

THE AGE OF A FOSSIL



http://www.albertawow.com/campgrounds/Dinosaur_Provincial_Park/Dinosaur_Park_Campground.htm

An unknown fossil has been discovered in Alberta last week in Dinosaur Provincial Park, a famous fossil-rich site in Canada. The paleontologist from the discovering group states that the fossil is a newly discovered species. From the appearance of the newly discovered fossil, it was identified as belonging to one of the following genera in Table 1.

Fossil Genus	Age of the fossil
Crocodylus ¹	~ 1.5 Ma
Tyrannosaurus ²	67 Ma – 65 Ma
Plateosaurus ³	214 Ma – 204 Ma
Phillipsia ⁴	360 Ma – 251 Ma
Characodictyon ⁵	812 Ma – 717 Ma

Table 1: Age of Fossil Genus

This unknown fossil, Fossil X, was discovered in a stratum. The structure of the strata is shown below.

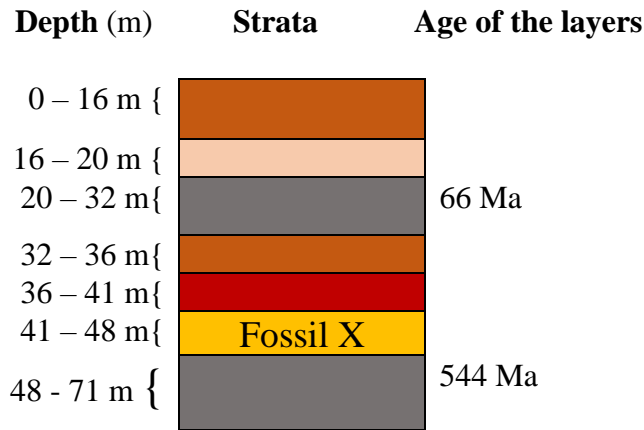


Figure 1: The stratum structure where the fossil was found.

Each color represents a different layer. (Ka = 10³ years ago, Ma = 10⁶ years ago, Ga = 10⁹ years ago)

Through deep analysis of these stratum layers, the age of the volcanic ash layers (grey color) were determined. To determine the age of Fossil X, the paleontologist attempted radiocarbon dating but no carbon – 14 was detected. Why was radiocarbon dating not the appropriate method to be used? Explain quantitatively. What other radiometric dating methods might be used to date Fossil X?

Moreover, when the correct radiometric method was used, 70% of the radio-isotope was detected in Fossil X. Estimate the age of Fossil X and find what genus the fossil actually belongs to using Table 1.



References:

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