

# Why are there so few endemics in island bryophytes ?

Macaronesian flora answers

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fnrs

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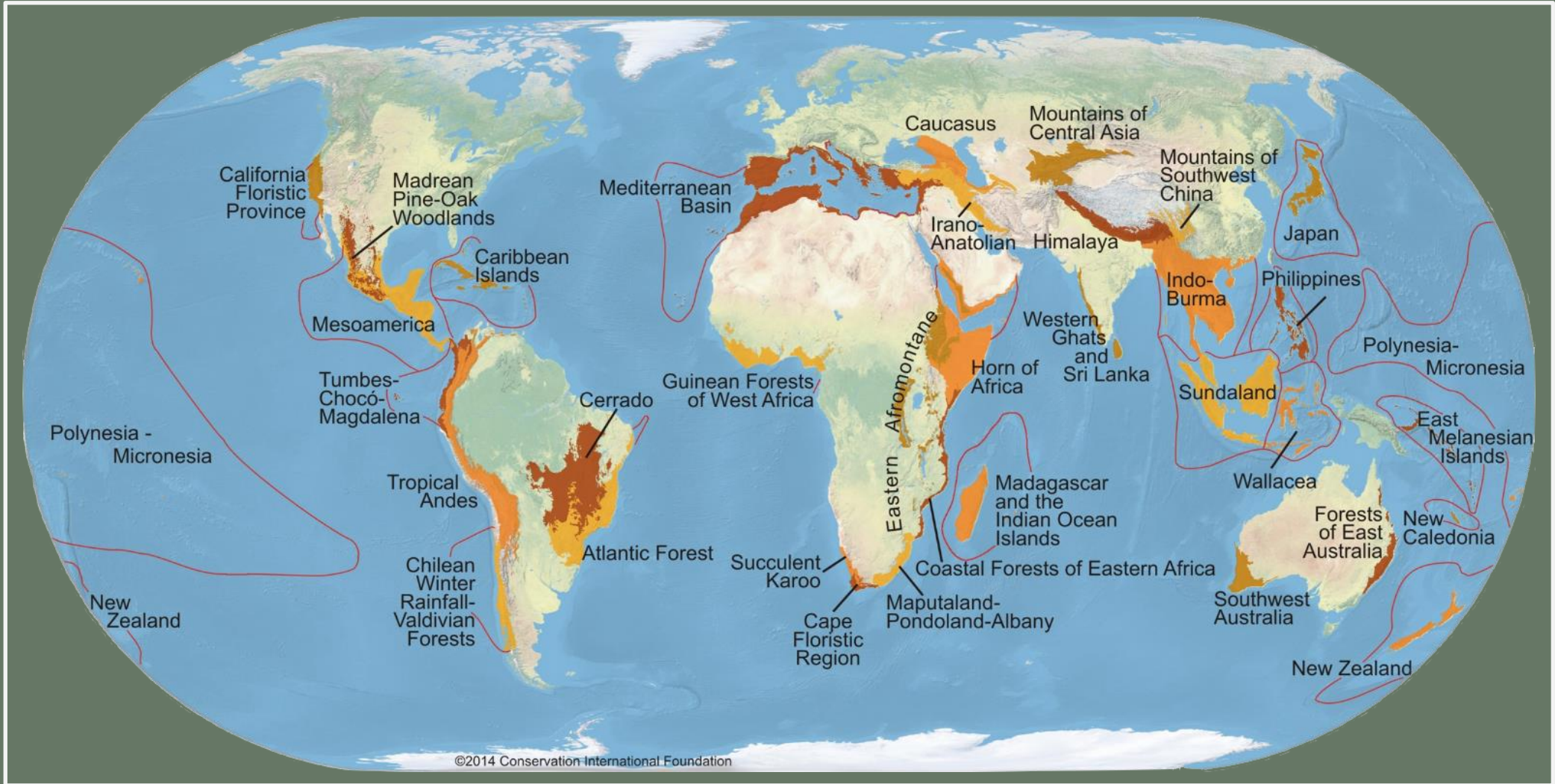
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# Biodiversity Hotspots



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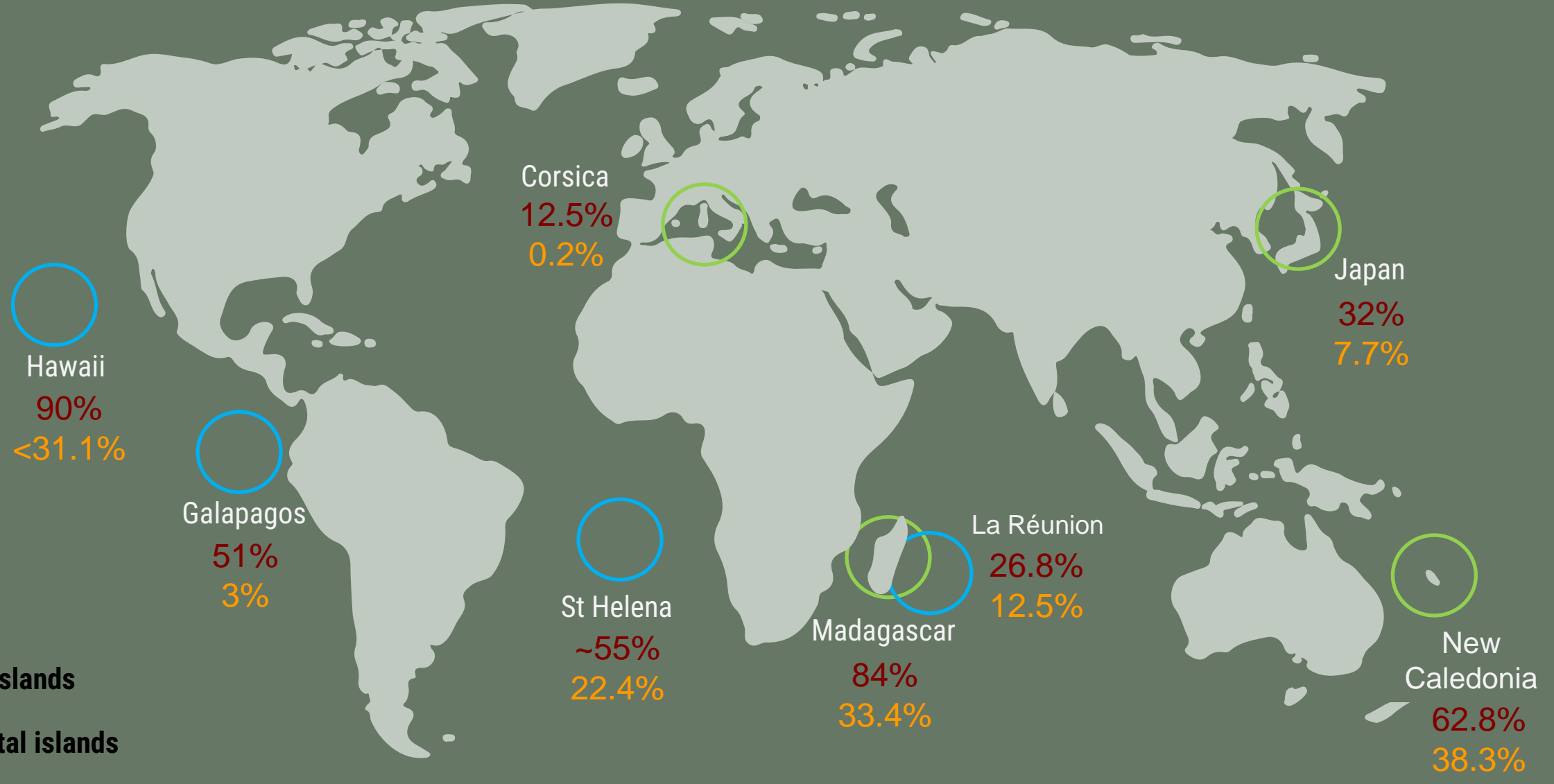
# Endemism patterns



Angiosperms



Mosses

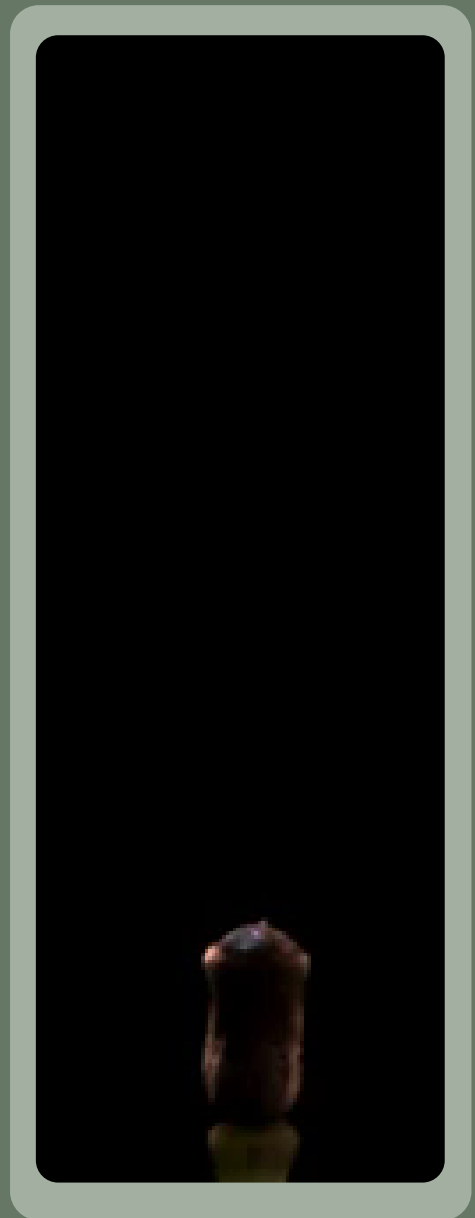
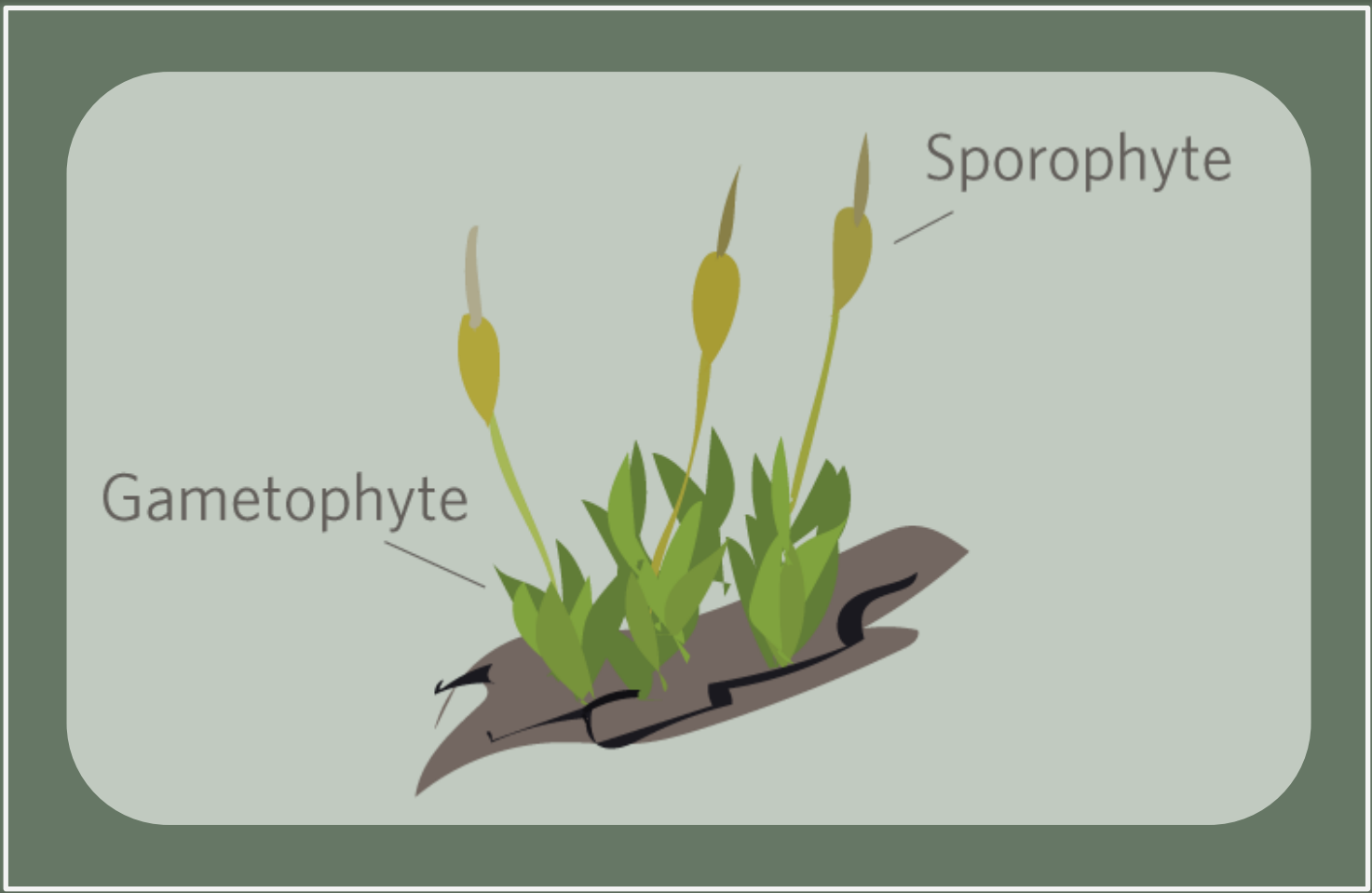


Oceanic islands

Continental islands

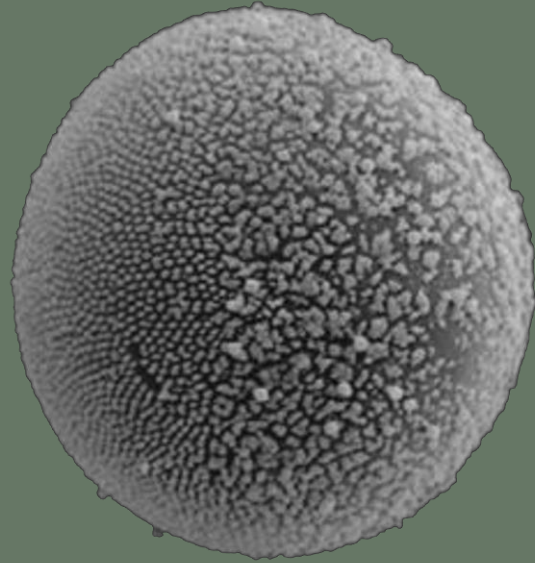


# Bryophytes





# Bryophytes



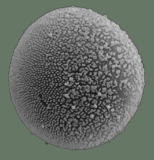
Bryophyte spore  
25 $\mu$ m



# Bryophytes



25 $\mu$ m



Orchid seed  
250 $\mu$ m





# Bryophytes

Wheat seed

8mm  
(8000 $\mu$ m)



250 $\mu$ m







# Bryophytes

8mm  
(8000 $\mu$ m)



Coconut seed  
17cm  
(170.000 $\mu$ m)





# Macaronesia





# Macaronesia





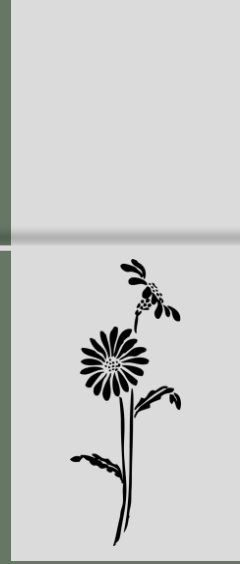
# Macaronesian endemics



*Gonospermum revolutum*



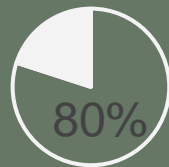
*Acrobolbus madeirensis*



Endemic species

47.7%

Mediterranean  
affinities for endemics



Radiations



Endemic species

7.2%  
(Mosses)

Neotropical affinities  
for endemics



No radiation





## Why a low bryophyte endemism?

### H1

- a) Intense gene flow between island and continent
- b) Endemics from LDD

### H2

Endemics back-colonized the continent

### META-ANALYSIS

Descriptive population genetics	H1a
Phylogenies and Ancestral Range Estimation	H1b
ABC analyses in a coalescence framework	H2

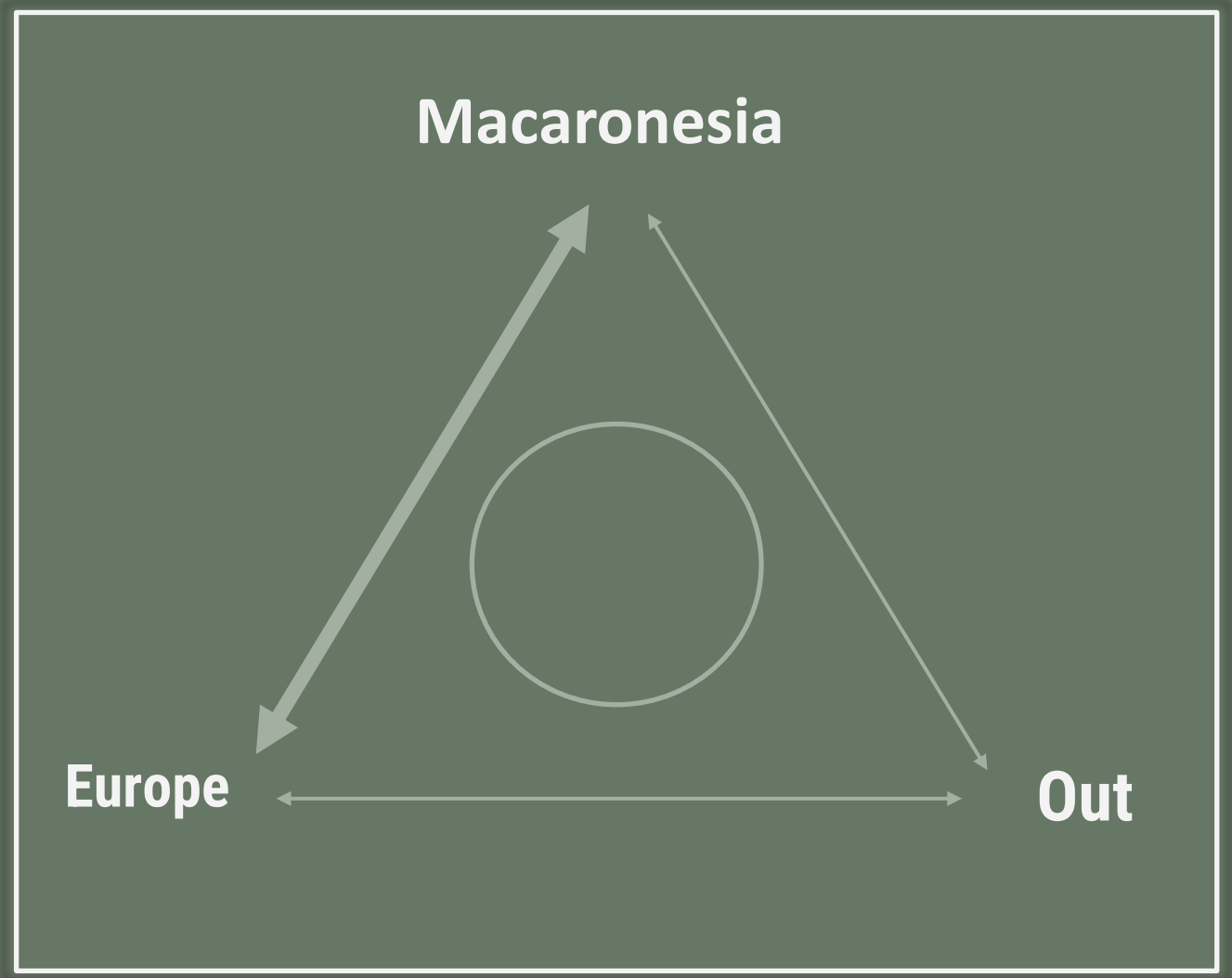


# H1 - Gene flow

Fst

Expectations

Europe = Macaronesia ≠ Out





# H1 - Gene flow

Fst

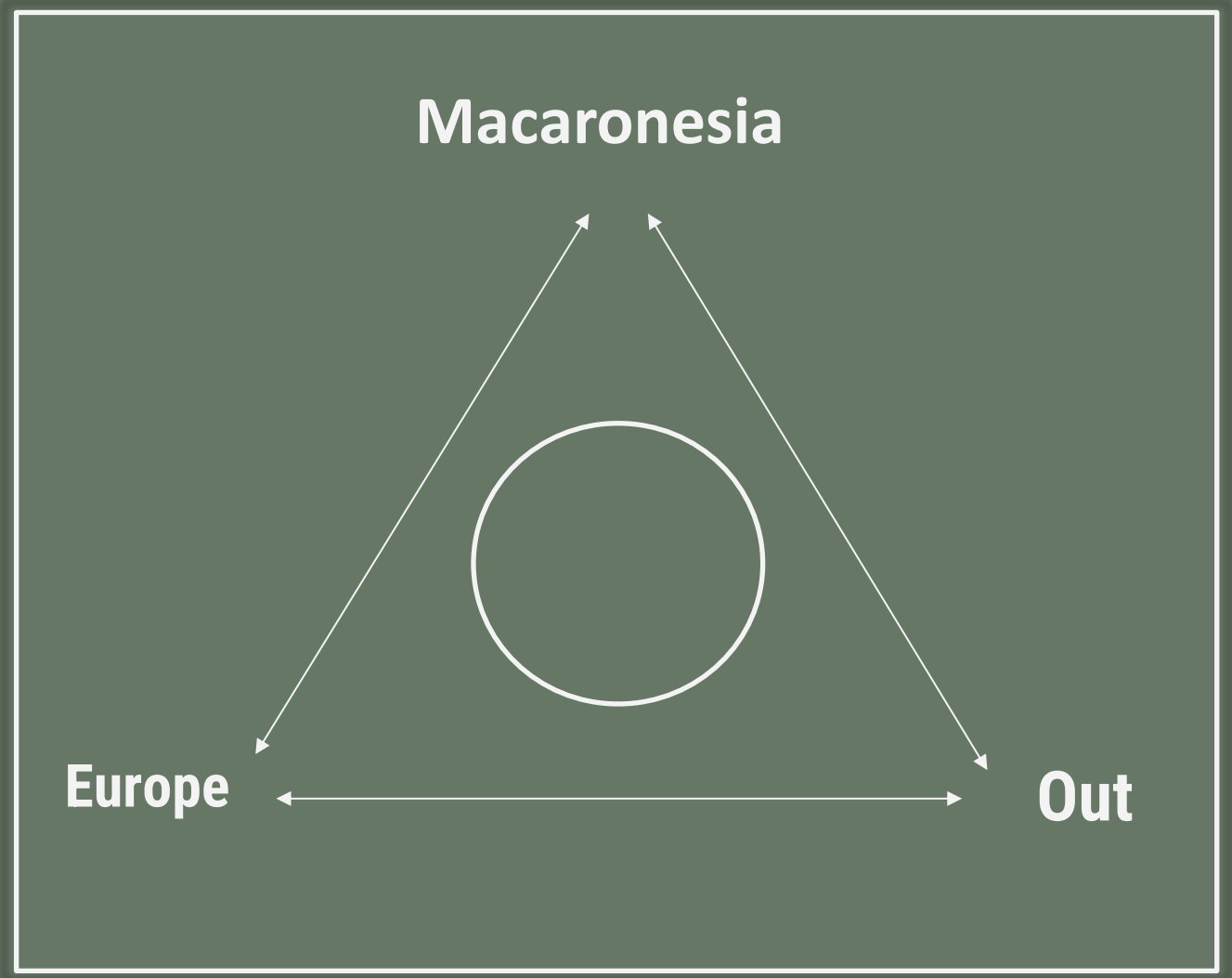
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Expectations

Europe = Macaronesia ≠ Out

Reality

Europe ≠ Macaronesia ≠ Out





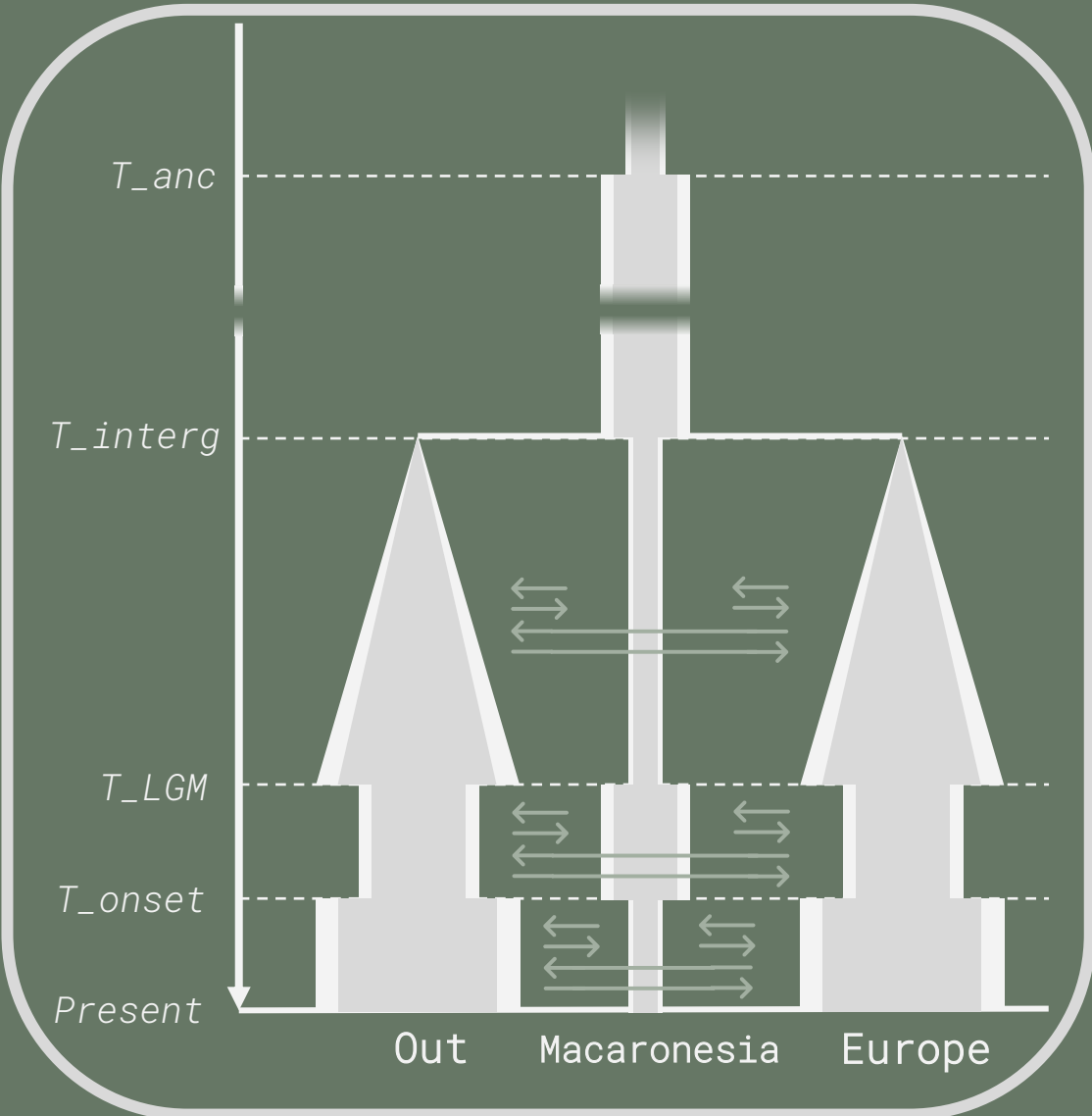


## 17 endemic species

- 5 non-informative
- 4 double origin



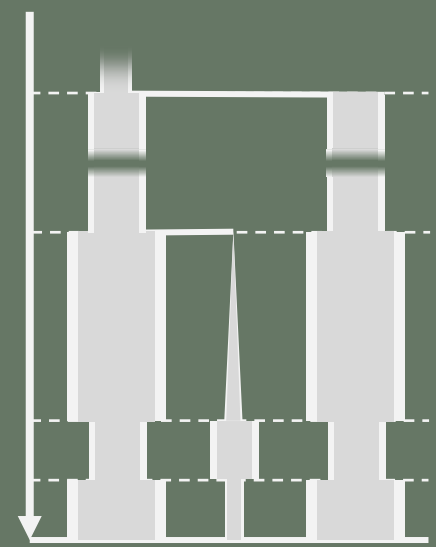
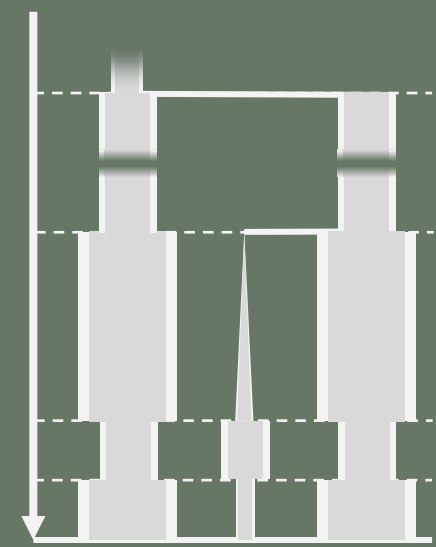
# H2 – Back colonization



12 scenarios

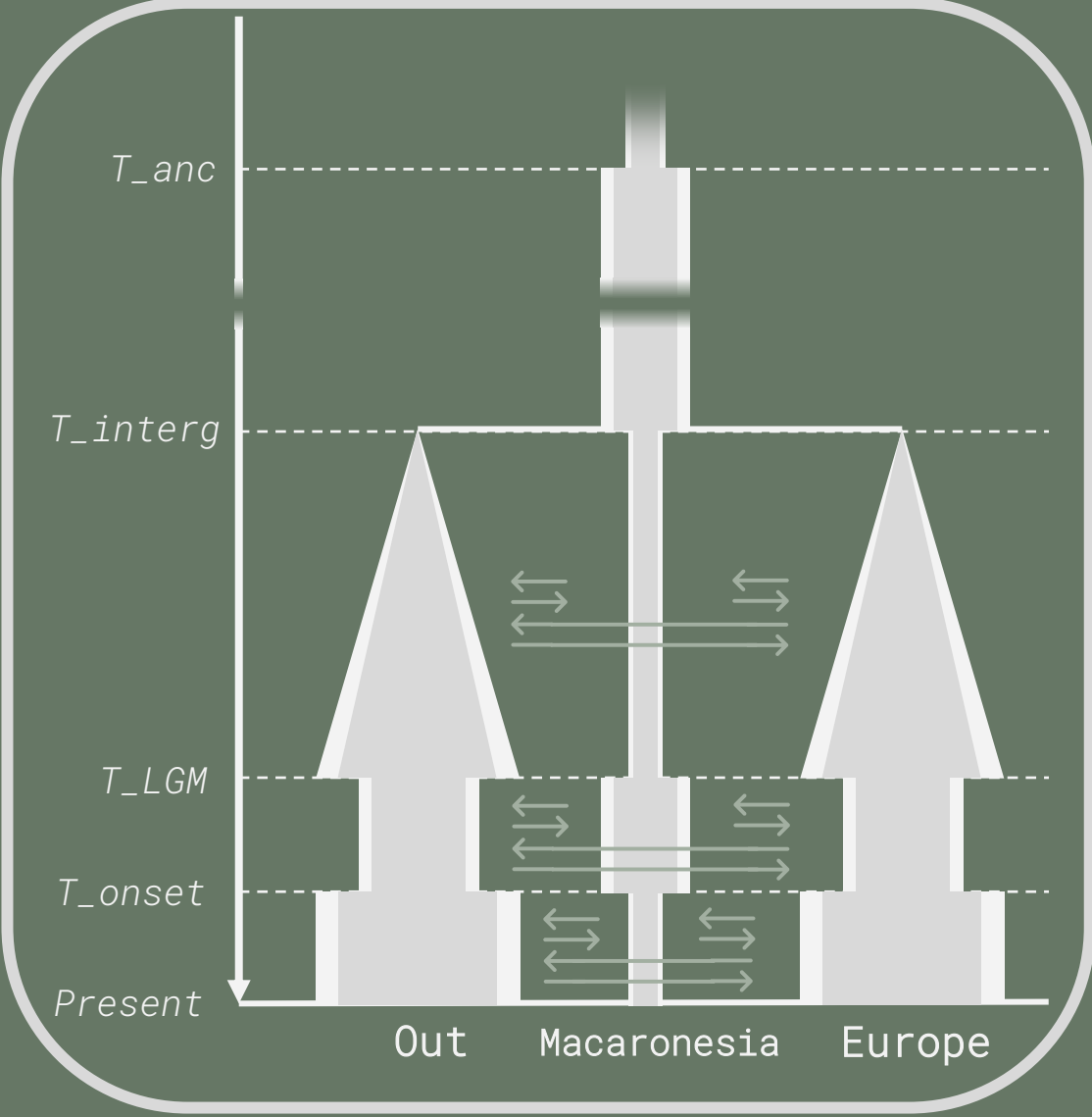
1.000.000 simulations

10 species



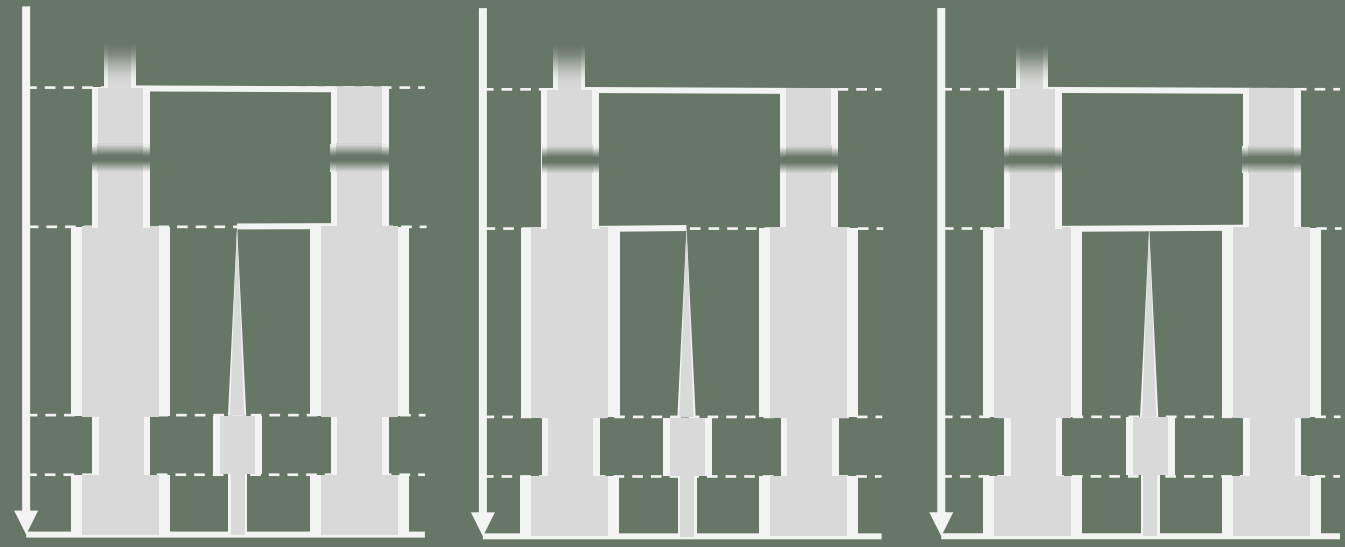


# H2 – Back colonization



5/10

Back-colonization  
Macaronesian origin







# Stepping Stone





# Stepping Stone



# Stepping Stone



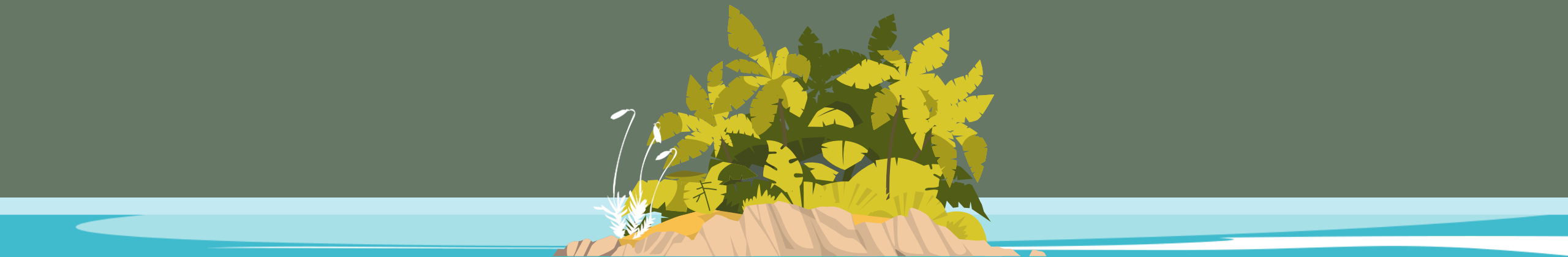
*Bryoxiphium norvegicum*







# Stepping Stone

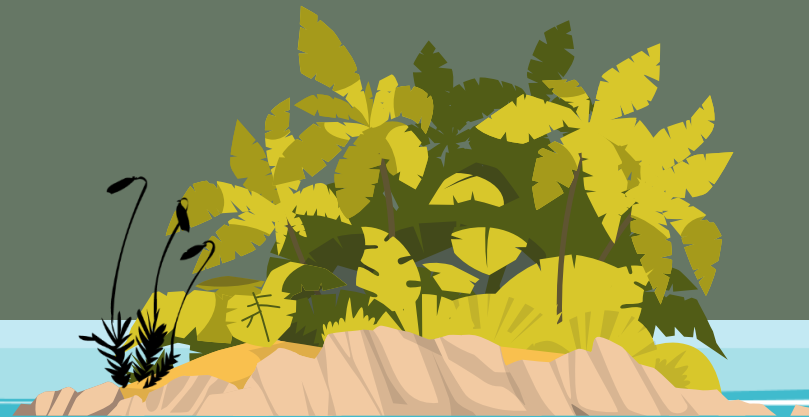




# Stepping Stone



*Acrobolbus madeirensis*





# Stepping Stone





# Stepping Stone



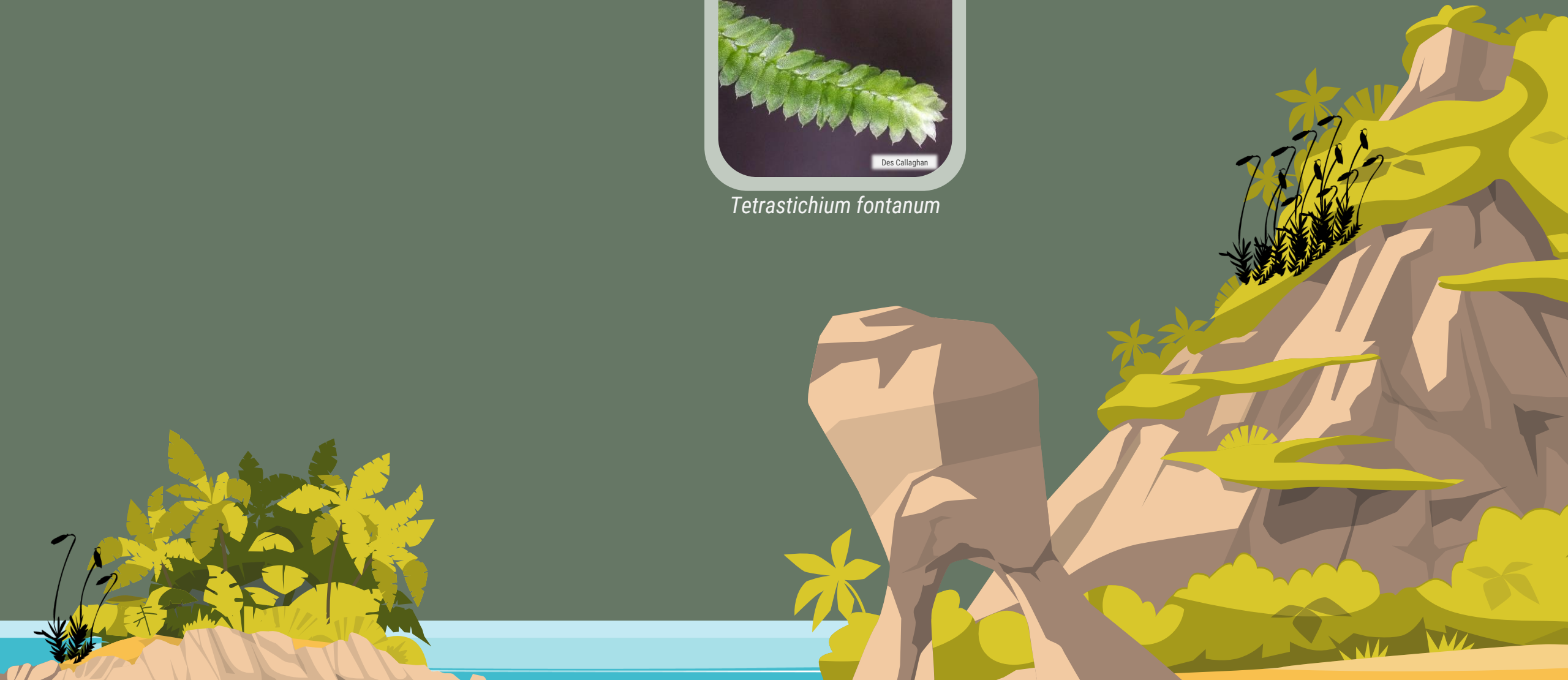




# Stepping Stone



*Tetrastichium fontanum*





# Stepping Stone





THANK YOU

Do you have any questions?



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