

Very large synforms and antiforms in the Highland Series of the Sri Lanka crustal basement

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The southern part of the Highland Series consists of flat-lying, layered sediments and basic and granitic sills. They are all strongly flattened parallel to bedding and stretched in a NNW direction. This original state is overprinted on the rest of the Highland Series and in the Southwestern Group by very large synforms and antiforms. They are the fourth and last folds in the structural development. Synforms are broad, antiforms narrow. The biggest synforms reach wavelengths of 10 km and 50 km along strike.

Axial planes are subvertical; the axes are parallel to first stretching and plunge towards depressions. Numerous cm- to 100 m folds overfold towards the hinges of the big folds. Their axes are parallel to major axes near their plunging ends, but highly variable at synform centres. There they may become subvertical. Minor fold axes are parallel to local stretching. A new cleavage forms and becomes penetrative in strongly deformed parts. Layering suffers strong flattening beyond that produced by preceding S_1 and re-thickening at hinges.

South of Kandy, these fold axes plunge to the north and flat-lying granulite facies footwall rocks are exposed, which were warped only gently in the same act. There, grain-reorientation produced by F_4 , s_4 , str_4 gradually disappears and features produced by preceding flattening and stretching survive.

The big folds have formed after the climax of metamorphism and T had dropped for at least 100° C when they formed. They fold an originally higher level with amphibolite facies, only preserved within the synforms, and a lower level with granulite facies, coming out in antiforms. In lower parts of the synforms, granulite facies with lower T compared to peak conditions persist during F_4 -folding. No significant T redistribution after folding of these levels can be detected. In the higher level, strong partial melting assists F_4 deformation. In the lower granulite facies level the crust had preserved a high bending strength.