Deccan Volcanism: A Catalyst for Tropical Flora Diversity

Impact of Deccan Volcanism on Flora

A recent study reveals that Deccan Volcanism, which occurred around 66 million years ago, did not negatively impact tropical flora. Instead, it indirectly promoted diverse tropical ecosystems by eliminating dinosaurs and gymnosperms, creating fertile habitats for angiosperms.

Tropical Rainforests' Resilience

The findings suggest that tropical rainforests can recover swiftly if left undisturbed under favorable climatic conditions. This resilience underscores the potential for quick recovery in today's changing climate.

The Eruption's Extent and Effects

Deccan volcanic eruptions lasted hundreds of thousands of years, contributing to the Cretaceous-Paleogene (K-Pg) mass extinction, which saw the global decline of ammonoids and dinosaurs. While the faunal impacts are well documented, the effects on flora remain a subject of debate.

Indian Plate: A Case Study

As the epicenter of Deccan Volcanism, the Indian Plate serves as an example of potential floral turnover during this period. Researchers found minimal regional impact on flora, instead observing greater angiosperm diversification on the plate.

Factors Influencing Flora Development

The rapid diversification of tropical flora was driven by the Indian Plate's shift within the Inter Tropical Convergent Zone (ITCZ) and the warm, humid climate during dormant volcanic phases.

Research Methods and Findings

The study, conducted by the Birbal Sahni Institute of Palaeosciences, involved analyzing pollen, spores, and organic matter from sedimentary rocks in Yeotmal, Maharashtra. Palynology and ecological models like the Nearest Living Relative (NLR) and Coexistence Approach (CA) were used in the analysis.

Conclusion: Insights for Modern Climate Challenges

Published in Earth Science Reviews, the study highlights that despite greenhouse emissions from Deccan Volcanism causing the K-Pg extinction, tropical flora recovered rapidly. This resilience promises insights into how modern ecosystems may respond to current climate changes.

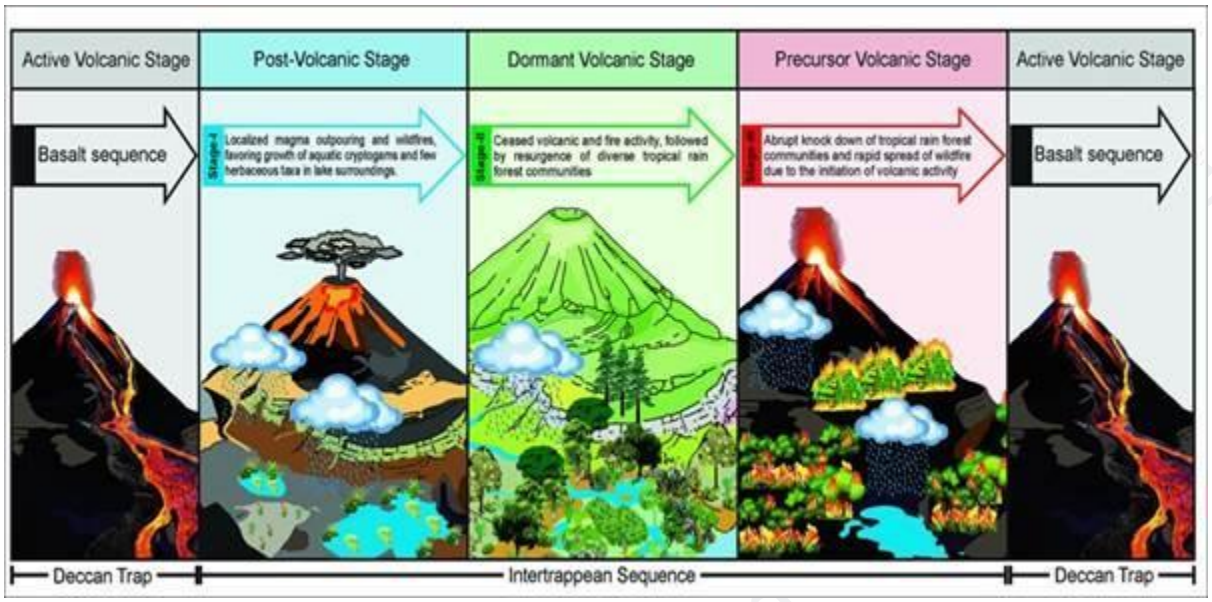

Figure 1: Simplified palaeovegetational model of floral succession inferred from palynology, palynofacies, NLR and CA for Yeotmal area.

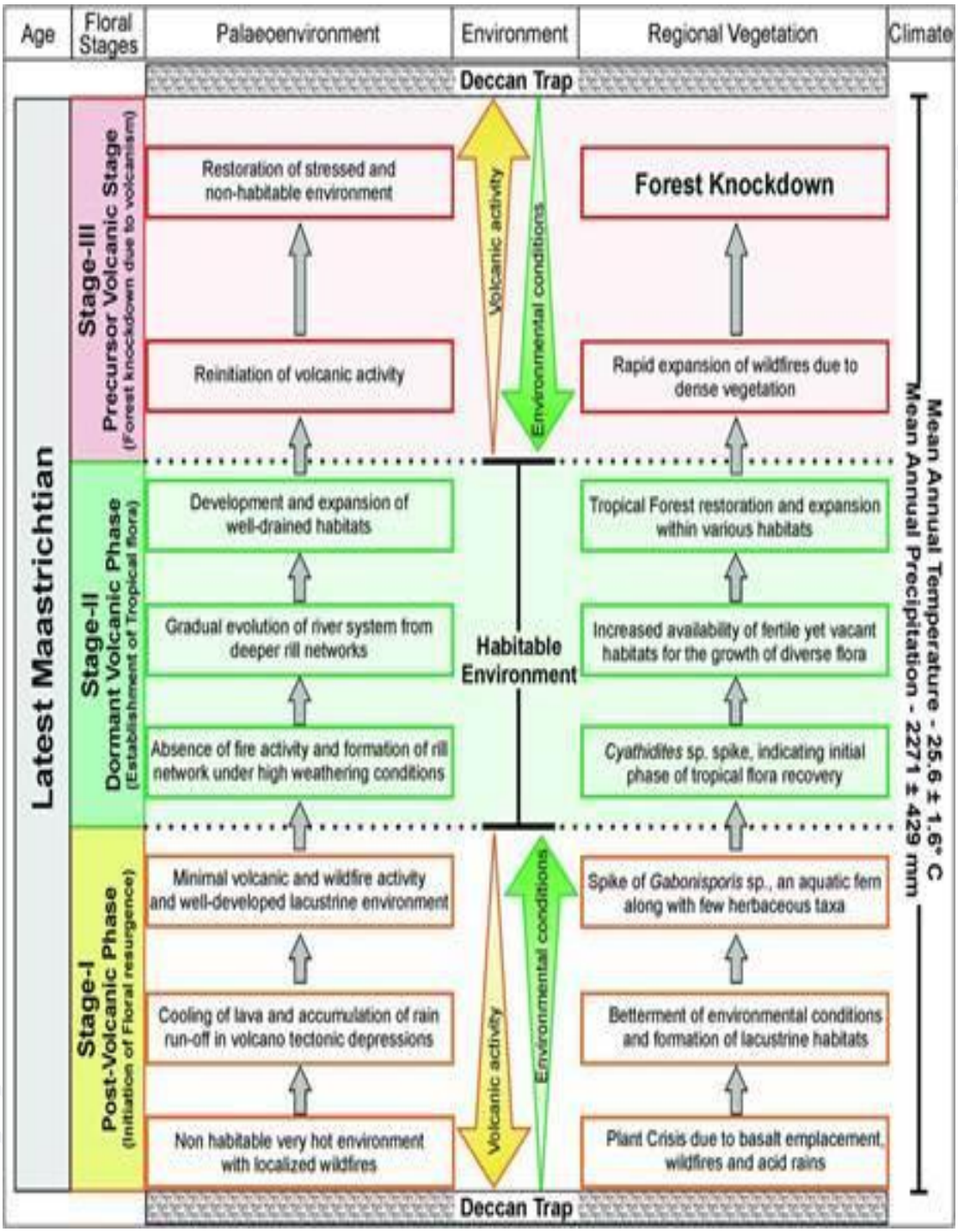

Figure 2: Flow chart of events showing stages of vegetation succession and environmental changes in relation to the Deccan Volcanism.

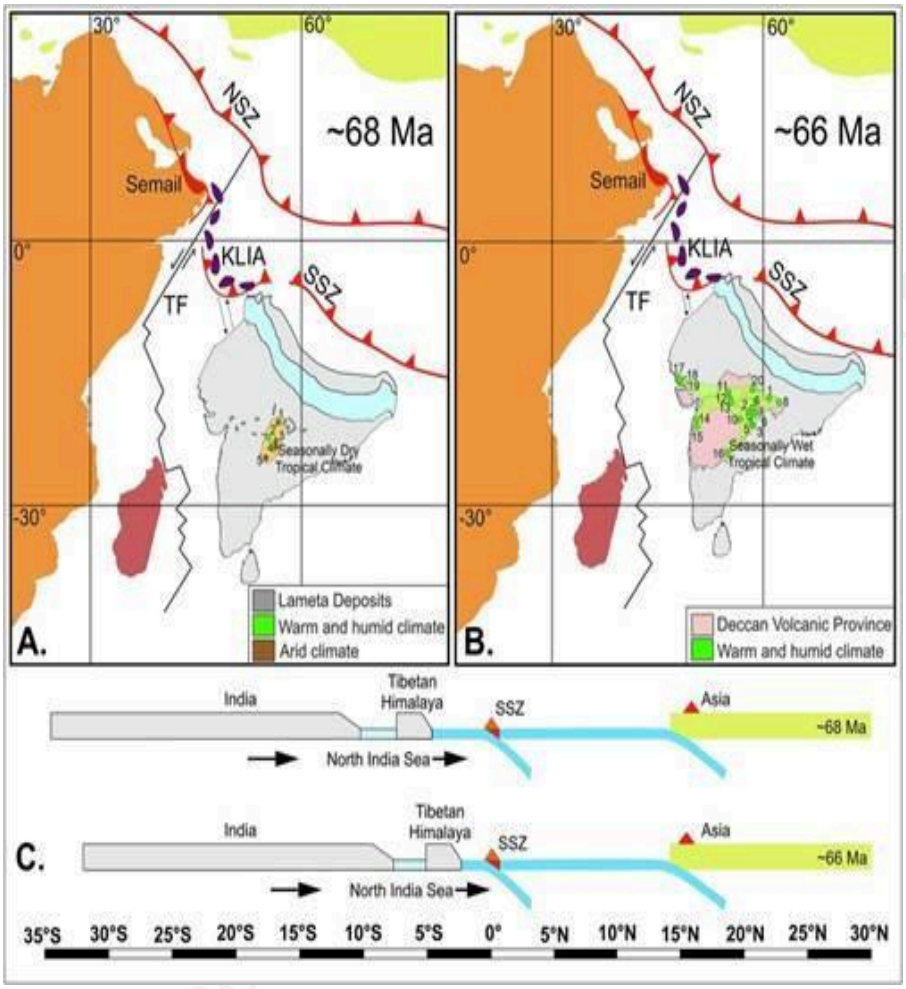

Fig. 3: ***(A-B).*** *The planar representation of the palaeogeographic and palaeoclimatic reconstruction, displaying KLIA as a biotic filter corridor connecting north-eastern Africa and northern India (after Rodriguez et al., 2021; Yuan et al., 2022: Geographic coordinates were referred from GPlates). Reconstruction at A. ca. 68 Myr. and B. ca. 66 Myr..* ***C.*** *Schematic representation of the Indian Plate movement at ca. 68 Myr and 66 Myr. Abbreviations: TF-Transform Fault, NSZ-Northern Subduction Zone, SSZ- Southern Subduction Zone, KLIA-Kohistan-Ladakh Arc, 1- Jabalpur, 2-Nagpur, 3-Nand-Dongargaon, 4- Pisdura, 5-Chandrapur, 6-Chindwara, 7-Mohgaonkalan, 8-Dindori, 9-Nawargaon, 10-Yeotmal, 11-Dhar, 12-Dhangaon, 13-Betul, 14-Raigad, 15-Mahabaleshwar, 16-Naskal, 17-Kutch, 18- Lakshmipur, 19-Anjar, 20-Sagar.*

Reference

Press Information Bureau: **Tropical Flora showed significant resilience**

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