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Extinction hits 'whole families'

By Victoria Gill
Science reporter, BBC News



Shells (Rowan Lockwood)

The fossil record of marine bivalves dates back to the Jurassic period

Whole "chunks of life" are lost in extinction events, as related species vanish together, say scientists.

A study in the journal *Science* shows that extinctions tend to "cluster" on evolutionary lineages - wiping out species with a common ancestor.

The finding is based on an examination of past extinctions, but could help current conservation efforts.

Researchers say that this phenomenon can result in the loss of an entire branch of the "tree of life".

The message for modern conservation, say the authors, is that some groups are more vulnerable to extinction than others, and the focus should be on the lineages most at risk.

Lead researcher Kaustuv Roy, a biologist from the University of California, San Diego, focused on marine bivalves - including clams, oysters and mussels. The fossil record for these creatures dates back almost 200 million years.

By tracing this documented timeline of evolution and extinction, the team was able to see the effects of "background extinctions" as well as the mass extinctions, such as the one around 65 million years ago during which the dinosaurs finally died out.

It's like a casino of extinctions, with the odds rigged against certain groups
Richard Grenyer, Imperial College London

Many species have become extinct during the relatively stable periods between those global calamities.

But even during such quiet periods, the team found that extinctions tended to cluster into evolutionary families - with closely-related species of clams vanishing together more often than would be predicted by chance.

Richard Grenyer, a biologist from Imperial College London, who was not involved in the study, told BBC News that by going "way back into the fossil record" this study provided important evidence of the patterns of extinction.

"Big groups of organisms tend to be similar to one another," he explained. "Look at the large cats for example."

But genetic similarities also mean, said Dr Grenyer, that "a bad effect that affects one of them, will likely affect all of them".

"It's like a casino of extinctions, with the odds rigged against certain groups."

Life's library

According to this pattern, the study's authors point out, extinctions are likely to eliminate entire branches of the evolutionary tree.

Professor Roy said: "If you have whole lineages more vulnerable than others, then very soon, even with relatively moderate levels of extinction, you start to lose a lot of evolutionary history."



Bengal tiger

Conservation of one endangered species could help its close relatives

Julie Lockwood, an ecologist from Rutgers University in New Jersey, US, who did not take part in this study, explained that because extinction events "hit certain lineages extremely hard... we lose whole chunks of life."

"There are examples of modern species where the same thing is happening," she told BBC News.

"In seabirds for example, the same drivers - climatic change and habitat loss - are threatening whole groups of species."

Richard Greyner likened this loss to a fire in a library.

"Because whole sections are lost - the whole of the physics section, or all of the romantic fiction, the overall loss is much worse than if you randomly burned every 400th book."

But Dr Greyner said that this evidence could help to drive more focused, and therefore more effective conservation efforts.

"We can use this information," he said.

"It doesn't make the conservation of individual species any easier, but if we know the sorts of things that affect tigers, we can infer conservation biology about the tiger's close relatives."