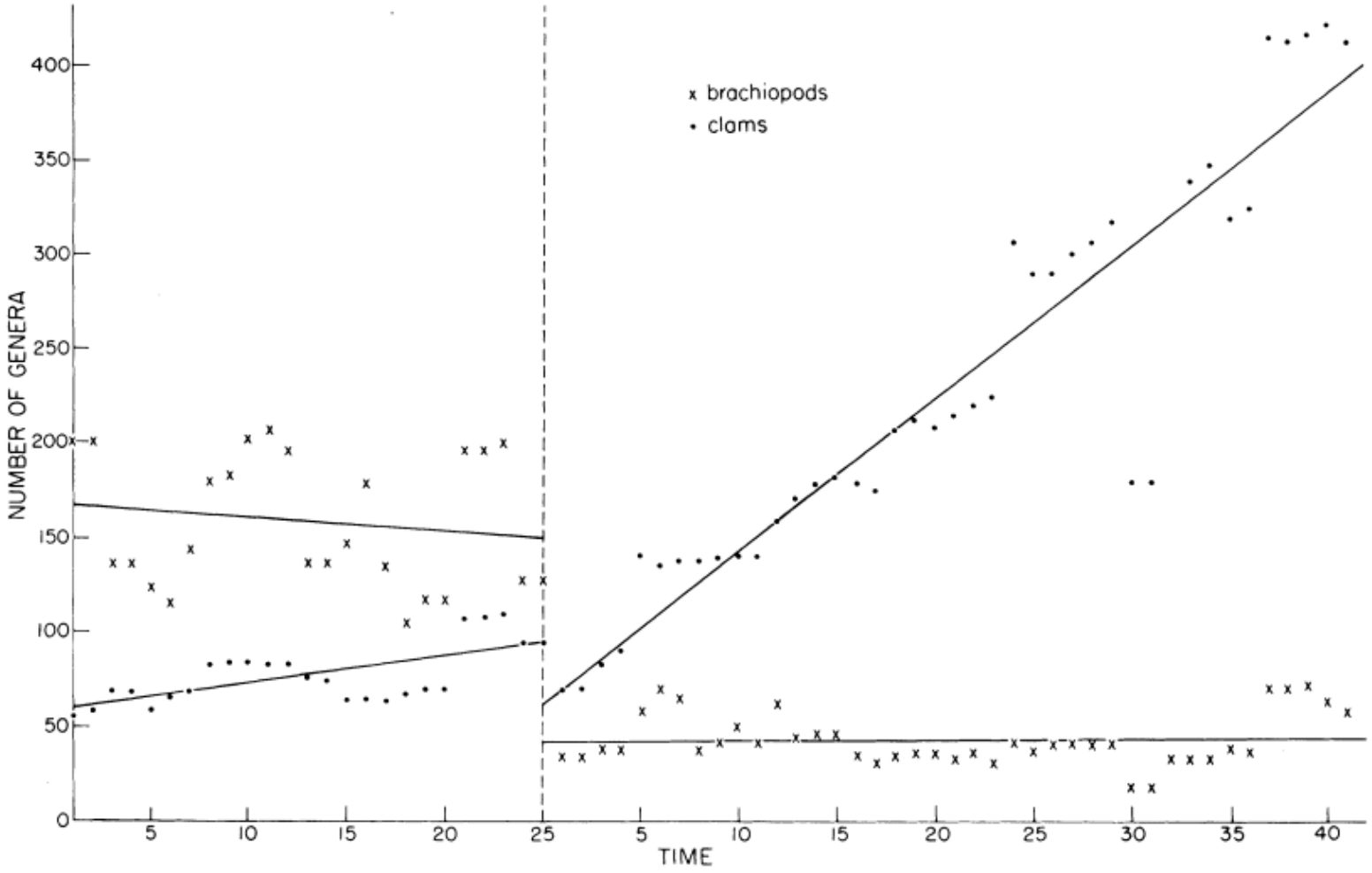
Phanerozoic scale modulation of brachiopod longitudinal expansion fitness forced by plate tectonics

Andrej Spiridonov, Lauras Balakauskas, Shaun Lovejoy

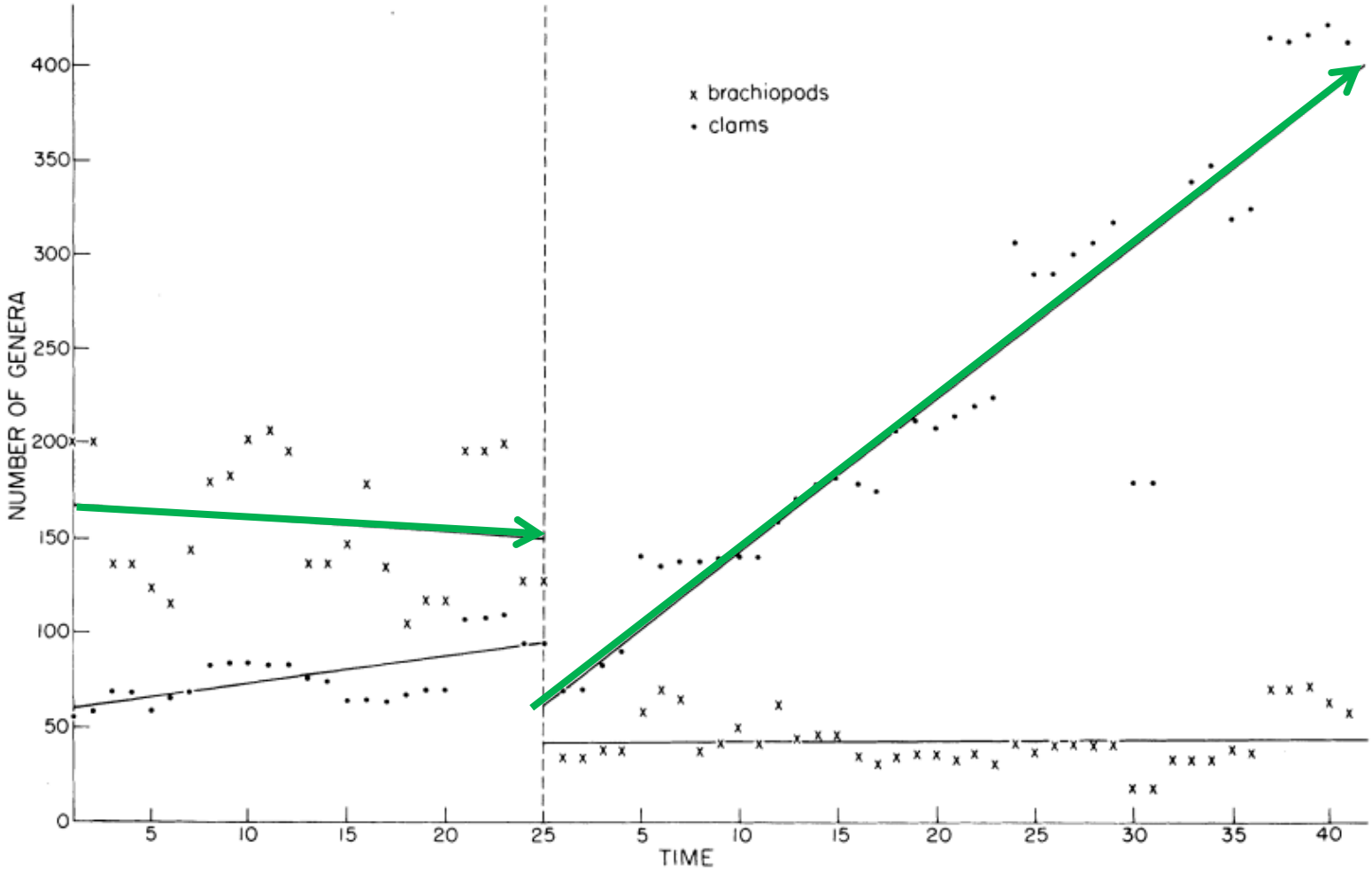
Vienna, 2022

Brachiopods – once thriving and now fallen phylum



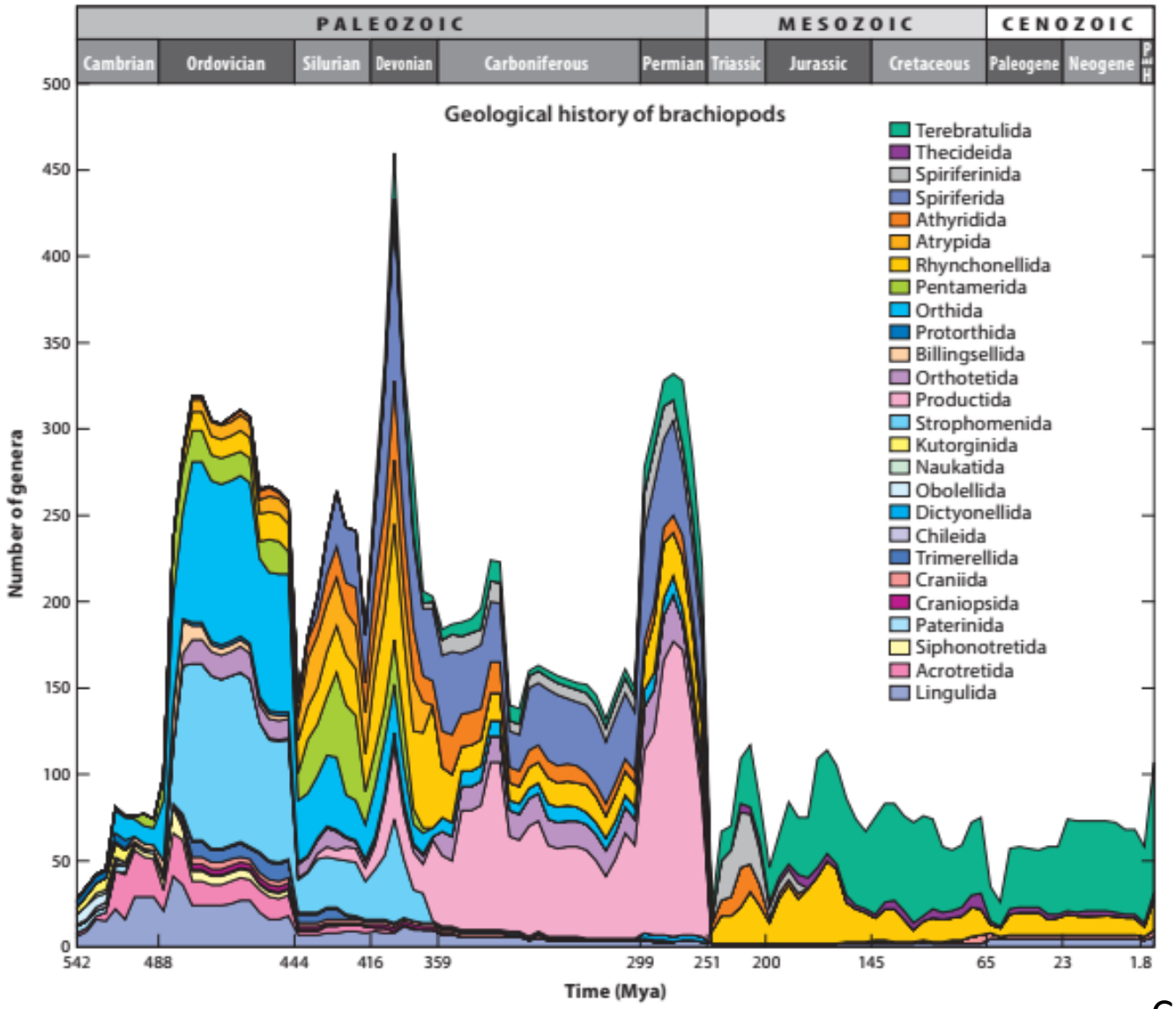
Gould and Calloway, 1980

Brachiopods – once thriving and now fallen phylum



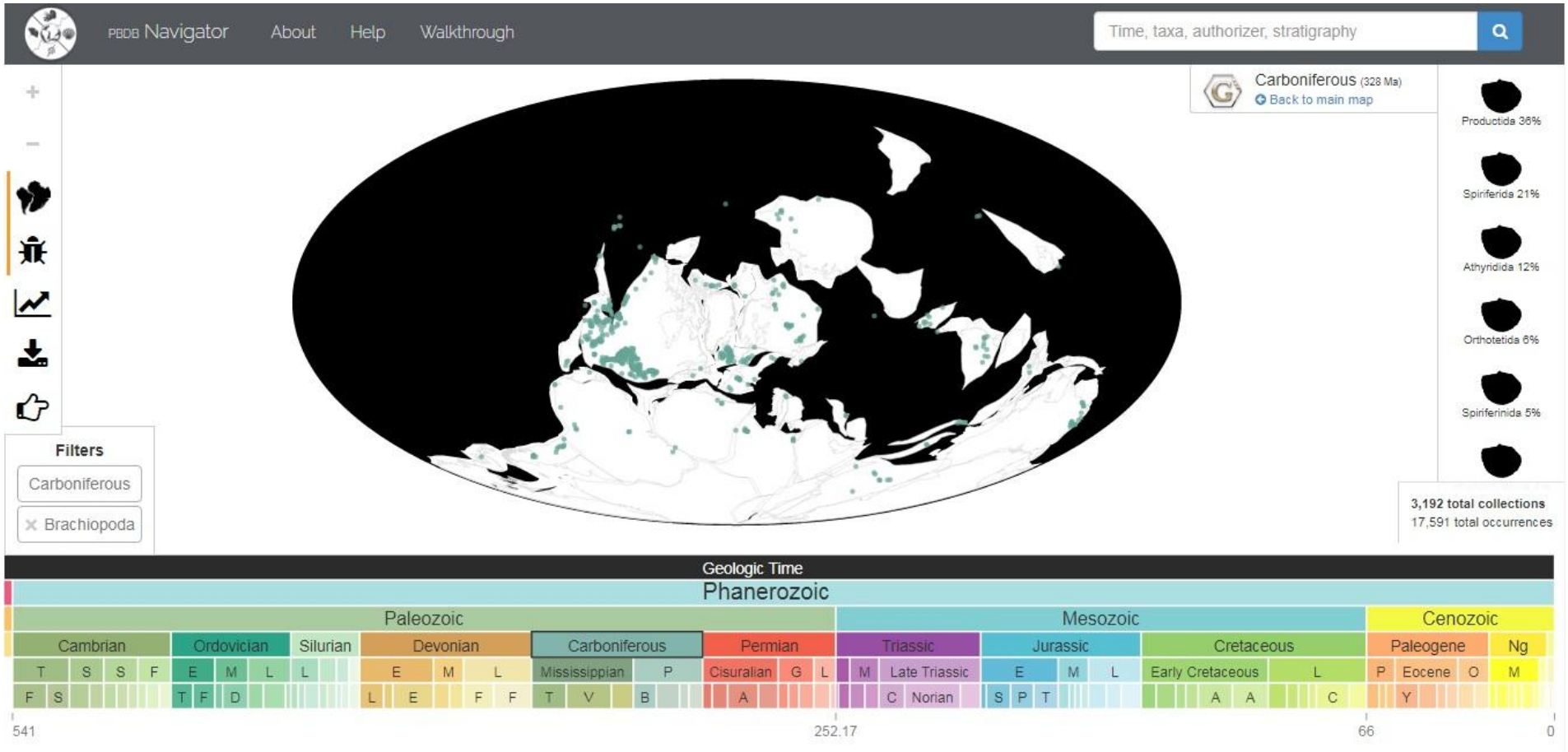
Gould and Calloway, 1980

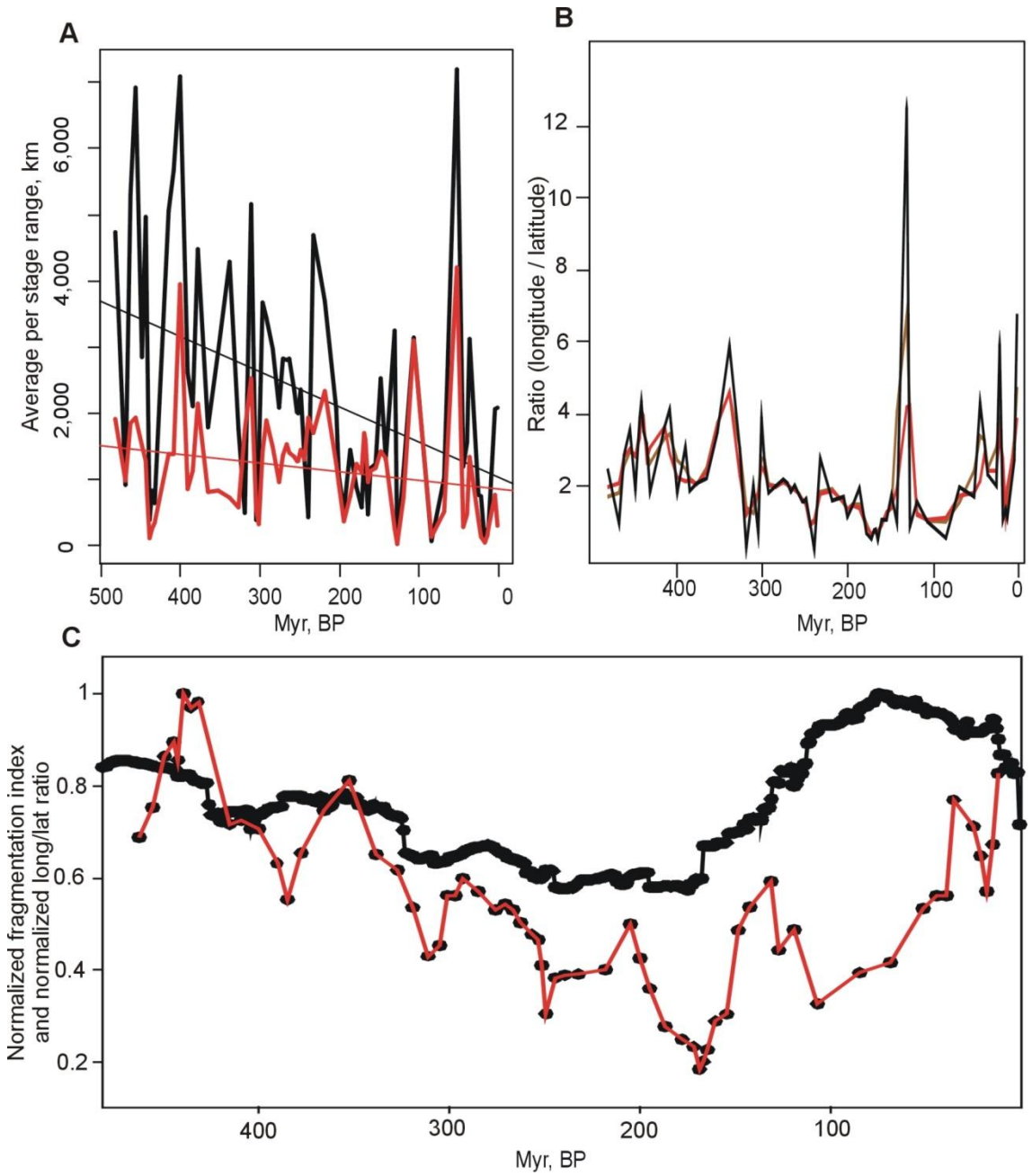
Brachiopod taxonomic diversity macroevolution



Carlson, 2016

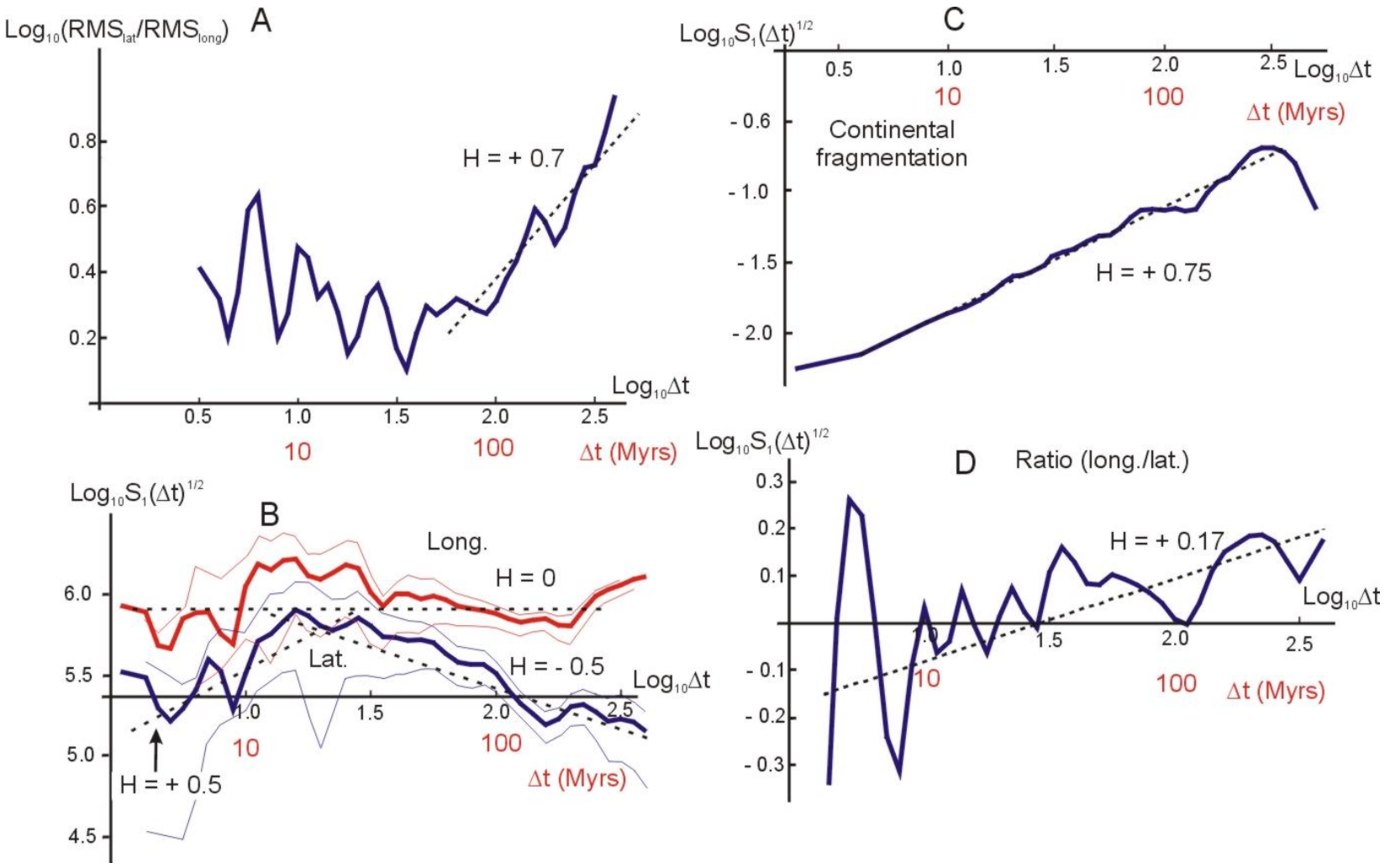
Estimation of brachiopod geographic ranges using Paleobiology Database data



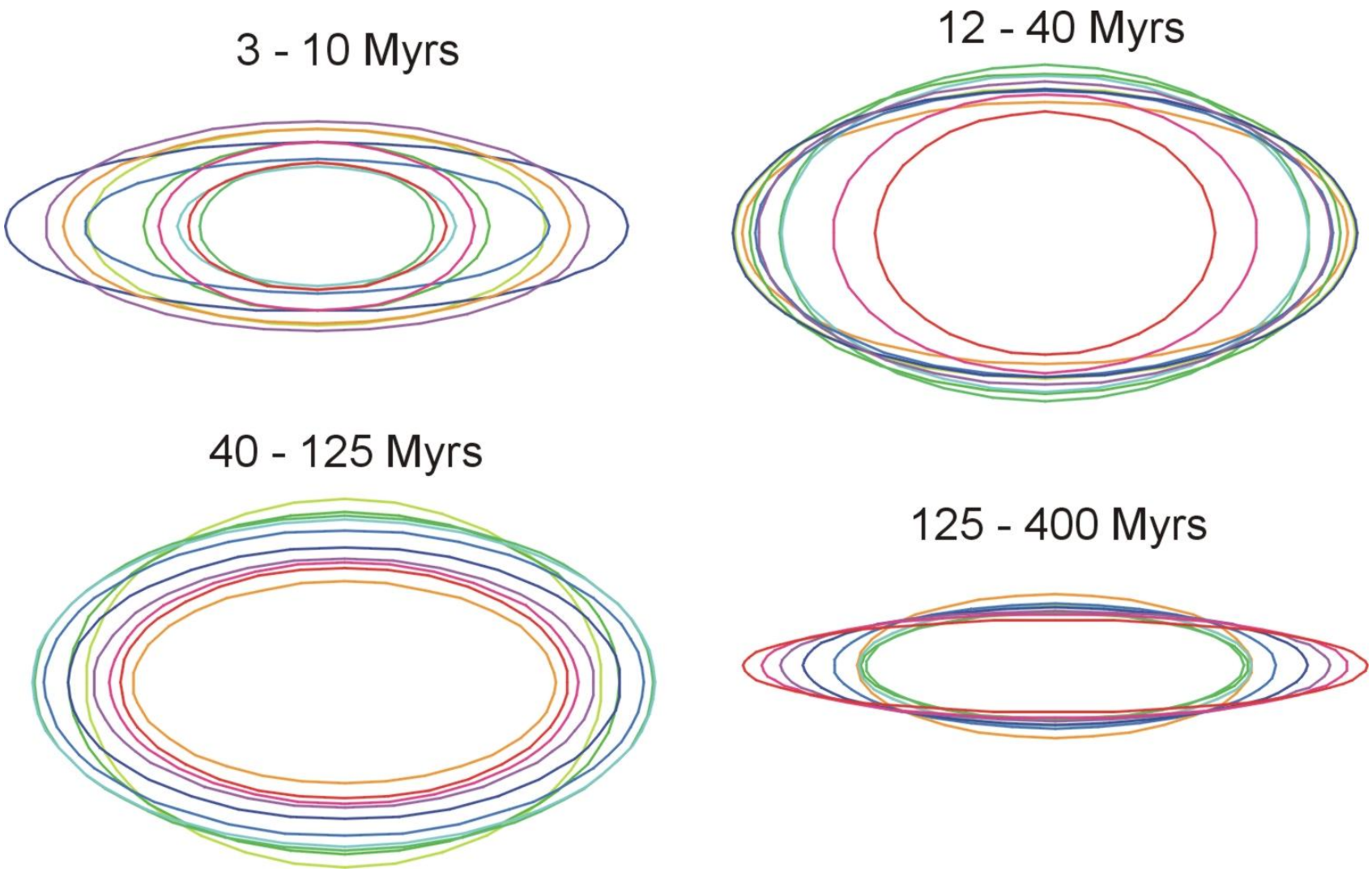


Evolution of average brachiopod genus level geographical latitudinal and longitudinal ranges and continental fragmentation patterns (Zaffos et al., 2017)

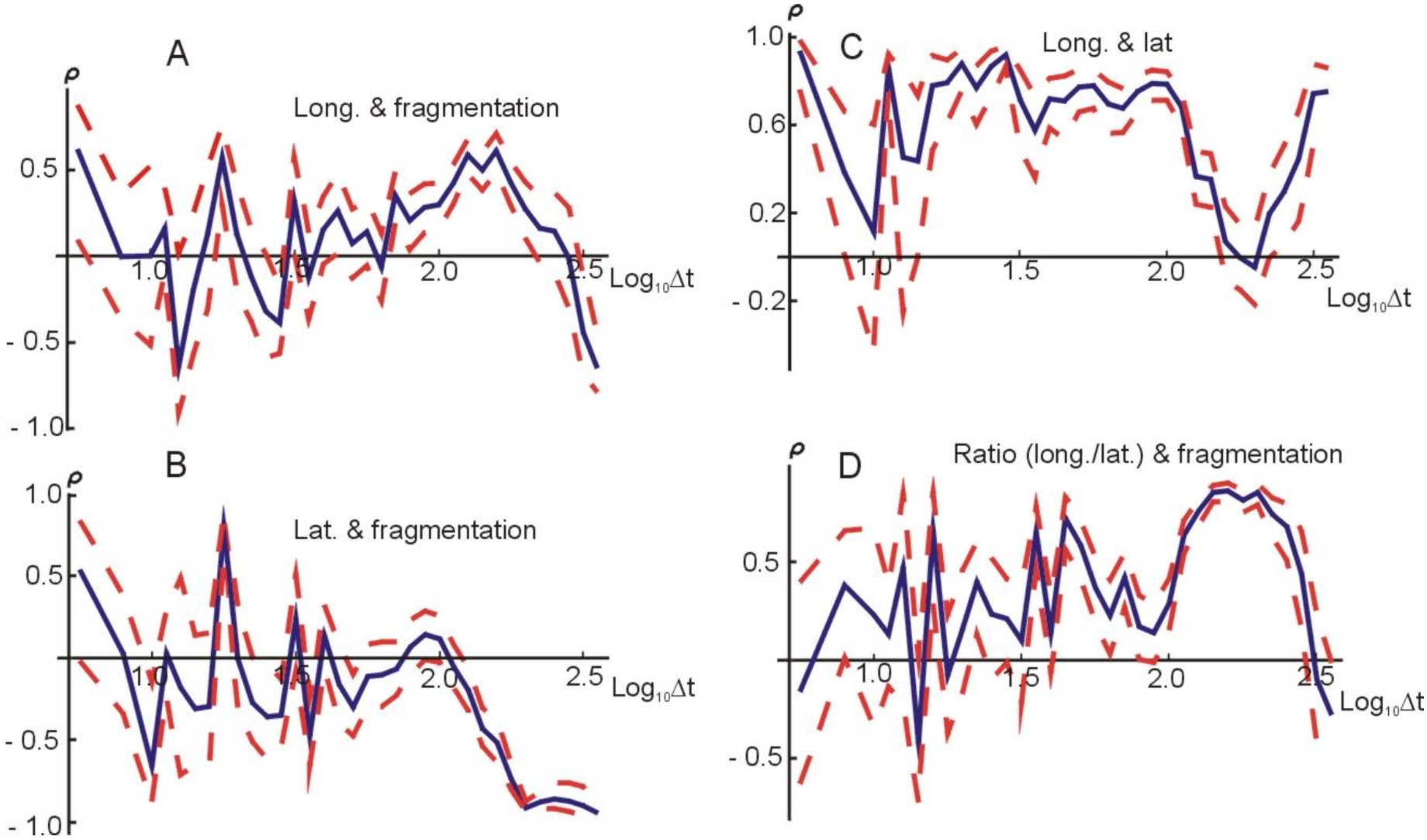
Scaling patterns of geographic ranges, their shapes, and the continental fragmentation index



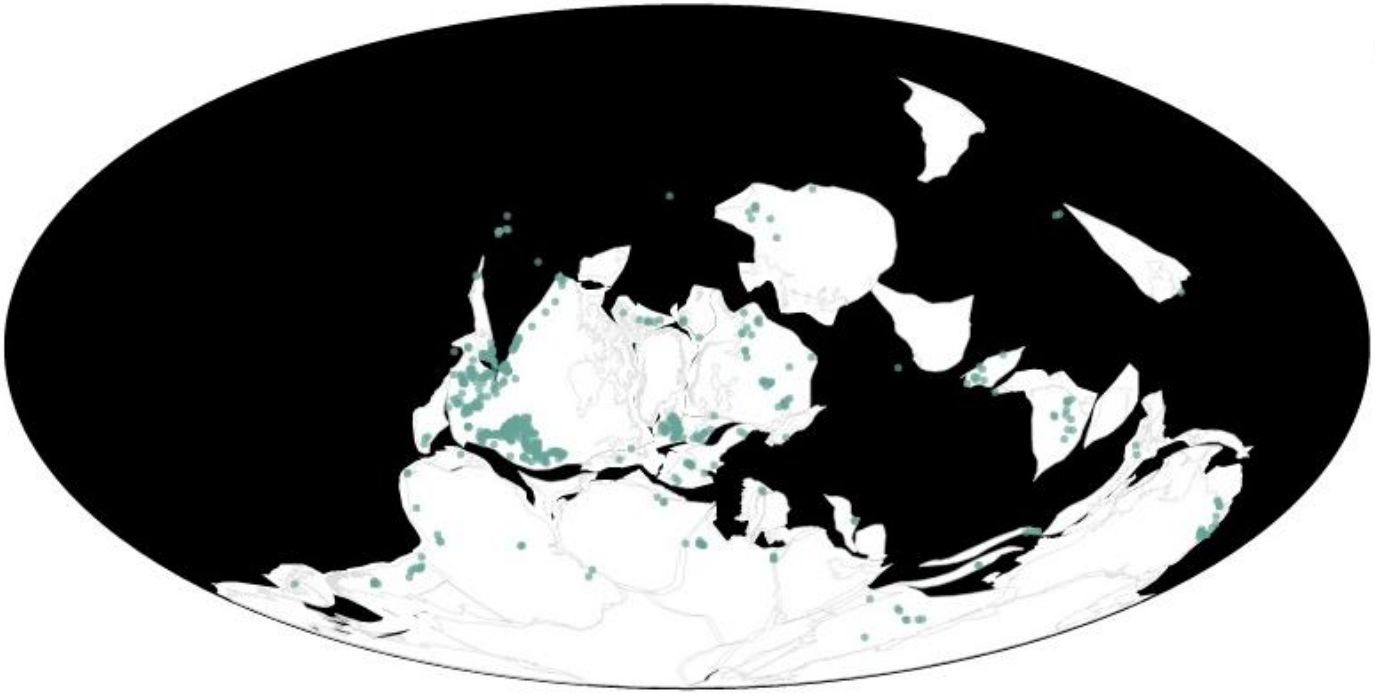
Scaling of latitudinal and longitudinal range size fluctuations – longitudinal fluctuations always (on average) larger



Scaling of correlations



- Continental fragmentation patterns control dynamics of brachiopod ranges at all time scales
  - Supercontinental cycle induced the first order trend in brachiopod geographic ranges sizes by means of changes in longitudinal expansion fitness



Thank you for your attention!

Research Council of Lithuania

S-MIP-21-9 “The role of spatial structuring in major transitions in macroevolution”