

## **Fish fauna paleobiodiversity during the early Paleogene greenhouse world: the Fossil-Lagerstätten record of northeastern Italy**

*(Proposer: Prof. Luca Giusberti)*

Stratigraphic and paleoenvironmental evidences concur in suggesting that exceptional fossil preservation can be correlated over wide areas and different depositional contexts. Certain time intervals in the geological time appear to be conducive to exceptional preservation of fossils, particularly of articulated skeletal remains of fishes. The origin of Fossil Lagerstätten apparently was promoted in coincidence with global environmental changes, such as mass extinctions, OAE, carbon isotopic anomalies, and high concentrations of atmospheric carbon dioxide. Summarizing, this “Preservation Hypothesis” postulates that spikes in atmospheric CO<sub>2</sub> usually coincide with exceptional preservation events, which can be considered as consequent to transient global perturbations. Such hypothesis implies that extremely precise correlation between deep and shallow water settings are possible using deposits with exceptional preservation of fossils, thereby allowing a detailed interpretation of the composition of the fish assemblages in different environmental settings. Moreover, the Konservat Lagerstätten may provide an accurate record of the biotic effects of a global perturbation at the higher trophic levels and, for this reason, a succession of Konservat Lagerstätten constitutes an extraordinary archive of the climatic and oceanographic changes that occurred in deep time. The Paleogene stratigraphic record of NE Italy includes some Konservat Lagerstätten (e.g., Sölteri, Bolca and Monte Solane) with exquisitely preserved fishes, in many cases virtually unknown or only superficially investigated, thereby representing an unexploited archive of the main perturbations that occurred in a narrow interval from about 51 to about 49 Ma, during the later part of Early Eocene Climatic Optimum. The goal of this project is to contribute to the knowledge of the paleoichthyodiversity of some of these Konservat Lagerstätten and to interpret their stratigraphic, paleoenvironmental and paleoclimatological significance.

Scientific collaborations: Università degli Studi di Torino

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