

## THE DISPLACEMENT DIRECTION OF THE ARENA GNEISS IN CENTRAL SRI LANKA (ABSTRACT)

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The Precambrian terrain of Sri Lanka is generally divided into a granulite-facies terrain (Highland Complex: HC) and two amphibolite-facies terrains (Vijayan Complex: VC and Wannai Complex: WC) which are arranged zonally from west to east: WC-HC-VC. As suggested by published gravity data (G. BÜCHEL; *Precambrian Res.*, **66**, 77, 1994), and structures around the contact (R. KLEINSCHRODT; *Precambrian Res.*, **66**, 39, 1994), the HC and the VC are separated by a thrust boundary such that the former is superposed on the latter. However, the relationship between the HC and the WC has not well been constrained. Therefore, it is necessary to establish a distinct relationship between them for the better understanding of the fundamental structure of the Sri Lankan Precambrian, as well as of the tectonic evolution of East Gondwana surrounding Sri Lanka.

The amphibolite-facies migmatitic gneisses are distributed in the south-central part of HC. These gneisses mainly occur in basin structures and are called the Arena Gneiss (AG). Because the petrologic characters of the AG indicate affinity to the rocks of the WC, the relationship between the AG and the HC is considered to be a "key" for the solution as to the relationship between the HC and the WC.

Deformation structures of the AG are composed of D1, D2, D3 and D4 structures from the oldest to the youngest. On the other hand, structures of the HC are composed of those formed during Dh1, Dh2, Dh3 and Dh4 deformational stages. Dh2, Dh3 and Dh4 structures show good similarities with those of D2, D3 and D4 respectively, whereas Dh1 and D1 show dissimilarity in the direction of hinges of intrafolial isoclinal fold. These facts, along with discontinuity of key beds as well as large-scale structures, and dissimilarities of lithology, metamorphism, Sm-Nd model age data between the AG and the HC which have been documented so far, indicate that the AG is allochthonous to the HC.

The following kinematic indicators suggesting the simple shear deformation are observed in the AG: C and S fabrics, asymmetric feldspar phenocrysts, and asymmetric small folds. These geometries show dextral shear sense at outcrops with eastward dipping banding structure; whereas they indicate sinistral shear sense at localities where banding structure is inclined westward. This contrasting shear sense is formed by major folding belonging the D3 deformation. On the other hand, the above asymmetric structures disturb the banding structure belonging the D1 deformation. Therefore, these asymmetric structures were formed during or just before the D2/Dh2 deformation.

These geometries are considered to be related to the displacement of the AG, showing top-to-the-SSE movement direction of the AG. The above mentioned observations suggest that the WC may have thrust over the HC with top-to-the-SSE displacement direction during or just before the D2/Dh2 deformation. The relationship between the WC and the HC as evidenced above, along with the known east-vergent thrust boundary between the HC and the VC, suggest that the principal geologic structure of the Sri Lankan Precambrian is characterized by piled nappes.

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