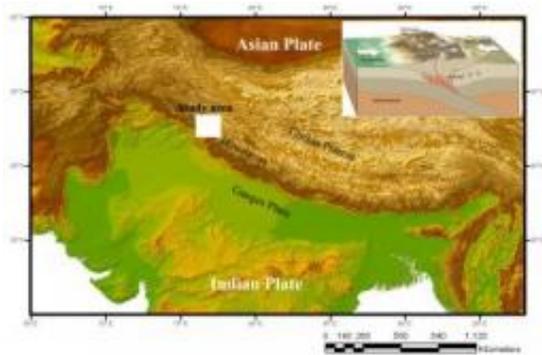


Deep subduction of the Indian continental crust beneath Asia

May 28 2010



The map shows the location of the study area in the Himalayas. Inset: A schematic shows the Indian plate subducting beneath the Asian plate. Credit: NOC

Geological investigations in the Himalayas have revealed evidence that when India and Asia collided some 90 million years ago, the continental crust of the Indian tectonic plate was forced down under the Asian plate, sinking down into the Earth's mantle to a depth of at least 200 km kilometers.

"The subduction of [continental crust](#) to this depth has never been reported in the [Himalayas](#) and is also extremely rare in the rest of world," said Dr Anju Pandey of the National Oceanography Centre in Southampton, who led the research.

Pandey and her colleagues used sophisticated analytical techniques to demonstrate the occurrence of relict majorite, a variety of mineral garnet, in rocks collected from the Himalayas.

Majorite is stable only under ultra-high pressure conditions, meaning that they must have been formed very deep down in the Earth's crust, before the subducted material was exhumed millions of years later.

"Our findings are significant because researchers have disagreed about the depth of subduction of the Indian plate beneath Asia," said Pandey.

In fact, the previous depth estimates conflicted with estimates based on computer models. The new results suggest that the leading edge of the Indian plate sank to a depth around double that of previous estimates.

"Our results are backed up by computer modelling and will radically improve our understanding of the subduction of the Indian continental crust beneath the Himalayas," said Pandey.

The new discovery is also set to modify several fundamental parameters of Himalayan [tectonics](#), such as the rate of Himalayan uplift, angle, and subduction of the Indian plate.

The new research findings were published this month in the journal *Geology*.

More information: Pandey, A, Leech, M., Milton, A., Singh, P. & Verma, P. K. Evidence of former majoritic garnet in Himalayan eclogite points to 200-km-deep subduction of Indian continental crust. *Geology* 38, 399-402 (2010). [doi:10.1130/G30584.1](https://doi.org/10.1130/G30584.1)

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