

Society of Earth Scientists Series

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Mesozoic Stratigraphy of India

A Multi-Proxy Approach



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Cite this chapter

Kotha, M. (2021). An Overview of the Mesozoic (Middle Jurassic to Early Cretaceous) Stratigraphy, Sedimentology and Depositional Environments of the Kachchh Mainland, Gujarat, India. In: Banerjee, S., Sarkar, S. (eds) Mesozoic Stratigraphy of India. Society of Earth Scientists Series. Springer, Cham. https://doi.org/10.1007/978-3-030-71370-6_4

Download citation

[.RIS](#) [.ENW](#) [.BIB](#)

DOI

https://doi.org/10.1007/978-3-030-71370-6_4

Published

03 August 2021

Publisher Name

Springer, Cham

Print ISBN

978-3-030-71369-0

Online ISBN

978-3-030-71370-6

eBook Packages

[Earth and Environmental
Science](#)

[Earth and Environmental
Science \(R0\)](#)

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Chapter | First Online: 03 August 2021

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Mahender Kotha 

 Part of the book series: [Society of Earth Scientists Series](#) ((SESS))

 555 Accesses

Abstract

The Mesozoic rocks in the Kachchh Basin, with their varied lithological characters and depositional facies, have been a focus of geologists' attention since the pioneering work of Wynne and Fedden in 1872–74, more than a century ago. The prolific megafauna, especially the Upper Jurassic ammonites, of the Mesozoic succession of Kachchh is well known globally that attracted paleontologists, while the wide range of condensed sections exposing Bathonian to Pleistocene drew the stratigraphers' attention. The Jurassic ammonite fauna of Kachchh is essential for its regional significance and broad provincial interest. Although an excellent volume of data is available on the Jurassic succession of India, most of that focus attention on paleontology and stratigraphy. The varied depositional, erosional, and biogenic structures present in the Mesozoic sequence of Kachchh are quite interesting. The exposed Mesozoic sequence of Kachchh Mainland consists of rocks ranging from Middle Jurassic to Early Cretaceous, is divided into four formations viz. Jhurio, Jumara, Jhuran, and Bhuj in ascending order. The Jhurio and Jumara formations, belonging to Middle Jurassic, represent a mixed carbonate–clastic sequence, while the Jhuran Formation (Late Jurassic) and Bhuj Formation (Early Cretaceous) comprises an essentially clastic succession. In all, 13 lithofacies associations with varying depositional conditions are observed from the entire exposed Mesozoic succession of Kachchh Mainland. Sandstone and shales are the dominant lithologies of the succession, while the carbonate rocks occur only to the Middle Jurassic exposures. Petrographically, the sandstones belong to the predominant quartz arenite to feldspathic arenite categories, followed by a few lithic arenites, and the associated carbonate lithologies belong to a variety of types, ranging from mudstone to grainstones, and exhibit a variable microfacies character and diagenetic modifications. The present work highlights an overview of the sedimentological account of the Mesozoic succession of Kachchh Mainland and discusses the distribution of the variety of clastic and carbonate facies types and their use of the paleoenvironmental reconstruction for understanding the paleogeography of Kachchh Basin.