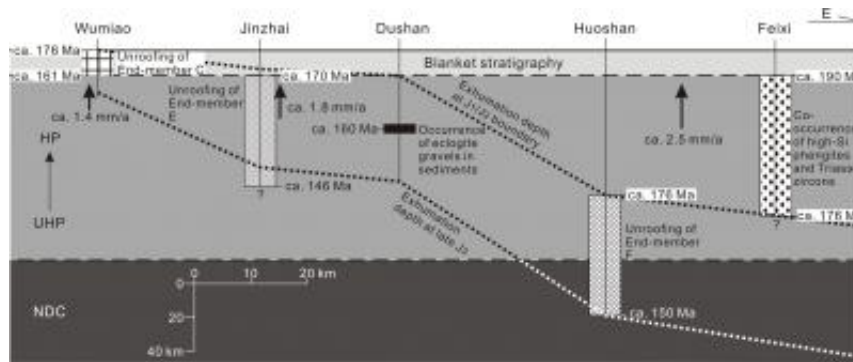


How can basin rocks recorded formation of Dabie orogen?

March 22 2013



This is a simplified map showing the spatial distribution of the representative end member or eclogite gravels, high-Si phengites, and Triassic zircons that were exhumated in the source area. This map was organized according to provenance analysis results of stratigraphic sections in the Hefei basin, which demonstrate the depth of exhumation increasing from west to east, the unroofing ages of the UHP and HP metamorphic rocks changing from Early Jurassic to Late Jurassic westward, and eastward increasing exhumation rate in the Dabie orogen during the Jurassic. Credit: Science China Press

Deep subduction of continental crust and rapid exhumation of ultrahigh-pressure metamorphic rocks, and its mechanism have been one of the most important issues of the world's attention in the Dabie orogen. Professor LIU Shaofeng from State Key Laboratory of Geological Processes and Mineral Resources, China University of Geosciences (Beijing) and his co-author set out to tackle this problem. Their study results fully demonstrated that basin sediments recorded Dabie

formation process and supplied important trails for Dabie uplifting and exhumation. Their work, entitled "Mesozoic basin development and its indication of collisional orogeny in the Dabie orogen", was published in *Chinese Science Bulletin* 2013, 58.

Dabie orogen was formed by collision between the South China and North China plates. During and after collision periods, sedimentary basins were developed beside and within the mountains, in which the sediments sourced from Dabie were filled. These sedimentary strata, like "historical book", recorded the [geological processes](#) of subduction of the South China plate under the North China plate and then rapid uplift and unroofing of the subducted South China plate. Therefore, it is effective to probe into Dabie Mountains formation based on [basin](#) sedimentary stratigraphic analysis.

These newly studies have shown a fundamental progress. The Dabie orogen records gradual transition from overall shortening and thrusting to dominantly extension and [rift basin](#) formation expanded from its core to its margins, although these shortening and extension overlapped in time from the Jurassic through Early Cretaceous at crustal levels. The unroofing ages of the ultra-high pressure metamorphic rocks subducted into hundreds kilometers deep in the Dabie orogen change from Early Jurassic to Late Jurassic westward. The depth of exhumation increases eastwards (Fig. 1). The sediment sources for the basin in the north are mostly composed of the deeply exhumed, axial Dabie metamorphic complex, and the sediment sources for the basin in the south are mostly from cover strata in the southern orogen and related strata with subjacent (i.e. subsequently overthrust) plate suture belt.

Geodynamic analysis represents that continental collision between the North China Block and the South China Block along the plate sutures, subsequently northwestward progradation of the Jiangnan fold and thrust belt, and the underthrusting of the North China Block along the Northern

Boundary Fault of Qinling Range led to crustal thickening, gravitational spreading and balanced rebound of the resultant thick crustal welt, and multi-episodic exhumation of the HP/UHP metamorphic rocks.

This work will be a valued reference of probing into how sedimentary basins record tectonic evolution of the orogenic belt which underwent deep continental subduction, rapid [exhumation](#), and the huge amount of erosion. Furthermore, it will be significant to reveal the evolution of basin/mountain system and geodynamics.

Provided by Science China Press

Citation: How can basin rocks recorded formation of Dabie orogen? (2013, March 22) retrieved 24 May 2024 from <https://phys.org/news/2013-03-basin-formation-dabie-orogen.html>

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