

Tectonic evolution of the foreland basin systems in the Himalayan orogeny

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Three foreland basin systems related to the India-Asia collision, from North to South these include the Gangdese retroarc foreland basin, Tsangpo peripheral foreland basin and the southern Himalayan Siwalik foreland basin. Compare with the almost continuous intact Gangdese retroarc and Siwalik foreland basin, the syn-collision Tsangpo foreland basin was fragmented by the Himalayan fold-thrust systems, which composed of many small relic basins scattered in the Tethyan Himalaya and less Himalaya synclines, such as Sangdanlin-Gangzi basin, Gangba-Dingri basin, Central Nepal basin and Siang valley basin. Just the southern of Yarlung-Zangbo suture zone, a suite of Paleocene-early Eocene deep-water sequences was recognized recently in Saga and Gyangze areas. The Paleocene-Early Eocene strata of the Sangdanlin basin show the characteristics of a typical foreland basin with an overall upward coarsening trend (Ding, 2003; Ding et al. 2005; Cai et al., 2011).

It is suggested that there is a peripheral foreland basin located along the entire length of the sub-Himalaya as result of flexural loading of the high and less Himalaya. The sediments of the sub-Himalayan basin are composed of upper Oligo-Miocene and younger alluvial strata and the lower Paleocene-Eocene Marine strata. The upper parts deposits in the foredeep depozone of Himalayan foreland basin. However we argue that the lower part deposit in a backbulge depozone may belong to a foreland basin in the north of Himalaya. In the northern of the Gangdese Arc, it is suggested that there is a retroarc foreland basin located along the entire length of the northern Gangdese arc, rather than an extensional basin widely accepted by previous researchers (Zhang et al., 2011). The research progresses on the three above foreland basins in the Gangdese-Himalayan orogen belt enormously promote our understanding about the subduction processes of the Neo-Tethys Ocean and the following collision between India and Asia.

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