

HOW IMPORTANT WAS THE MESOZOIC FOR MAMMAL

DIVERSIFICATION?

2/3rds of mammalian history occurred in the Mesozoic
Geographical continuity of Pangea in the late Paleozoic and early Mesozoic eras allowed tetrapods to migrate freely – even global distribution

By Late Mesozoic – pangea no longer connected – spread/separation resulted in isolation of tetrapods and limited possibility for migration. So, they became progressively different on different continents.

*****breakup of pangea – continental drift

2 major geographic groups

-laurasia

-gondwana

End of the Mesozoic

-small mammals

-dinosaurs

-hair

-endothermy

-nocturnal

Mesozoic era periods

Cretaceous period

- extinction of dinosaurs
- first primates
- first flowering plants

Jurassic period

- First birds
- Dinosaurs diversity

Triassic period

- first mammals

- first dinosaurs

? WHAT ELSE WAS DIVERSIFYING AT THIS TIME?

Late Triassic – shift in vegetational communities especially in Gondwana where the floras were replaced by conifers. Floral turnover matched by faunal turnover – many animals extinct, and dinosaurs & mammals made a first appearance at this time, as well as other modern groups such as sphenodontids (lizard sister group), turtles & crocodiles. Extinct groups such as pterosaurs (flying reptiles) also appeared + marine reptiles like ichthyosaurs & plesiosaurs.

WHAT WERE THE 2 MAJOR PERIODS OF MAMMALIAN DIVERSIFICATION (WHEN DID DIVERSIFICATION TAKE PLACE)?

2 major radiations

1 – Jurassic/Cretaceous

2 – Cretaceous

- multituberculates

- first therians

- terrestrial ecosystem

BE ABLE TO NAME ONE OF THE OLDEST MAMMALS AND KNOW WHEN IT LIVED.

Early Jurassic – Morganucodon (also known as Eozostrodon) from Wales.*

- had 3 main molar cusps in a more or less straight line < primitive tribosphenic molars

- had a characteristic anatomy of the nasolacrimal duct, possibly associated with the new Harderian gland (associated w/ eye secretes oily substance that travels down the

nasolacrimal duct to the nose where it can be wiped off with paws – preen fur to repel water)

----anatomy present in Morganucodon but absent in cynodonts
Megazostrodon from south Africa, and Sinocodon from China. A somewhat older possible mammal is Adelobasileus known only from an isolated braincase from the late Triassic of Texas

WHAT WAS THE SIZE OF THE FIRST MAMMALS?

Earliest mammals very small (shrew sized) smaller than cynodonts (rat sized)

WHAT 2 CHARACTERS ABOUT TEETH ARE CHARACTERISTIC OF MAMMALS (VERSUS NON-MAMMALS)?

-diphyodonty detectable in the fossil record

-precise occlusion (mastication)

-sideways movement of jaws

-durable

WHAT IS AN IMPORTANT SKULL CHARACTERISTIC THAT DEFINES MAMMALS?

Dentary-squamosal jaw articulation

Derived skull features allowing for enlargement of the brain & inner ear area

WHAT 2 NON-SKELETAL CHARACTERISTICS DEFINE MAMMALS?

Hair & lactation

UNDERSTAND HOW THE EVOLUTION OF LACTATION, DIPHYDONTY, AND SUCKLING OCCURRED AND ARE IMPORTANT IN MAMMALIAN EVOLUTIONARY HISTORY