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HOW RESILIENT WERE PLANKTONS TO GLOBAL WARMING?

Relevant for: Environment | Topic: Biodiversity, Ecology, and Wildlife Related Issues

Plankton was said to be profoundly affected by water temperature and climate change, according to a series of five studies published on Thursday, May 21, 2015, in Science about the voyage of the schooner Tara. | Photo Credit: The Hindu photo library

An international team of scientists has found a remarkable type of fossilisation that has remained almost entirely overlooked until now. The fossils are microscopic imprints, or 'ghosts,' of single-celled plankton, called coccolithophores, that lived in the seas millions of years ago, and their discovery is changing our understanding of how plankton in the oceans are affected by climate change.

Declines in the abundance of coccolith fossils have been documented from multiple past global warming events, suggesting that planktons were severely affected by climate change and ocean acidification. But a study found (*Science*) new global records of abundant ghost fossils from three Jurassic and Cretaceous warming events (94, 120, and 183 million years ago), suggesting that coccolithophores were more resilient to past climate change than was previously thought.

Despite their microscopic size, coccolithophores can be hugely abundant in the present ocean, being visible from space as cloud-like blooms. After death, their calcareous exoskeletons sink to the seafloor, accumulating in vast numbers, and forming rocks such as chalk.

As more mud was gradually deposited on top, the resulting pressure squashed the coccolith plates and other organic remains together, and the hard coccoliths were pressed into the surfaces of pollen, spores, and other soft organic matter. Later, acidic waters within spaces in the rock dissolved away the coccoliths, leaving behind just their impressions — the ghosts.

"The ghost fossils show that nannoplankton was abundant, diverse, and thriving during past warming events in the Jurassic and Cretaceous, where previous records have assumed that plankton collapsed due to ocean acidification," Prof. Richard Twitchett from Natural History Museum, London says in a release. "These fossils are rewriting our understanding of how the calcareous nannoplankton respond to warming events."