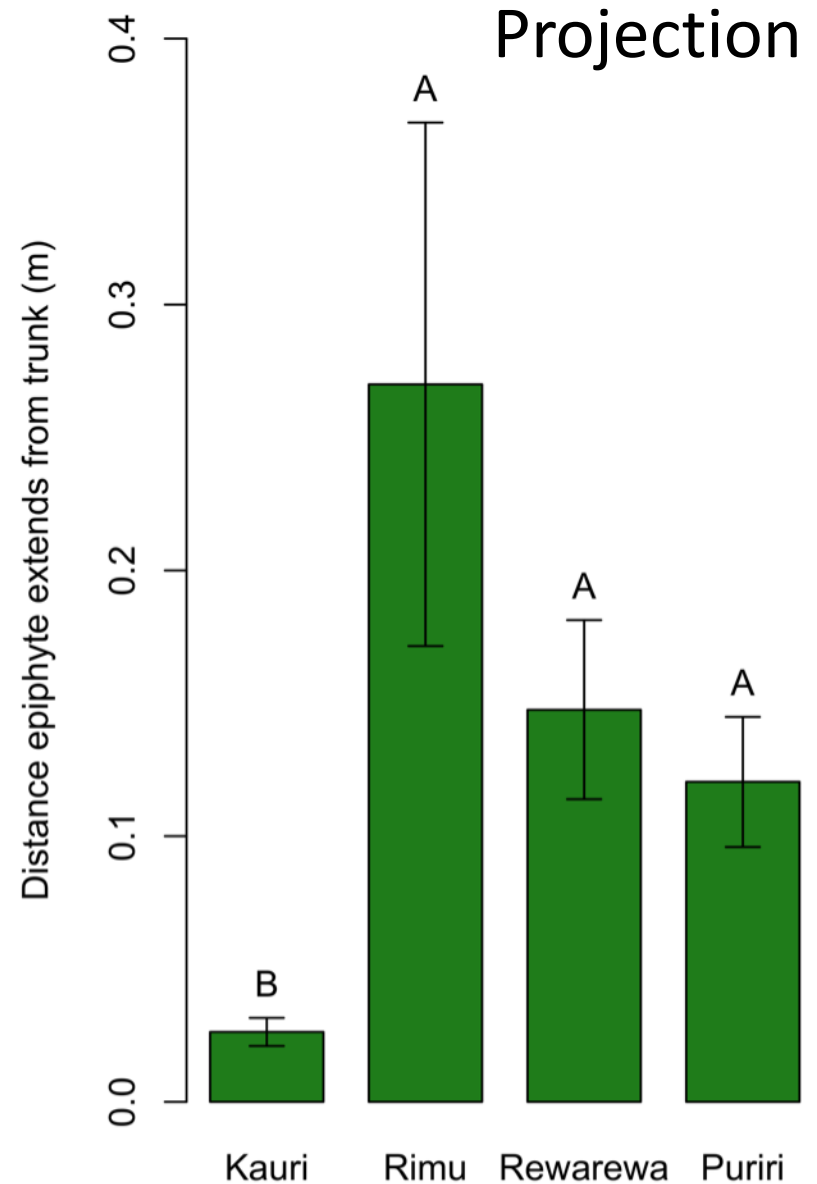
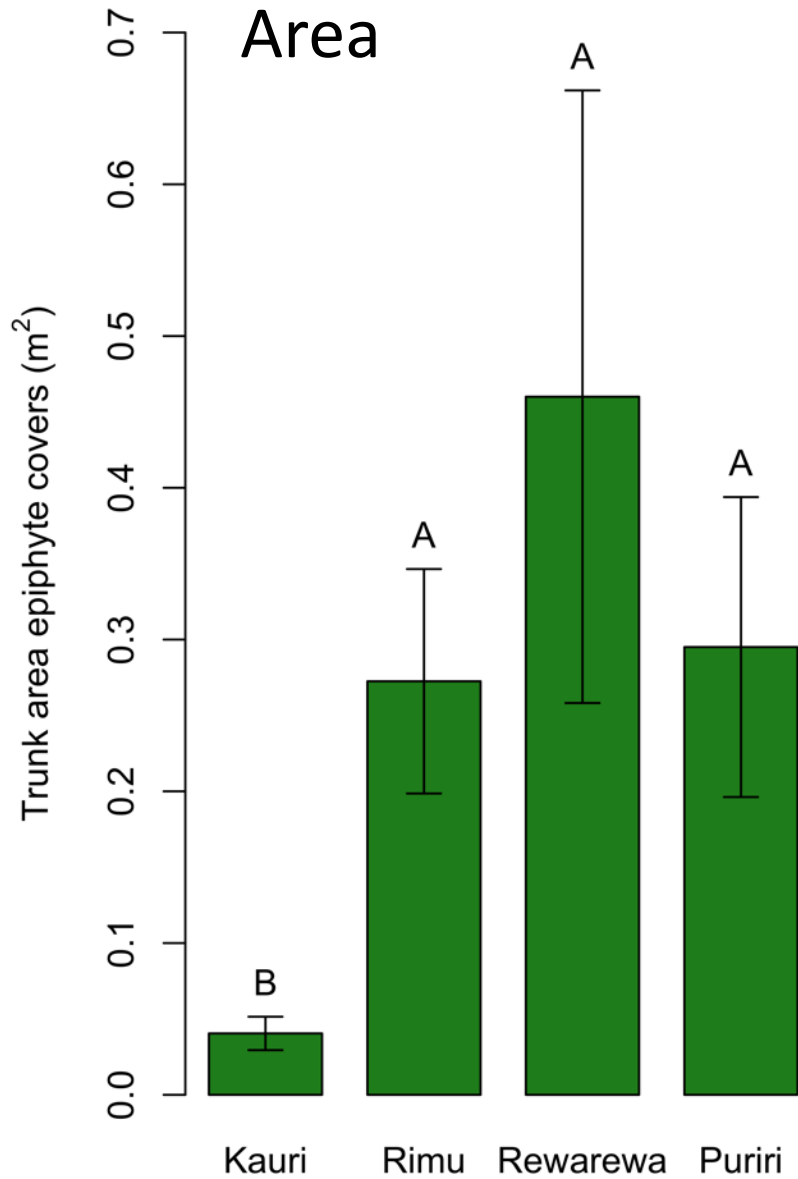
Epiphyte coverage of trunks



Epiphyte densities



Epiphyte size



Species composition - kauri

- Smooth bark and relatively its relatively high shedding rate select for species that grow as flat mats against bark surface
 - E.g. *Ichthyostomum pygmaeum*, *Hymenophyllum* spp.
- Mats fragmented as bark flakes shed



Species composition - rimu

- Very rough bark with high shedding rate made rimu a poor epiphyte host
- Bark chemistry?
- Species that did occur were typically large, with creeping rhizomes
 - E.g. *Microsorium* spp.



Species composition - rewarewa

- Smooth bark allows similar species composition to kauri
- Low shedding rate also allows persistence of larger species, and/or those with single point of attachment
 - E.g. *Drymoanthus adversus*, *Asplenium flaccidum*, *Earina* spp., *Microsorium* spp.



Species composition - puriri

- Intermediate rugosity and shedding rates, and high bark water holding ability = good epiphyte host
- Larger species, both creeping and single point of attachment
 - E.g. *Asplenium flaccidum*, *Microsorium* spp., *Earina* spp.



Conclusions

- Despite shedding, kauri bark **does** host a diverse vascular epiphyte flora, although species composition is distinct from that of other hosts
- Bark traits important in determining composition and abundance of epiphytes
- Bryophytes important in vascular epiphyte establishment