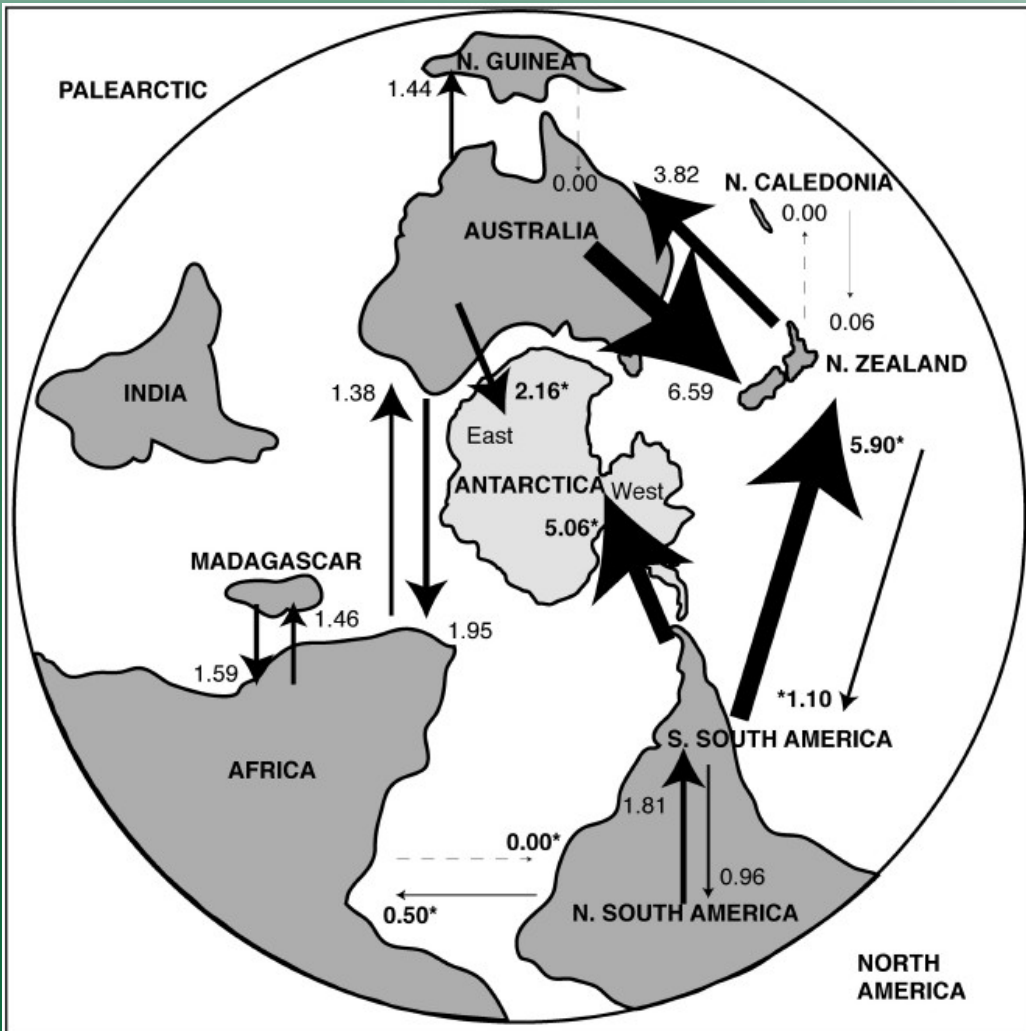


# Radiation of the schoenoid sedges

J Viljoen, AM Muasya, JJ Bruhl,  
AK Gibbs, KL Wilson, GA Verboom



# *Austral biogeography*



- Hooker 1853: Antarctic element
- Morrone 2002: Austral Floristic Kingdom
- Gondwanan vicariance (Raven & Axelrod 1974)



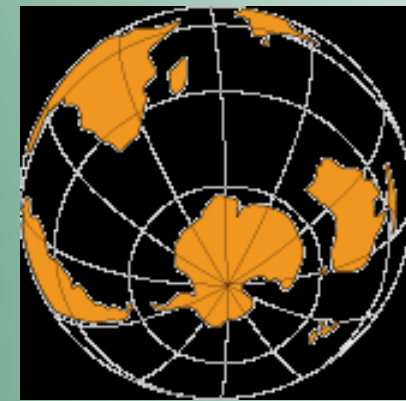
# *Cyperaceae (sedges)*



Crown age: 75 Mya  
(Besnard et al. 2009)

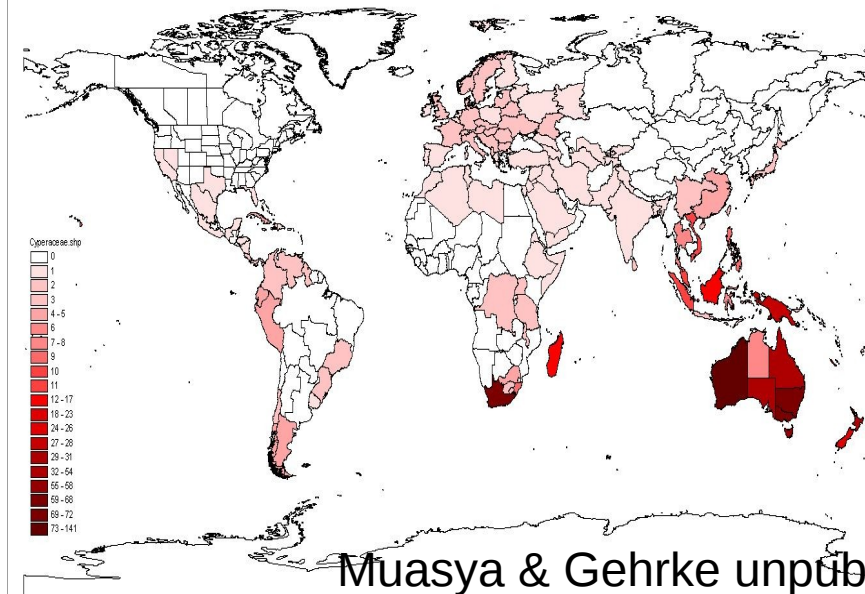


120 Mya

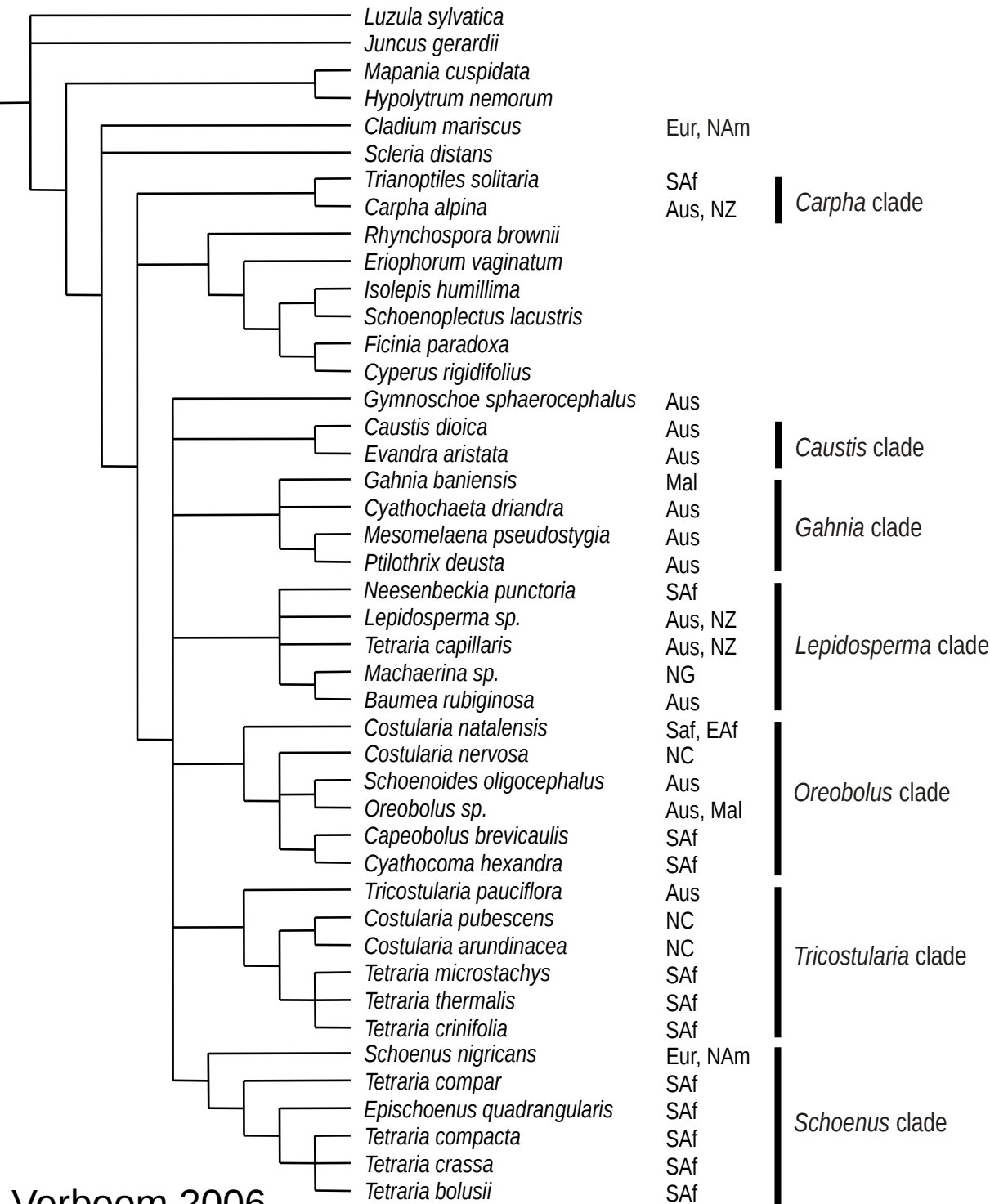


40 Mya

# Schoeneae



Muasya & Gehrke unpub.



Verboom 2006

# Questions

- Are the clades robust?
- What are the relationships between them?

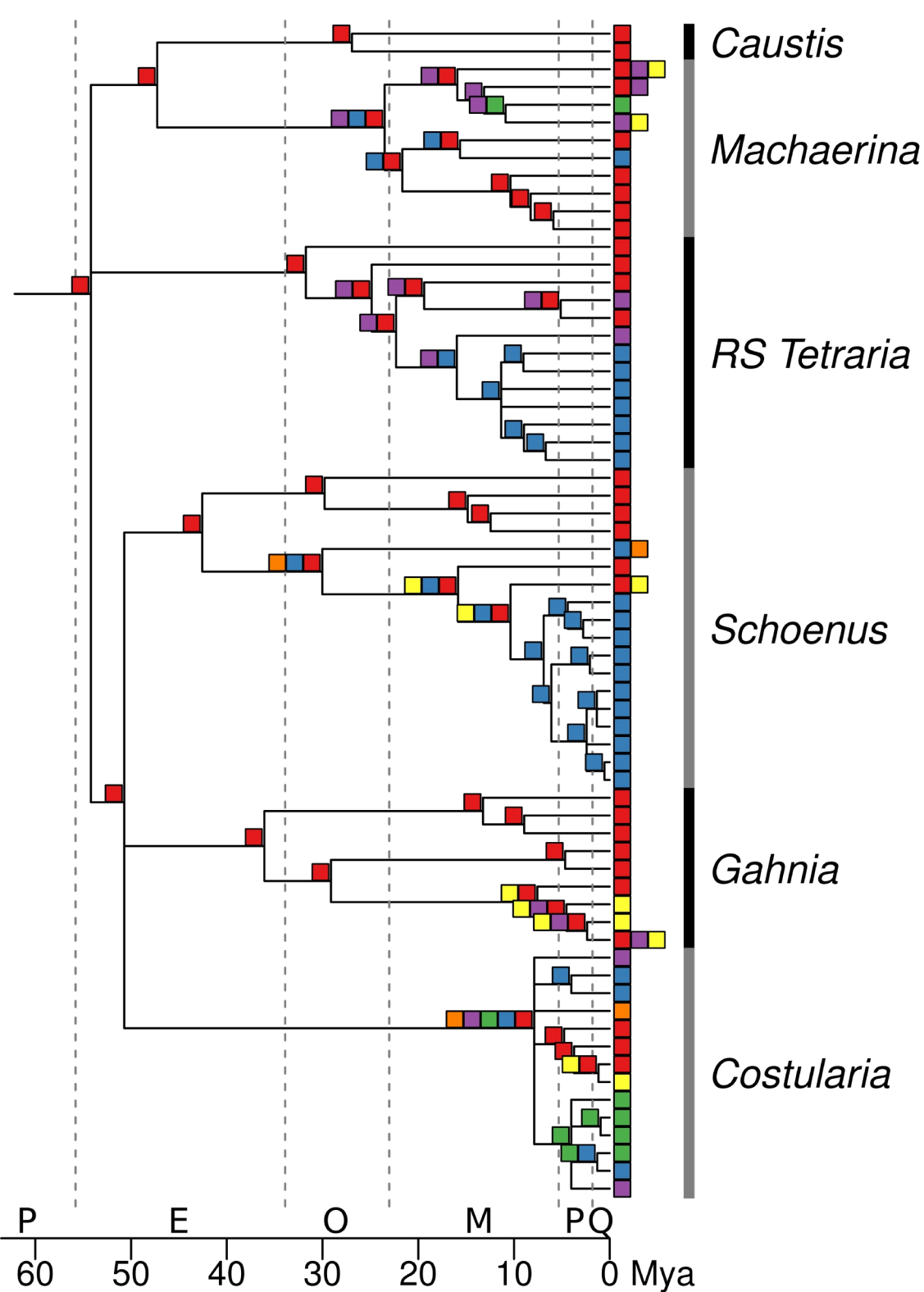


# Questions

- Did the lineages diverge allopatrically?
- When did this radiation take place?



# Ancestral area



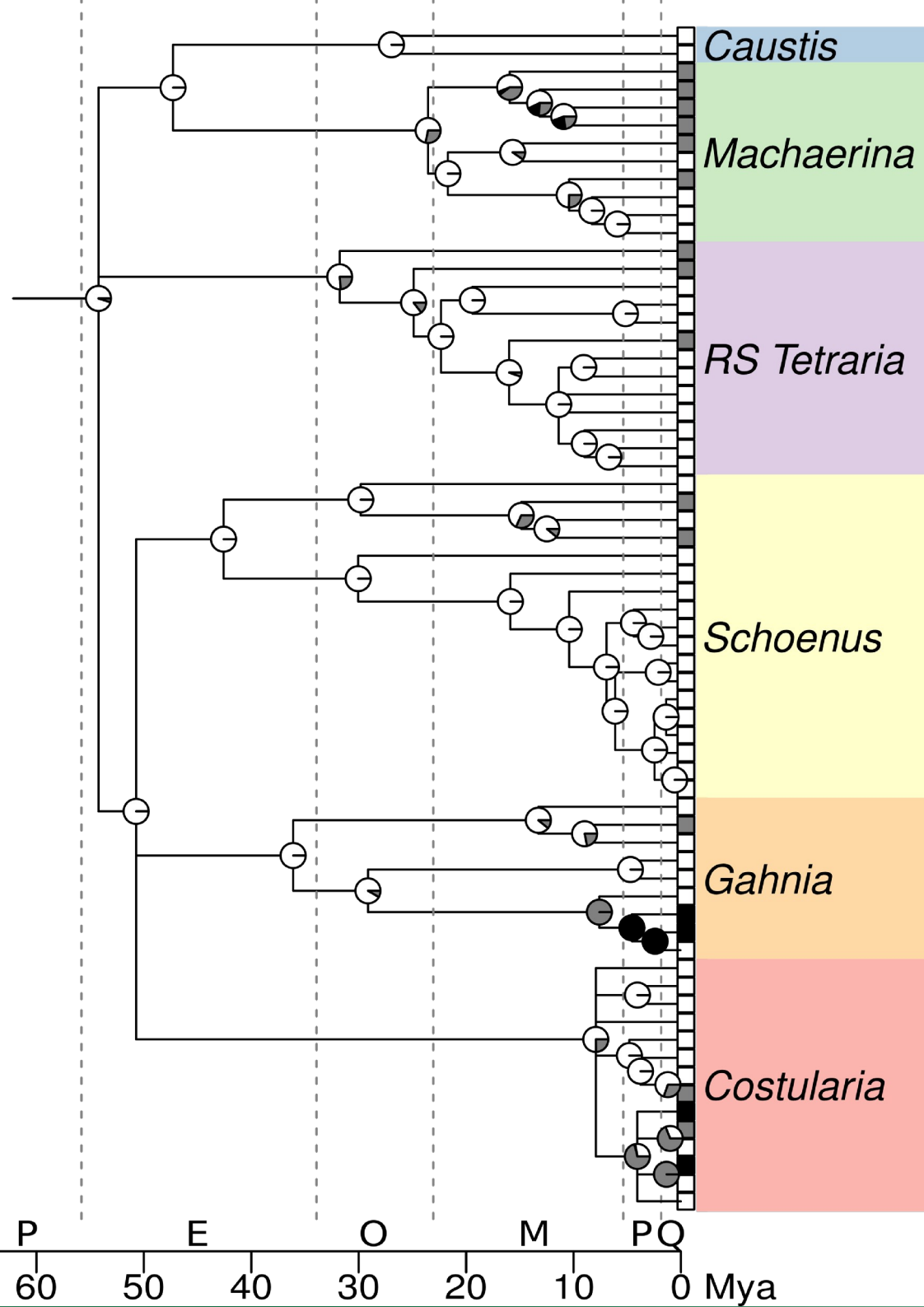
- Australian ancestor
- Radiation *within* Australia during Eocene
- Dispersal to Papuasia & Malesia, New Caledonia, Madagascar, Cape during Oligocene & Miocene



# *Question*

- Was the radiation associated with ecological divergence?

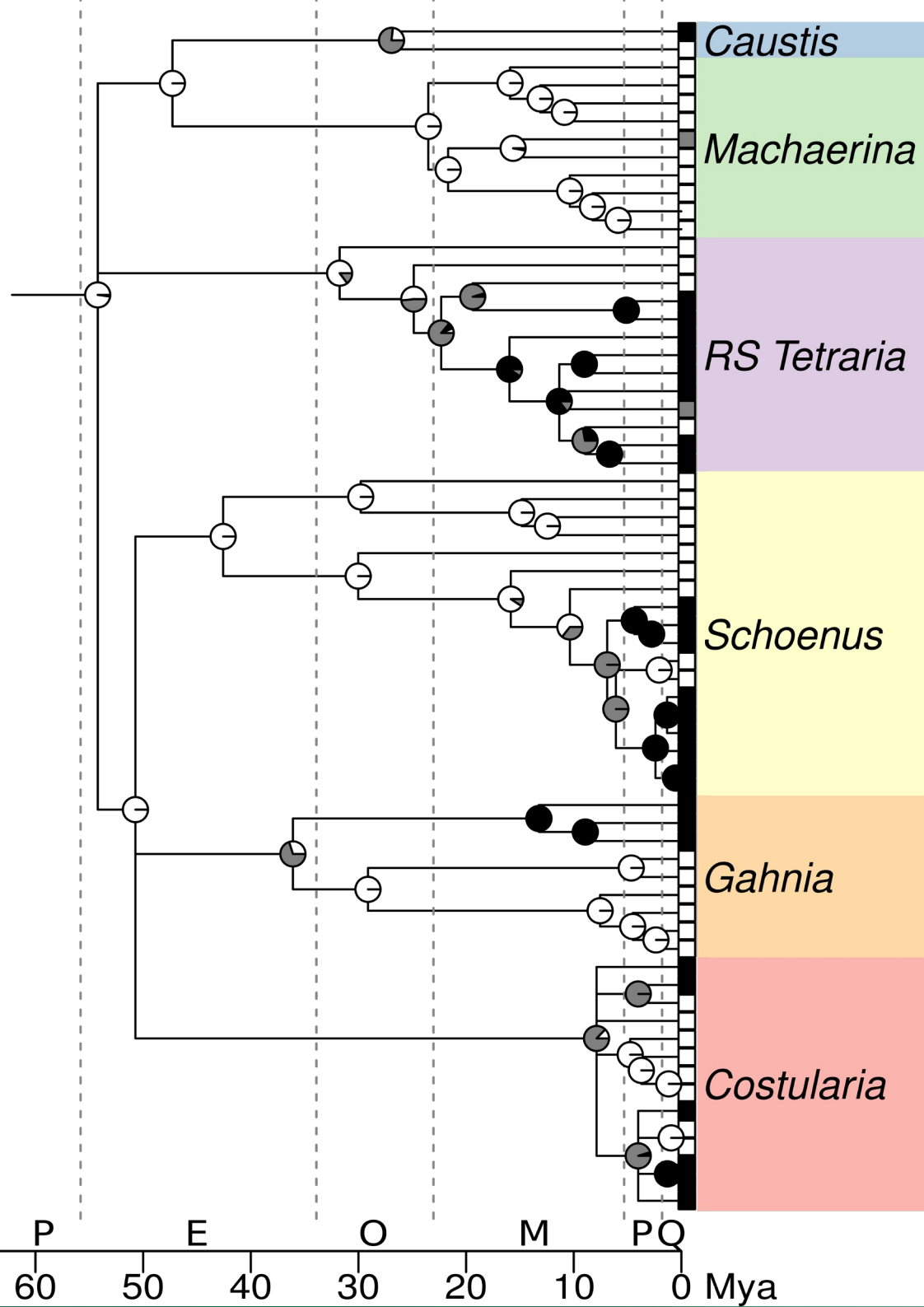
# Ancestral habitat



- Ancestor of Schoeneae *and* of six lineages in **open** vegetation
- Shade adaptation in last 10 My

□ Open  
■ Forest  
■ Both

# Ancestral habitat



- Ancestor of Schoeneae *and* of six lineages in **wet** habitats
- Drought adaptation in last 25 My

□ Wet  
■ Dry  
■ Both

# Conclusions

- Are the clades robust?

*Monophyly of Schoeneae & subclades confirmed*

- What are the relationships between them?

*“Hard” polytomy*

- Timing of divergence?

*Initial split during Eocene*

*Dispersal to other continents from Oligocene onwards*

# Conclusions

- Did the lineages diverge allopatrically?

*No, split within the ancestral region (Australia)*

- Was the radiation associated with ecological divergence?

*No evidence from openness and wetness of habitat:*

*Shifts out of ancestral open, wet habitat starting in Miocene*

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