Geology and Geodynamics of Shillong Plateau, NE India

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The Shillong Plateau in north eastern India is an uplifted block bound by major faults like the E-W trending Dauki fault in the south, Brahmaputra graben and Oldham fault in the north, Jamuna fault in the west and NW-SE Kopili in the east. The basement gneissic complex of Shillong Plateau consists of two mica gneisses, cordierite-mesoperthite gneisses and amphibolites of Archean age and suffered more than one deformational event. High grade rocks are represented by acid charnockites, basic granulites and calc-silicate rocks are spread over most of the basement. The southern parts of Shillong plateau consist of Cretaceous-Tertiary rocks of Khasi, Jaintia and Garo Group of sediments. Proterozoic Shillong group of sediments covers considerable part of central and eastern Shillong Plateau.

A number of mafic intrusives like dolerites, norites, lamprophyres, pyroxenites and amphibolites are emplaced in NW-SE, N-S and NE-SW directions. A number of discordant granite plutons of 500-650 Ma intrude the basement gneisses and Shillong Group of sediments. Dolerite dykes are porphyritic and the phenocrysts consists of clusters of euhedral, strongly zoned plagioclase (An_{57-65}) and clinopyroxene (Ca_{42-48} Fe_{14-16} Mg_{35-43}) and rarely orthopyroxene (Mg_{81-84} Fe_{16-20}). Lamprophyre dykes show typical panidiomorphic texture and consists of phlogopite, amphibole, augite, olivine and opaque. Rb-Sr isotopic analysis of phlogopite from lamprophyres yield 113$\pm$ 10 Ma, which is similar to ages of Rajmahal and Sylhet traps. Amphibolites show wide range of geochemical characteristics in their major, trace and rare earth element concentration and suggest them to be more than one source of origin.

There is a lack of adequate isotopic and geochemical data due to which the evolution of the Shillong Plateau is still not well known. The Shillong Plateau occupies a unique position in the Precambrian history of north east India. Different ideas were put forward to reconstruct the Shillong Plateau which suggest that it represents the north east wedge of Peninsular India uplifted and moved to the east over a long distance about 250 km along E-W Dauki fault or variously interpreted as a internal part of the Eastern Ghat Mobile Belt. The Shillong Plateau migrated northwards associated with antilockwise rotation along with the Indian subcontinent during the upper Cretaceous period and the Shillong Plateau situated at

the extreme eastern margin of the antilockwise rotating Indian subcontinent and is not having enough room to make anticlockwise rotating and hence rotated in clockwise direction as revealed by north east declinations of the Jaintia group of sediments. The present position of Shillong Plateau may be interpreted as prevailing complex geological events such as Kergulean plume related magmatism, rift related mechanism and its position on the colliding edge behaved like a microplate.