Body size trends in Neogene tortoises

Did tortoises evolve towards a smaller body size?

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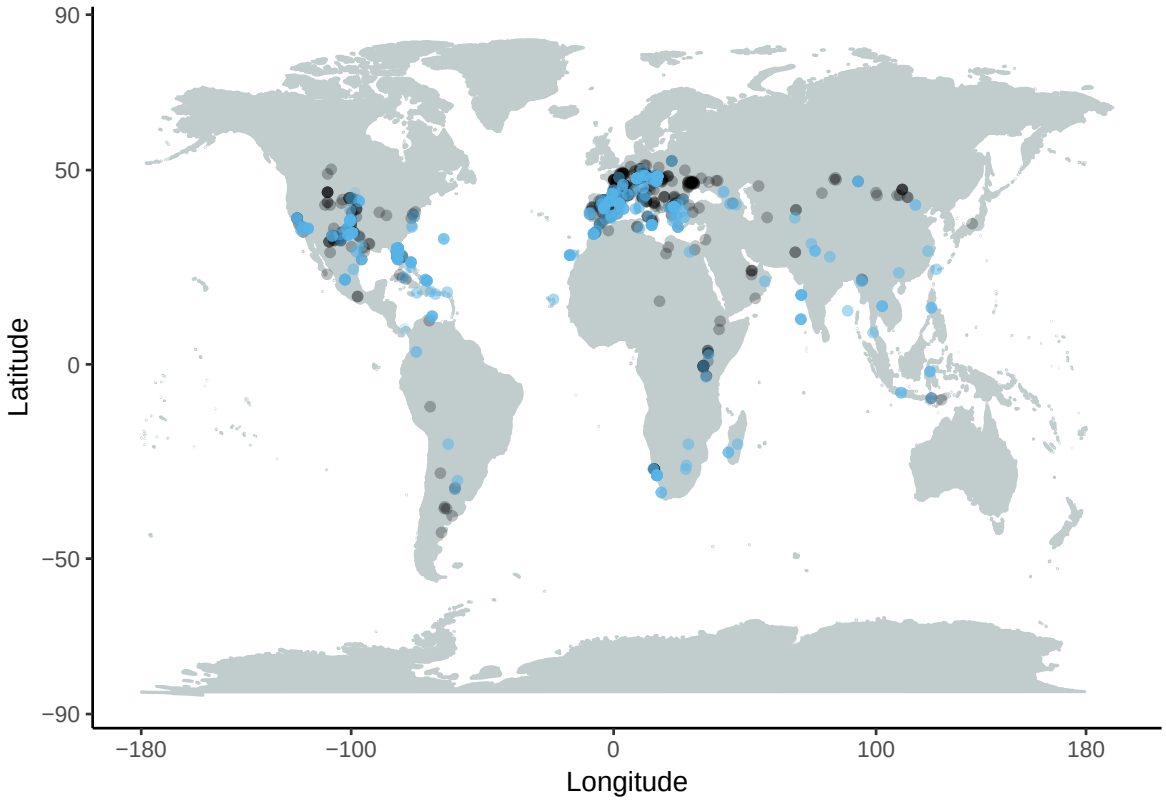
Data set



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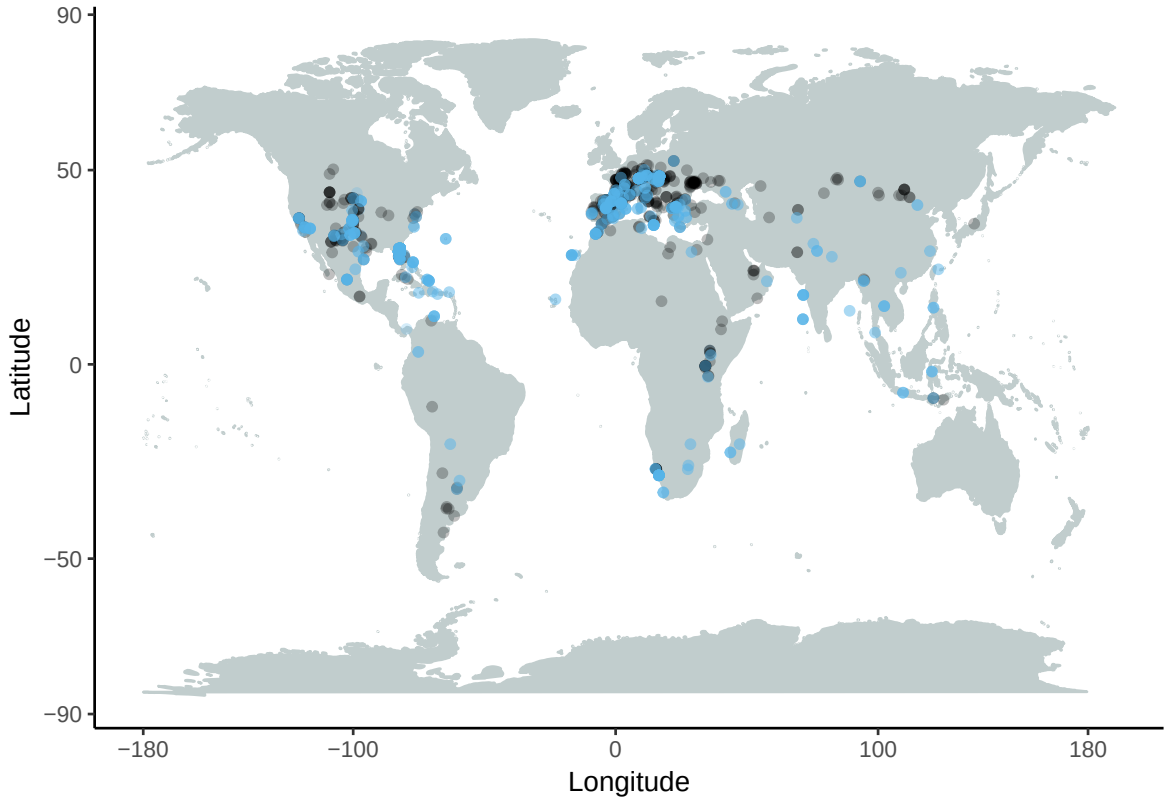

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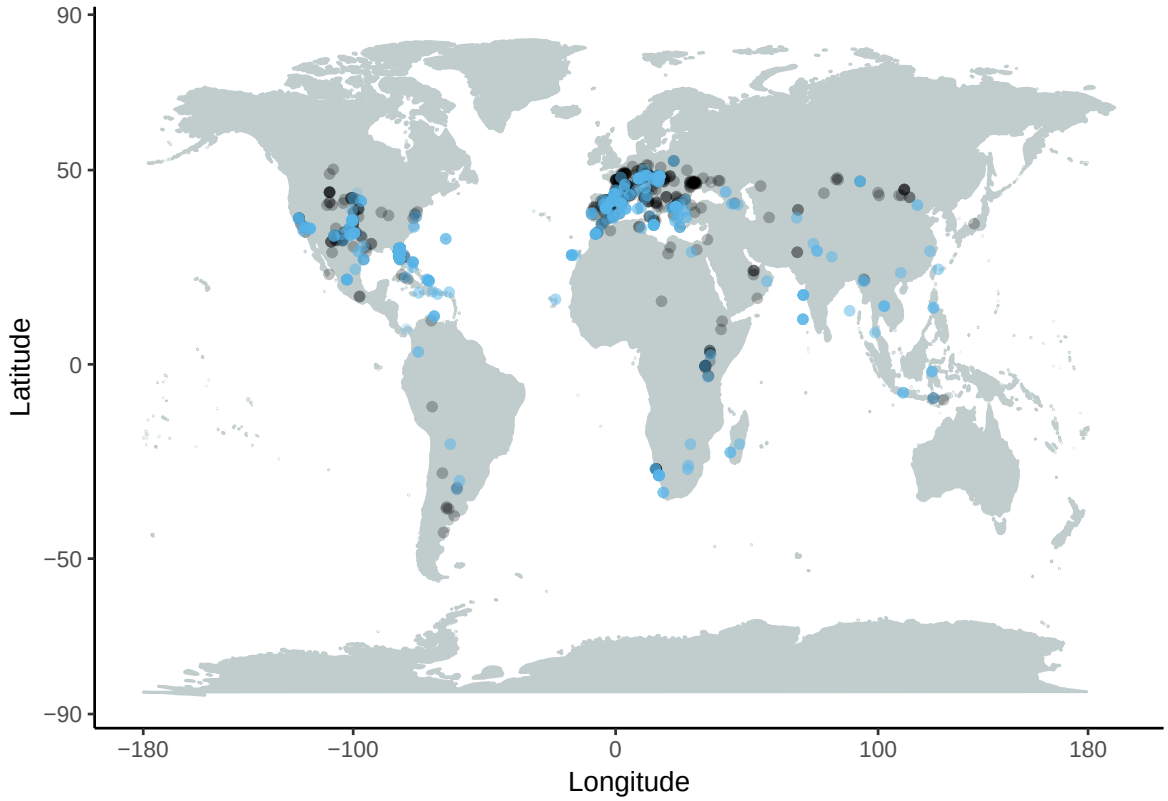

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- estimations from humeri/femora length, others (claw phalanges, verbal desription etc.)

Methods

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- paleoTS: fit different models to evolutionary trajectory of testudinid body size

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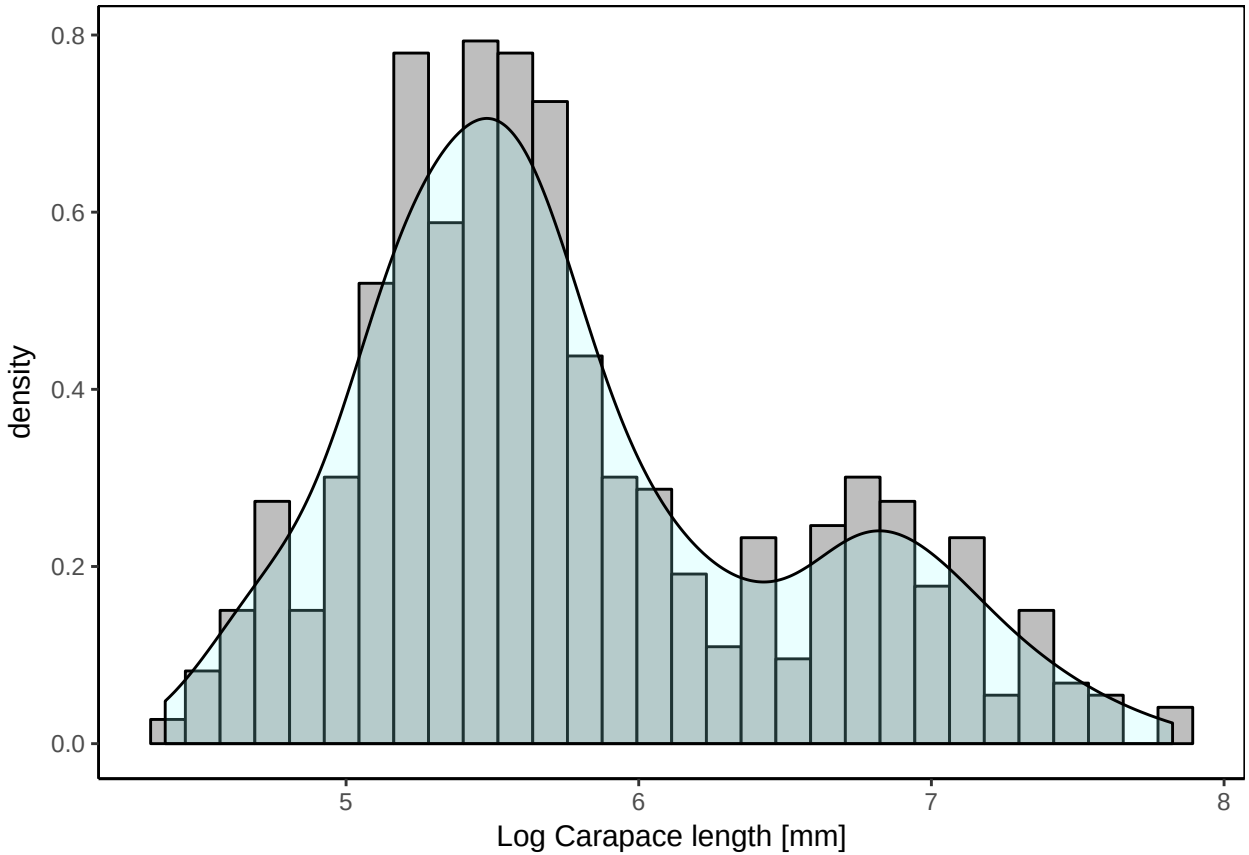
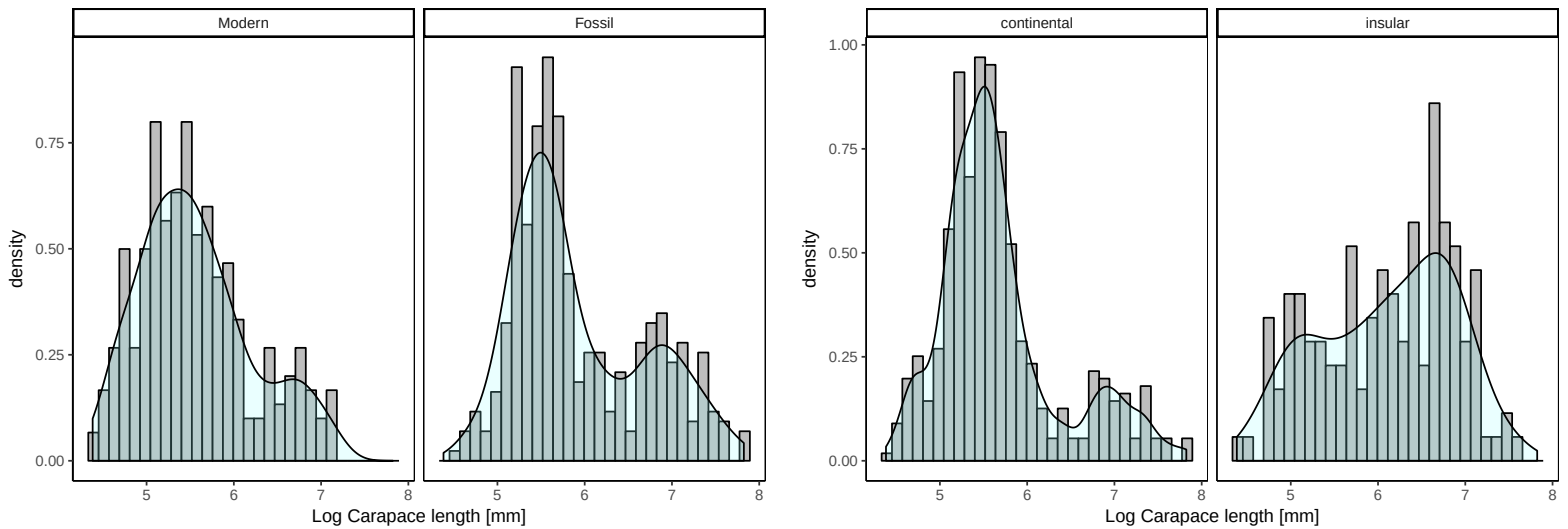
Body size distribution - complete data set

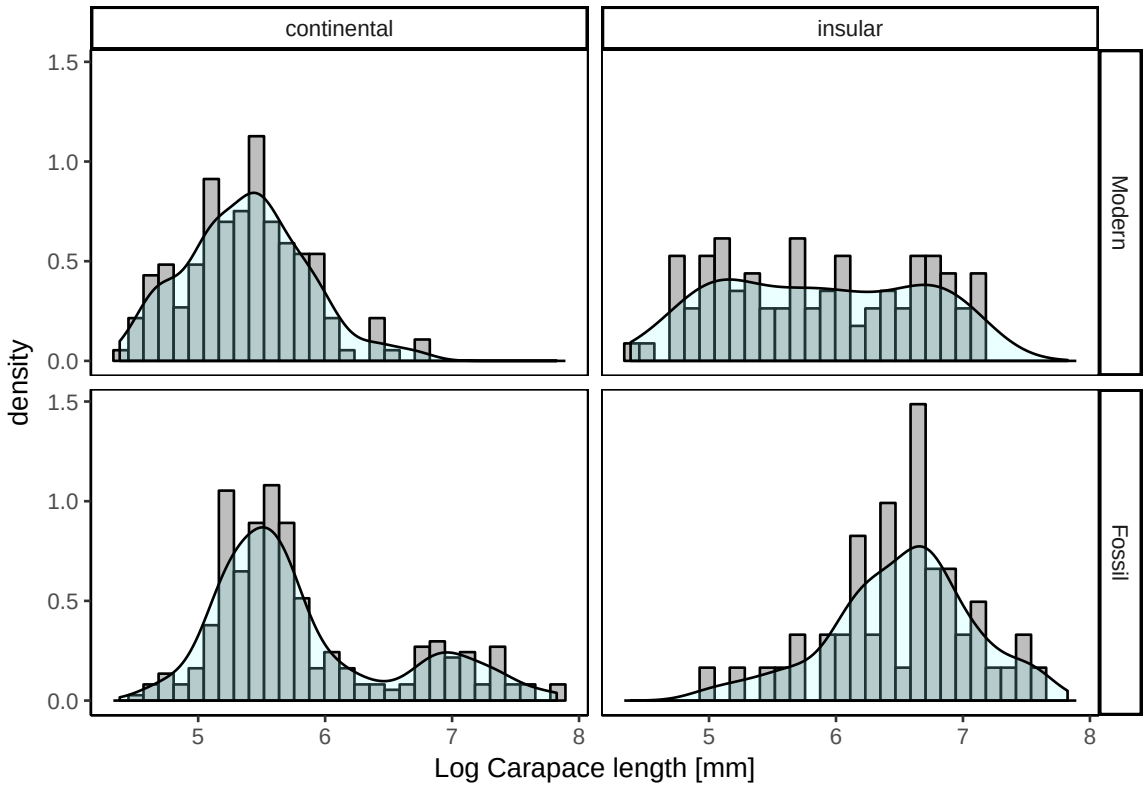


- bimodal distribution - right-skewed: small body sizes are more frequent

Body size distribution - subsets



- islands: higher abundance of larger-bodied tortoises (left-skewed)



- modern continentals: no large taxa!

- right-skewed body size distributions frequent in animal record: smaller animals usually more abundant - WHY? (competition, take up less space, need fewer resources, shorter generation times etc.)
- left-skewed on islands: island rule? (has been found for turtles in other studies →Angielzcyk + Jaffe??)
- relatively constant through time

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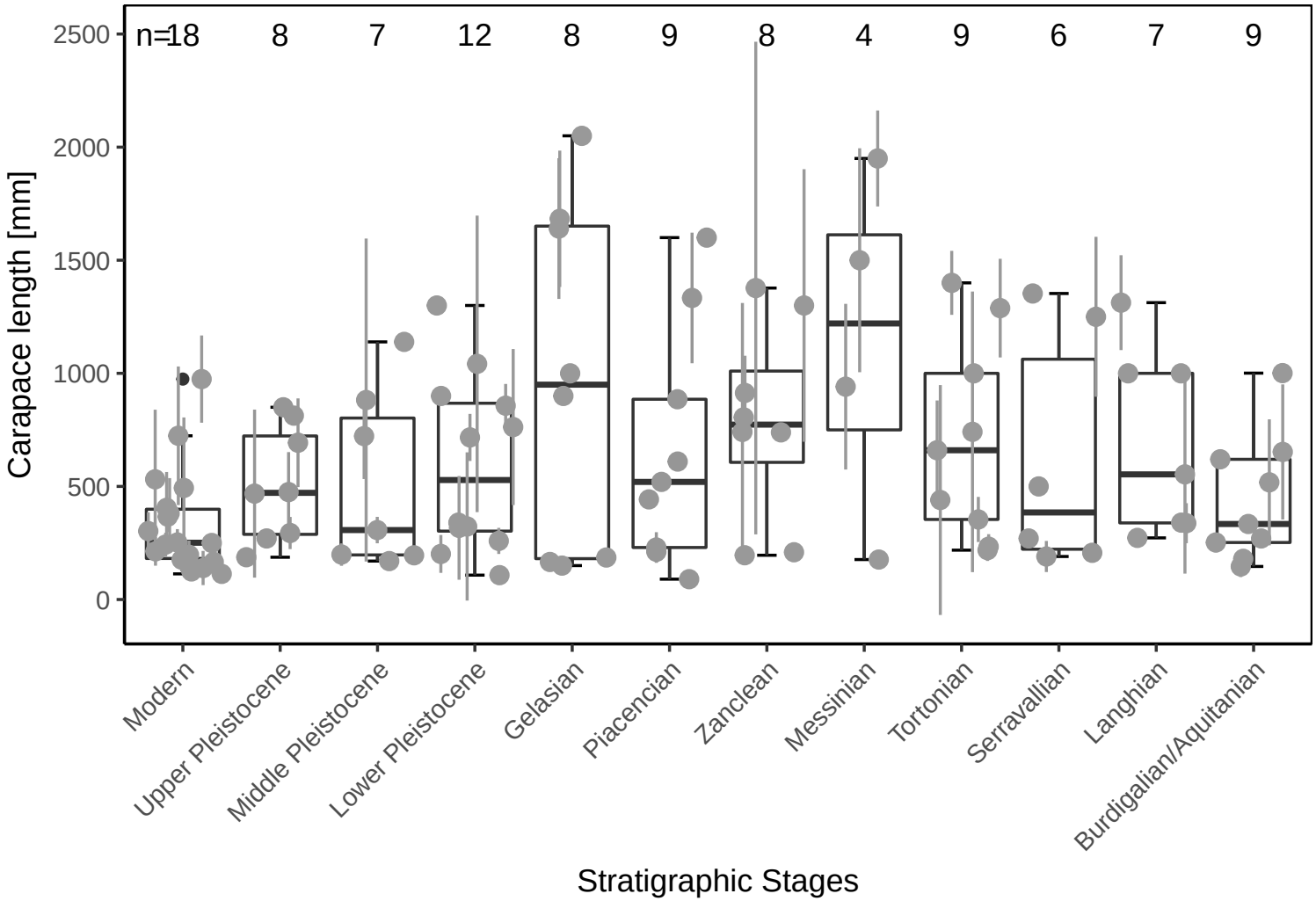
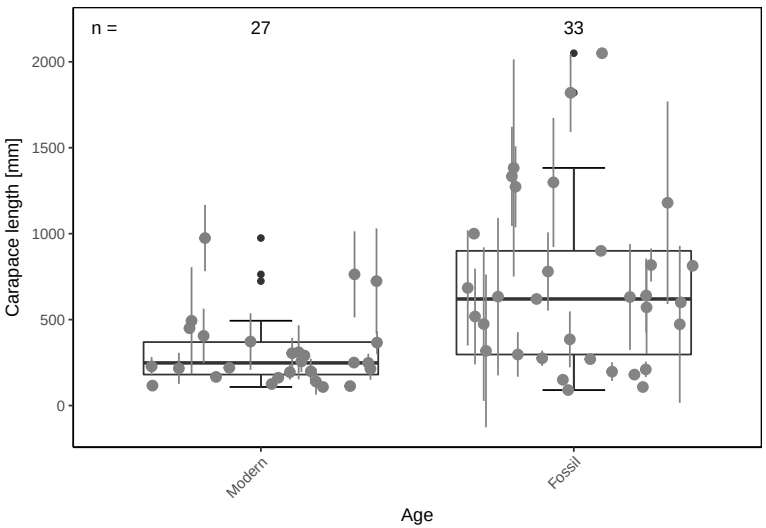
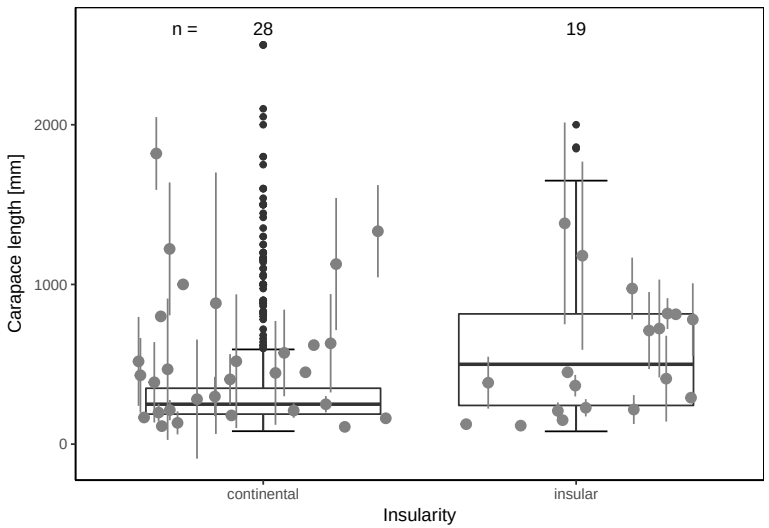
Comparison across time bins

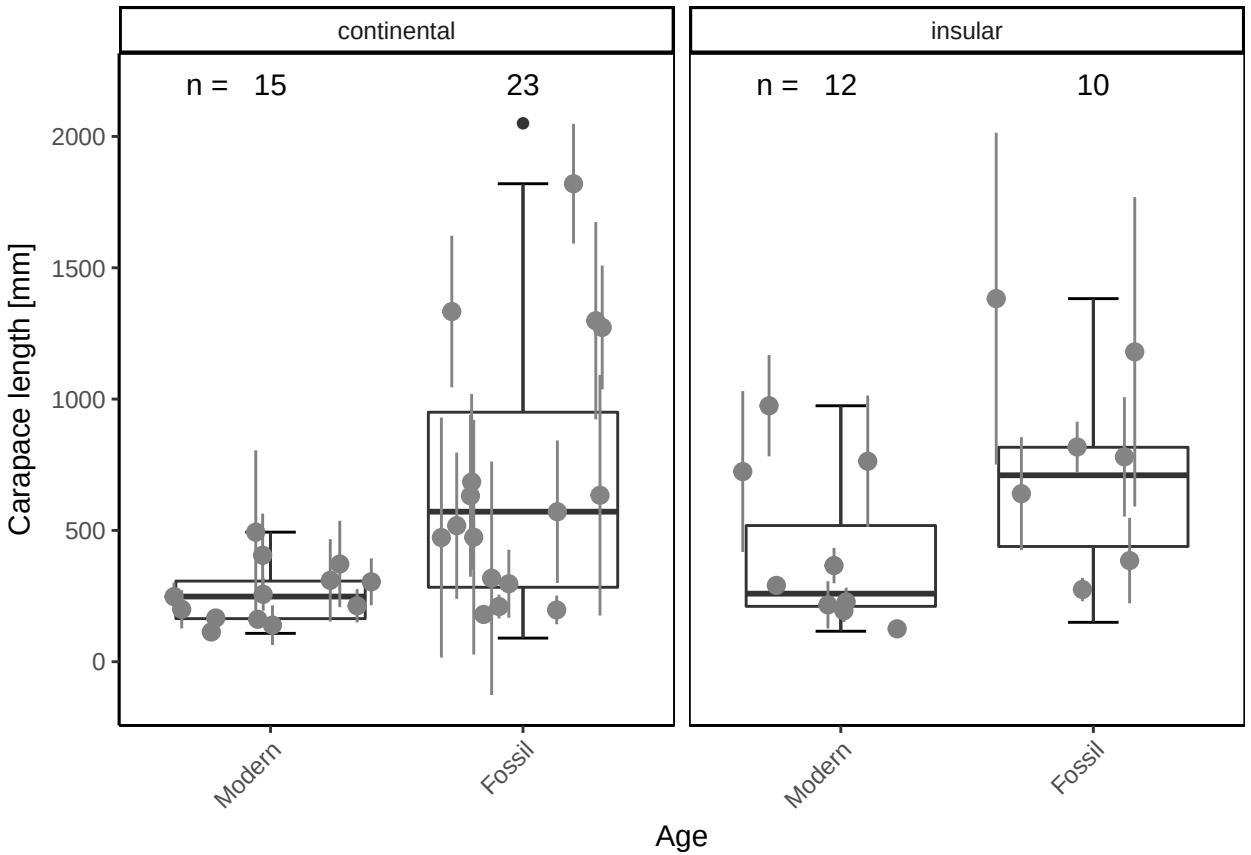


- only significant differences: Modern < Upper Pleistocene,

Modern < fossil, continental < insular






continental
insular
n = 15
23
n = 12
10
2000
1500
1000
500
0
Carapace length [mm]
Modern
Fossil
Modern
Fossil
Age

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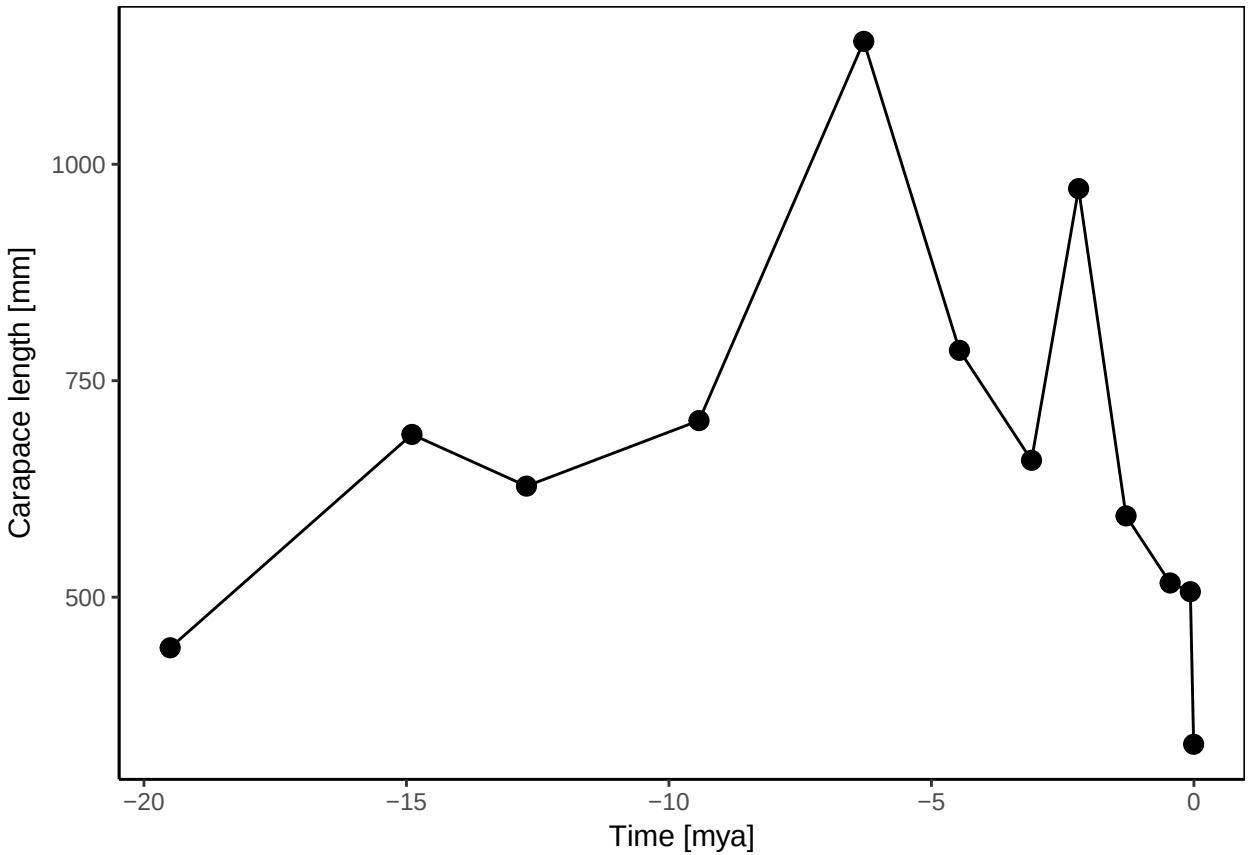
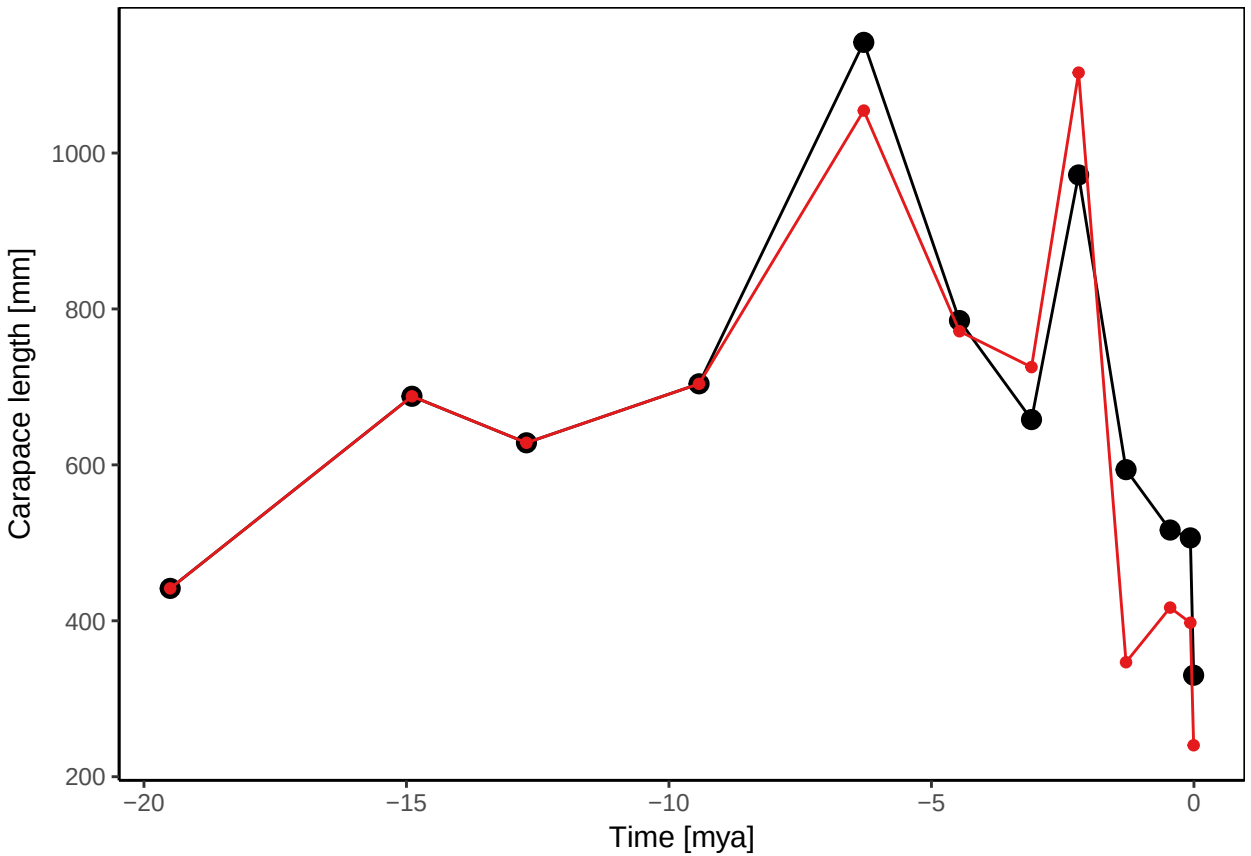
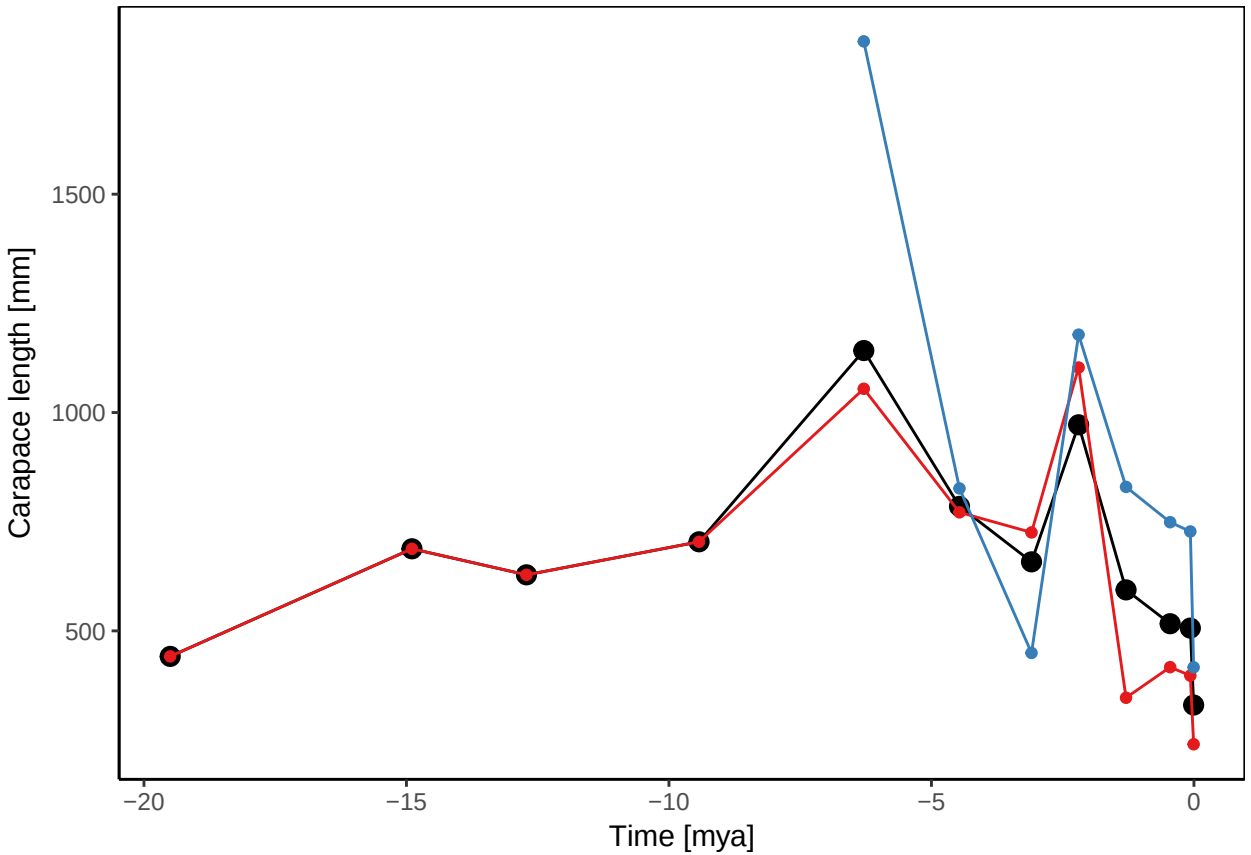

Carapace length [mm]
1000
750
500
−20
−15
−10
−5
0
Time [mya]


Carapace length [mm]
1000
800
600
400
200
−20
−15
−10
−5
0
Time [mya]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   → URW (continental tortoises)

Image sources

1. ....
2. ....