

Palynological Perspective on Understanding Climate Change in India Over the Pre-industrial Common Era (CE; Past Ca. 2000 Years): a Comprehensive Review and a Critical Evaluation



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Abstract Palynology (and pollen analysis) has proven to be a reliable tool in reconstructing the past vegetation (dynamics) and contemporary climatic changes. The chapter reviews the role of pollen in reconstructing the palaeoclimate in India over the pre-industrial Common Era (CE; past ca. 2000 years [2 ka]; past 2 millennia; Late Holocene), comprising the global climatic events, such as the Roman Warm Period (RWP), Dark Ages Cold Period (DACP), Medieval Climate Anomaly (MCA), Little Ice Age (LIA) and the Current Warm Period (CWP). In addition, the hydro-climatic variability, which influences the socio-economic welfare of one-third of the human population through the agricultural output and Gross Domestic Product (GDP) of this densely-populated country, are also analyzed. This chapter also discusses the solar forcing and the other forcing factors behind the hydroclimatic variability during the past 2 millennia in India.

Keywords Palynology · Climate change · Common Era (CE) · Hydro-climate variability · Indian Summer Monsoon (ISM) · Solar forcing · Inter Tropical Convergence Zone (ITCZ) · India

1 Introduction

Vegetation (the sum total of all the plants/plant population growing in an area or covering a region) plays a pivotal role as a reservoir for Earth's climate. Consequently, studies that utilize vegetation to glean insights into past climates stand as potent and reliable methods for comprehending climate change and hydroclimatic changes/variability/fluctuations. In the context of India, monsoonal dynamics

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