



Molecular clock estimation of divergence times in populations of *Oikopleura dioica*

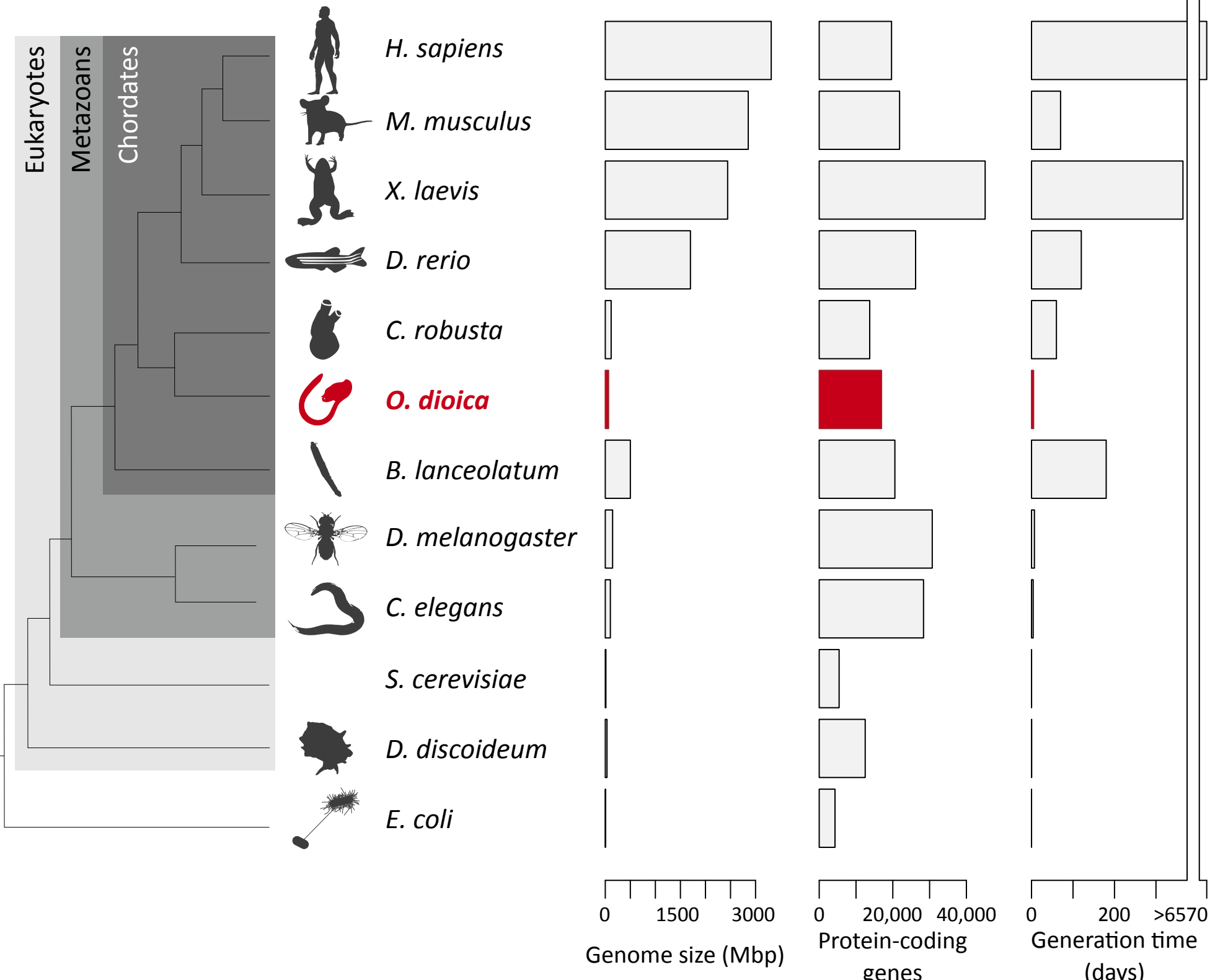
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BACKGROUND

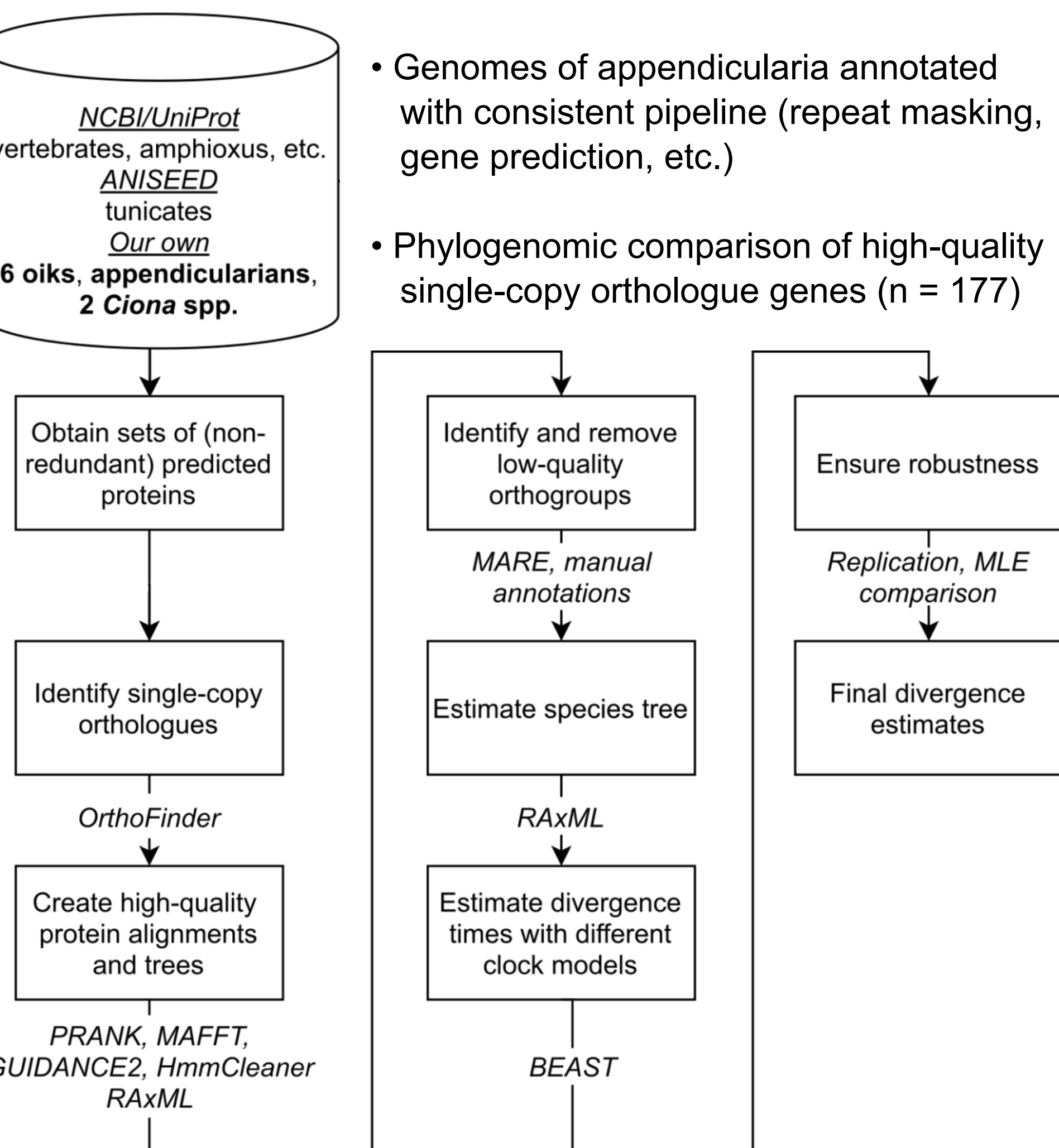
- Tunicates, a sister clade of the vertebrates, are often sessile and sometimes colonial filter-feeding marine animals
- O. dioica* is a solitary planktonic tunicate in class Appendicularia
- O. dioica* as species typified by dioecy alone, but species is found globally
- Global genetic diversity unknown; heterozygosity and substitution rate high in Atlantic population¹
- Marked gene loss occurred among the Tunicates - and *O. dioica* has lost critical DNA repair pathways and genes
- Fast life cycle (~5d), substitution rate imply fast molecular clock



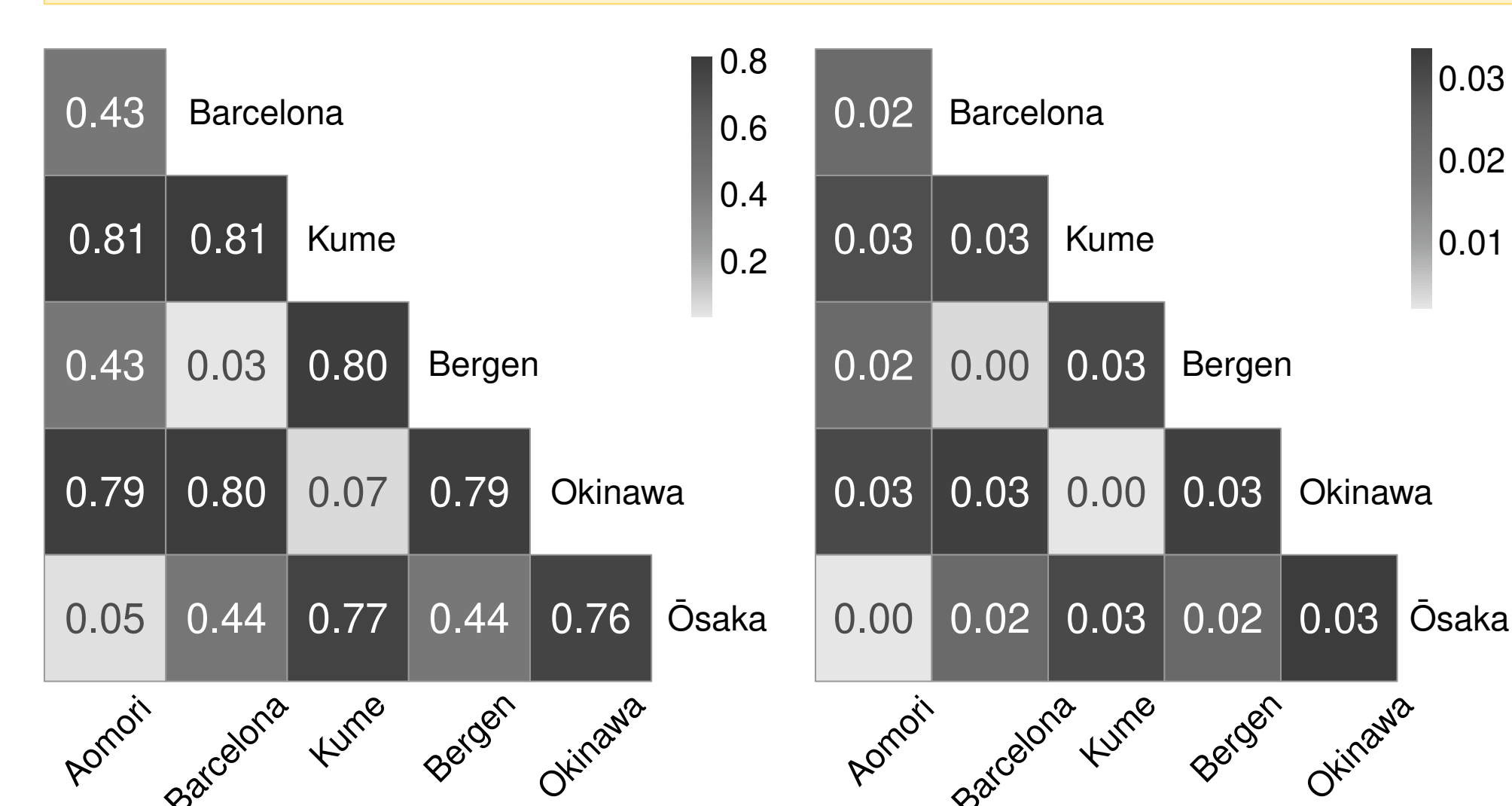
OBJECTIVES

- Compare *O. dioica* from Atlantic (Barcelona, Bergen), North Pacific (Ōsaka², Aomori), and Ryūkyū (Okinawa³, Kume) pop'n's
- Estimate divergence times of *Oikopleura* spp.

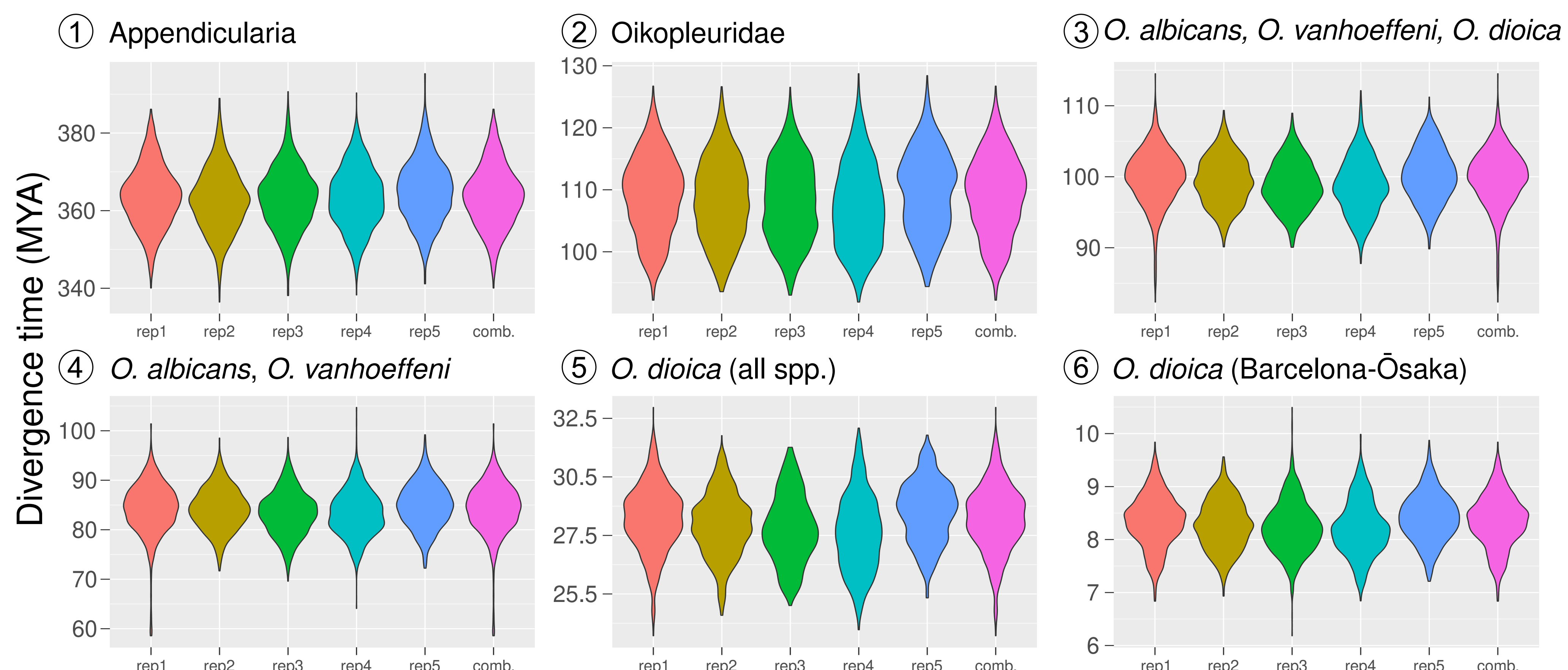
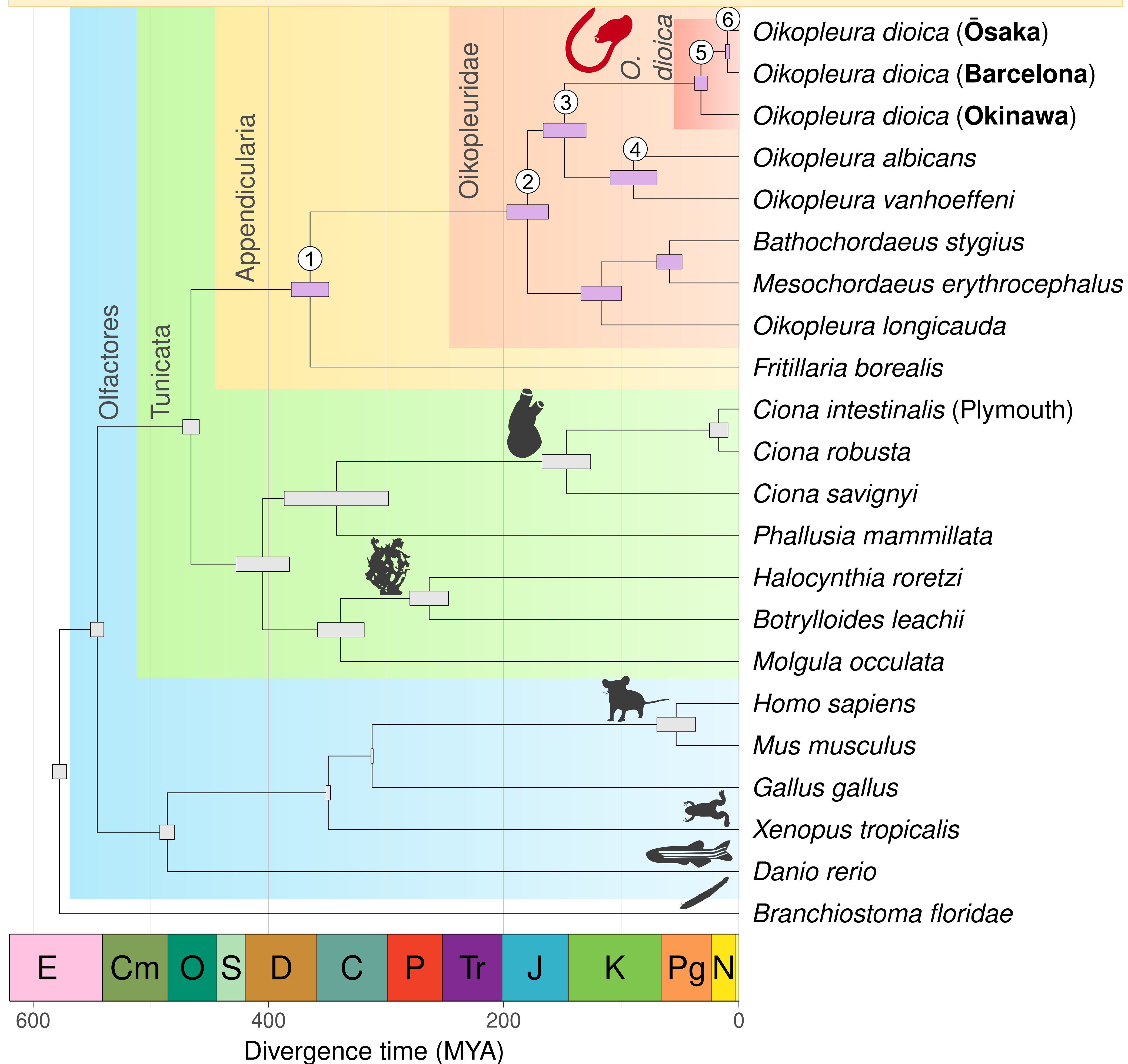
METHODS



Substitution rate estimation



Molecular clock divergence estimates of the Appendicularia



- Estimates stable between replicates (left)
- Evolutionary rates high in appendicularia (right)

Conclusions

- O. dioica* pop'n's from Atlantic and Pacific diverged >25 MYA
- Ryūkyū clade divergent (Barcelona-Ōsaka < 10 MYA)
- Fast clock suggests diversity remains to be discovered
- Lack of fossils from soft-bodied animals complicates clock estimation - but improved taxon sampling may help

References & Acknowledgments

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 - Bliznina, Aleksandra, et al. "Telomere-to-telomere assembly of the genome of an individual *Oikopleura dioica* from Okinawa using Nanopore-based sequencing." *BMC genomics* 22.1 (2021): 1-18.
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