Reappraisal of Permian and Early Triassic Palynoflora and Palynostratigraphy of Son-Mahanadi Basin and Their Climatic Implications

Srikanta Murthy, Anju Saxena, Sankar Suresh Kumar Pillai, and Suyash Gupta

Abstract Coal bearing Gondwana sequences of the peninsular India have been extensively studied for plant fossils since late nineteenth century. Over the years, ample amount of data has been generated enriching our understanding of past vegetation, its evolution, proliferation, decline and subsequent extinction during the Permian and Triassic periods. Palaeofloristic studies are imperative to understand the vegetation dynamics and biostratigraphy of Lower Gondwana and Triassic sediments as these are mostly devoid of widespread characteristics faunal remains except some rare occurrences. The present paper elucidates a reassessment of the palaeobotanical studies pertaining to Permian and Triassic sequences primarily focusing on palynological work with a glimpse of macrofloral studies and their implications in deducing the biostratigraphy, palaeoclimate and the palaeoenvironment of the Son-Mahanadi Basin. Like any other Gondawan basin, Permian Gondwana sequences of this basin are also characterized with the elements of Glossopteris flora that marked their first appearance during the earliest Permian (Talchir Formation) after the late Carboniferous deglaciation and gradually evolved and proliferated across the Permian encompassing Karharbari, Barakar, Barren Measures and Raniganj (= lower Kamthi formation) formations and ultimately got extinct during the early Triassic and succeeded by the appearance and diversification of *Dicroidium* flora during the Triassic. Attempts have been made to provide a detailed synthesis of the past vegetation and associated palaeoclimate prevalent during the deposition of each of the above mentioned formations and their biostratigraphic implications.

1 Introduction

Gondwana sediments in India, occur mainly along the five master Gondwana Basins in peninsular India. Almost 99% of coal resource for the country is from these Gondwana Basins. These basins are found along major river valleys either as separate

S. Murthy · A. Saxena (✉) · S. S. K. Pillai · S. Gupta
Birbal Sahni Institute of Palaeosciences, 53-University Road, Lucknow 226007, India
e-mail: anju_saxena@bsip.res.in; anju_saxena2002@yahoo.co.in

B. Samant and D. Thakre (eds.), *Applications of Palynology in Stratigraphy and Climate Studies*, Society of Earth Scientists Series, https://doi.org/10.1007/978-3-031-51877-5_3