

## Accretionary prism in frontal range of collision zone--An example of 1.68 Ga rocks in Miocene Siwalik Belt, Himalaya

# Harutaka Sakai[1], Yutaka Takigami[2]

[1] Earth Sci., Kyushu Univ, [2] Kanto Gakuen Univ.

An accretionary prism of the Middle Proterozoic rocks was discovered from the Miocene Siwalik Belt in the Himalayan front. The prism is exotic thrust packages off-scraped from the supra-continental rocks of the subducting Indian sub-continent. The thrust belt is 3km wide and extends for more than 30 km along the Himalayan arc. A dolerite sill in the package shows an Ar-Ar plateau age of 1.68 Ga. Within the belt, tectonic slices are repeated three to five times due to thrusts, sandwiching a thin slice of the Siwalik beds.

The Siwalik Belt is a frontal fold-thrust belt of the Himalayas and composed of thick sequence of foreland basin sediments derived from the Himalayas during the last 15 to 17 million years. From this Miocene belt in the central Nepal, we discovered exotic thrust packages of the Middle Proterozoic rocks, which has been regarded as the Siwalik Group or post-collisional sediments correlatable with the Subathu or Murree Formation in India.

The thrust belt, called the Bagmati Belt, is narrowly distributed in the Siwalik Belt, 22 km to the north of the Main Frontal Thrust (MFT or HFF) that is an active fault and considered to be the deformation front of the Himalayan orogen. The Main Boundary Thrust (MBT) which separates the Siwalik Belt from the Lesser Himalayan Belt runs 7 km to the north of the thrust packages. Within the belt, tectonic slices of 400 m to 1 km in thickness are repeated three to five times due to thrusts, sandwiching a thin slice of the Siwalik beds.

The thrust package consists of the pre-Siwalik sedimentary rocks and sills of dolerite, and named as the Bagmati Group. The thickness is only about 800 m due to tectonic repetition by thrust, although the group has been considered to be a continuous sequence attaining 2200 m in thickness.

The  $^{40}\text{Ar}/^{39}\text{Ar}$  analysis of a whole rock dolerite sample collected from the Dwar Khola, gave a plateau age of  $1682 \pm 4$  Ma.

It is noteworthy that one of the thrust sheets of the Lower Siwalik Group is sandwiched in between the Proterozoic thrust sheets and the other is thrust up on the Upper Siwalik beds. These facts indicate that the imbrication of the Bagmati Group and the Siwalik Group has occurred after the deposition of the Late Miocene Middle Siwalik beds.

No metamorphic minerals can be detected both in the dolerite and aeolian beds. The existence of non-devitrified glassy volcanics and fresh clinopyroxene in the dolerite demonstrates that the Bagmati Group has undergone neither metamorphism nor strong deformation for about 1700 m.y.

If our model is correct, a part of the Deccan Traps on the Indian shield will be off-scraped to form exotic thrust packages along the Himalayan front in future.