GSW62264: Sedimentary Textural Analysis of Rohtas Limestone and Kaimur Sandstone in Rohtas District, Bihar

Shambhavi Singh*, Dinesh Kumar and Rabindra Kumar
Dept. of Geology, Patna Science College (PU), Patna, India
*Email ID: : ghungharu.9.online@gmail.com

Abstract

The examination of the evolution of Proterozoic basins worldwide sparks curiosity as it enhances our comprehension of the Earth's current state. From the initial formation of the Earth's crust to its present-day thickness, our planet has undoubtedly undergone a remarkable journey. The basement is composed of severely distorted igneous and metamorphosed rocks from the Archean era. Over time, various geological processes influenced these rocks, leading to the creation and deposition of new basins and sediments. This period also witnessed significant events such as the Great Oxygenation Event, the emergence of microbial life, and the formation of sediments from the existing rocks, thereby contributing

to the expansion of the lithospheric extension. These newly formed sediments were stratified under various climatic conditions, depths of seas and oceans, fluviatile, lacustrine, and other geomorphic processes. They serve as a record of the first sedimentary rocks found all over the world. Consequently, they also provide information about the prevailing conditions during that time. The deposited sediments not only offer insights into the rocks themselves but also reveal details about their depositional environment, the extent of land and sea, rivers, wind patterns, climatic patterns, and the presence or absence of important elements from our atmosphere. This information can be further compared and analyzed to study a different set of data. Additionally, the sediments contain fossils and traces of ancient life forms. It is worth noting that different Proterozoic basins exhibit distinct characteristics, including variations in the nature and type of sediments as well as the level of deformation they have undergone. The Vindhyan Supergroup is a significant Proterozoic or Purana Basin in India, both in terms of geography and geology. It overlays the Bundelkhand Granite Massifs and spans over 100,000 sq. km. in Central India, stretching from Sasaram, Bihar in the east to Chittorgarh, Rajasthan in the west, and Dholpur (Rajasthan) in the north. This study focuses on the depositional setting and sedimentary textural analysis of the Rohtas Limestone, which is the uppermost layer of the Semri Group (Lower Vindhyans), and the Lower Kaimur Sandstones, which form the basement of the Kaimur Group (Upper Vindhyans) in Rohtas District, Bihar. Although unconformities are not highly prominent, there is a noticeable change in the nature of the depositional setting and the type of rocks in certain areas. Therefore, this research not only contributes to the examination of the depositional environment and origin of the region, but the data can also be utilized for comparison with other Proterozoic basins.

Keywords: Sedimentary textural analysis, Vindhyan Supergroup, Rohtas limestone, Kaimur sandstone Rohtas