Remnant Neo-Tethyan ocean from the Ladakh Himalaya: constraints on their nature, age and tectonic setting

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The Indus and Shyok Suture Zones represent the remnants of the Neo-Tethyan ocean in terms of Nidar arc volcanics and Zildat ophiolitic melange in the eastern Ladakh, Dras Arc volcanics and Shergol ophiolitic melange in the western Ladakh along the Indus Suture Zone. The Shyok-Nubra ophiolitic volcanics of the northern Shyok suture zone, north of the Ladakh batholith, represent the remnant northern portion of the Neo-Tethyan. The Nidar-Dras arc volcanics represent intra oceanic arc that developed as the Indian plate was moving northwards around 140 My ago. These units preserve arc tholeiite, representing primitive arc which passed on to calc alkaline series as the arc matured. These rocks are characterised by depleted nature in terms of incompatible trace elements including rare earth elements and Sm-Nd isotopic characteristics. The Zildat-Shergol ophiolitic melanges are represented by N-MORB and Ocean Island Basalt (OIB) characteristics. These units have also preserved exotic blocks of limestone, physically mixed with other units of the ophiolitic melange.

The Shyok-Nubra volcanics are represented by enriched trace elements and isotopic characteristics, very different from those of the Indus Suture zone. They don't preserve ophiolitic melange, as observed in the Indus suture zone. Our tectonic model indicate double subduction of the Neo-Tethyan ocean, in the north it got subducted under the Tibetan plate giving rise to Andean type continental arc along the Shyok suture zone. In the south the Neo-Tethyan ocean got subducted under the same oceanic crust giving rise the intra-oceanic Mariana type subduction.

Thus, in the Ladakh Himalaya there is preservation of almost all components of the Neo-Tethyan ocean preserving the N-MORB and OIB type magmatism in the melange zone. The Andean and Mariana type arc components indicating very different tectonic settings. Neo-Tethyan ocean appear to have all the components that we observe presently in the Pacific-Atlantic ocean. These data will be presented and elaborated during my presentation.

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