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PHANEROZOIC HISTORY OF ANTARCTICA AND INDIA: AN INSIGHT FROM CONJUGATE RIFT BASINS

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Antarctica formed the core of Gondwanaland. Therefore to understand the major tectonics of the Antarctica, the relevant data set from these countries should be examined in conjunction with data from Antarctica. The Lambert Glacier is the most prominent landform of the eastern Antarctica. It extends for more than 650 km from its northern coast over the East Antarctic shield. The exposed rocks in these regions are at least 5–6 km of Permian–Triassic–Cretaceous sediments. As this part of Antarctica was supposed to be juxtaposed with the east coast of India, the northeast–southwest orientation of the Prydz Bay basin is suggested to be influenced by rifting between India and Antarctica. The east coast of India is also characterized by contemporary Gondwana rift valleys which are known as the Godavari, and the Mahanadi rift valleys of almost same length (500–600 km). Prior to the breakup of India from Antarctica, the Lambert and the Mahanadi Rift basins were located in line with each other and were supposed to form the conjugate structures on two continents. There are several hypotheses for the origin and evolution of these faulting dominated volcano-sedimentary conjugate basins. Some workers argue a single - rift related evolution of these basins while others propose multiple-rift model. Further, it is still uncertain whether the sedimentation occurred within a broad rift zone or in smaller channel like basins. Hence, the problem of origin of these rift basins and their volcano-sedimentary evolution is still a contentious issue. The gravity and the total intensity magnetic anomalies of the Lambert Glacier and the Amery ice shelf of Antarctica and that of the Mahanadi basin of India are compared constraining from available seismic studies to delineate the shallow and the deep seated crustal structures. To evaluate the distribution of ages of sediments and to identify their source regions, geochronological and stable isotope data from the sediments from the two basins is reviewed. Finally, integration of geophysical and geological information is used to provide new insight into the Phanerozoic history of Antarctica and India by tackling the larger questions concerning the generation of the conjugate continental rifts.