

The Cambro-Ordovician Orogenic Cycle in the Himalayan Chain: Comparison and Relationships with the Evolution of the Continental Margin of Eastern Gondwana (Antarctica and Australia)

POSTER

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During the Cambrian, the Himalayan domain was bordering one of the major continental masses forming the Gondwana supercontinent. In fact the western border of the Indian-Australian block was separated from an Asiatic fragment (Tibet micro-plate) by a wide continental shelf with connected outer basin. Terrigenous to carbonate peritidal facies recorded a transgressive trend, in a passive continental margin setting. Consequently, in the middle-late Cambrian, turbidites and basaltic tuffites were poured in a deep water basin, in front of an arc-trench system (Kurgikh Formation). The sedimentary sequence was uplifted and transformed into chain (Late Pan-African event?) and thereafter eroded giving alluvial fan conglomerates and braid-plain sandstones in middle Ordovician time (Thaplè Formation).

A similar carbonate lower to middle Cambrian deposition characterised the eastern continental margin of Gondwanaland. In both the Ross Orogen (Antarctica) and Delamerian Orogen (South Australia), the sequences contain thick, Archeocyath-bearing carbonates called the Shackleton Limestone and the Normanville Group, respectively. Even if there is no evidence of regional continuity, these rocks prove the existence of a continental shelf flanking this sector of the Cambrian Gondwana. Shelf-continental slope-island arc refers to the sediments and associated intrusive and extrusive rocks of Australia, New Zealand, Tasmania and Antarctica.

The orogenic cycle began with the sinking of the shelf, followed by turbidite systems, locally interbedded with tuffaceous material (Kurgikh Formation in Himalaya, Kanmantoo Group in Australia, Priestley Formation, Sledgers, Mariner and Robertson Bay Groups in northern Victoria Land-Antarctica and other equivalent sequences). The terrigenous sedimentation was supplied either from detritic discharges coming from the continental block and from the carbonatic shelf. A great part of the continental margins of Gondwanaland were consequently uplifted and eroded. Ordovician post-orogenic molasse-like and alluvial deposits cover unconformably the remnants of the chain (Thaplè Formation in Himalaya, Brown Ridge Conglomerate-Crashsite Quartzite-Leap Year Group in different domains of Antarctica).

The correspondence of events caused a surprising affinity and correlation among the Cambro-Ordovician sequences even located at the opposite borders of Gondwanaland. The persistence of faunas of warm climate in carbonate shelf environment, gives moreover paleogeographic constraints: both the regions remained within the tropical carbonate development zone.

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