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import matplotlib.pyplot as plt
import numpy as np

# Data for plotting (example data)
depth = np.array([0.3, 0.6, 0.9, 1.2, 1.5, 1.8, 2.1]) # Depth in meters
cyperaceae = np.array([80, 70, 60, 50, 40, 30, 20]) # Cyperaceae pollen distribution
asteraceae = np.array([10, 20, 30, 40, 50, 60, 70]) # Asteraceae pollen distribution

# Plot 1: Pollen distribution by depth
plt.figure(figsize=(8, 6))
plt.plot(cyperaceae, depth, label="Cyperaceae (莎草科)", marker="o")
plt.plot(asteraceae, depth, label="Asteraceae (菊科)", marker="s")
plt.gca().invert_yaxis() # Invert y-axis to show depth descending
plt.xlabel("Pollen Percentage (%)")
plt.ylabel("Depth (m)")
plt.title("Pollen Distribution with Depth")
plt.legend()
plt.grid(True)
plt.savefig('/mnt/data/Pollen_Distribution_Depth.png')
plt.show()

# Time series data
time = np.array([1000, 2000, 3000, 4000, 5000, 6000, 7000]) # Years before present
cyperaceae_time = np.array([80, 75, 60, 50, 45, 35, 25]) # Cyperaceae pollen counts over time
asteraceae_time = np.array([15, 20, 35, 45, 50, 60, 70]) # Asteraceae pollen counts over time

# Plot 2: Pollen counts over time
plt.figure(figsize=(8, 6))
plt.plot(time, cyperaceae_time, label="Cyperaceae (莎草科)", marker="o")
plt.plot(time, asteraceae_time, label="Asteraceae (菊科)", marker="s")
plt.xlabel("Time (Years BP)")
plt.ylabel("Pollen Percentage (%)")
plt.title("Pollen Dynamics Over Time")
plt.legend()
plt.grid(True)
plt.savefig('/mnt/data/Pollen_Dynamics_Time.png')
plt.show()

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