Trilobite Fossil Record Explorer - Dashboard Report

# Overview

The Trilobite Fossil Record Explorer dashboard provides an interactive visualization of trilobite fossil data from over 29,000 records. It explores their temporal distribution, geographic spread, and ecological characteristics, helping researchers and enthusiasts understand how trilobites lived and evolved through geologic time.

# Visualizations Included

## 1. Specimen Count by Time Period

A bar chart displays the number of fossil occurrences by geologic time period. This helps identify periods of high trilobite diversity and fossil preservation. Notably high specimen counts are seen during the Cambrian, Ordovician, and Carboniferous periods.

## 2. Global Fossil Map

A world map shows fossil discovery sites based on latitude and longitude. Points are colored by time period or taxonomic order, providing a clear view of trilobite geographic distribution. Clusters in North America, Europe, and parts of Asia highlight rich fossil beds.

## 3. Ecological Roles: Environment vs. Life Habit

A matrix (or bar chart) comparing paleoenvironment (e.g., marine, reef, deep basin) and life habit (e.g., low-level epifaunal). Reveals that most trilobites were bottom-dwellers in marine environments, supporting current paleoecological theories.

# Interactive Features

Filters allow users to explore data by:  
- Time period  
- Taxonomic order  
- Geographic region  
  
Hover tooltips provide specimen-level information. Cross-filtering between maps and charts supports exploratory analysis.

# Key Insights

- Trilobites were most diverse and widely distributed during the early Paleozoic.  
- Their ecological roles were relatively consistent, favoring benthic marine habitats.  
- Fossil distribution reflects both biological history and preservation bias due to sedimentary conditions.

# Data Source

The data includes:  
- Taxonomy: Order, Family, Genus, Species  
- Age: Maximum & Minimum Age (in million years)  
- Location: Country, Coordinates  
- Environment, Lithology, Preservation Mode

# Conclusion

This dashboard is a powerful tool for visualizing and understanding the fossil record of trilobites across both time and space. It is suitable for use in academic research, education, and museum displays.