COMPETITION 1: THE FOSSIL RECORD

Palaeontologists believe that only about 1% of all the animals that ever lived have been found as fossils. How do they come up with this figure? Think about reasons why finding a fossil of a particular ancient species is so unlikely. You can also use the further reading suggestions and videos on this page to help you develop your answer. Your answer should be 500 words or less.

How remarkable would it be to have a complete fossil record; giving a clear, chronological and precise database that allows palaeontologists to accurately understand all species that have ever lived? This would be an ideal reality that is sadly untrue. It is estimated only 1% of animals that have existed since evolution began have been found as fossils. Proof of unique or new species existing may be found as fossils, relying on empirical evidence to support claims. Such an example is the Avalon Explosion. Most famously, Darwin was able to propose his theory of evolution supported by evidence from his time in the Galapagos. However, fossils are not queuing up in orderly lines to be let through the laboratory doors and evidence of ancient animals is in short supply.

It is rare that an ancient species is found as a fossil. This is mainly due to the nature of fossil formation. Certain conditions must be met; bones and remains must be buried and stay so for hundreds of years if fossilisation is to occur. It is by coincidence that dead or dying animals find themselves in such situations, reducing the amount of the species that possibly becomes fossilised.

If chance hadn't tested modern palaeontologists enough, there is the hierarchical food chain to then compete with. If a species declines, a stronger alternative takes its place in the evolutionary chain. For example, darker rabbits may die out in snowy tundras, replaced by white rabbits. The first species then becomes weaker, thus easier prey. Any remains may be destroyed or consumed. This links into the idea of taxonomic turnover - the continual emergence of new species alongside decline of older species. Therefore, such animals are less likely to become fossils, again decreasing the percentage of animals that will eventually become fossilised. Fossilisation is a rare, naturally occurring process.

Another consideration is the limited preservation fossilisation allows. In general, only hard outer parts remain (not taking into account preservations in ice, silicone or peat to name a few examples). Shells of certain branches of marine life or the exoskeleton of an animal only provide a rough structure of the animals biological make up. No softer, internal structures remain, such as muscular co-ordination, fat distribution, organ systems or skin covering. This results in reduced accuracy of visualisation. Dinosaurs, for example, may have been in actuality far less 'spiky' than popular film franchises promote.

Finally, we reach the ultimate reason why finding a particular ancient species is so unlikely. Fossils are generally buried under hundreds, thousands even, of tonnes of earth. It is very unpractical and verging on impossible, to move such vast amounts of soil and rock in search of a small fossil. Therefore, fossils emerge when nature wishes it so - when land is uncovered due to a large landslide for example. The likelihood of finding the species you desire to is very low. Thus, we conclude with the summarised idea that fossil creation and emergence is rare, explaining the relatively minuscule fossil record.