

Uplift history of the Ou Backbone Range: Implications for a revised Late Cenozoic tectonic model of Northeast Japan

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This study attempts to review the uplift history of the Ou Backbone Range, based on the reconstruction of uplift history of a sedimentary basin; the Yuda Basin located in the axial part of the Ou Backbone Range. The subsidence analysis of the Yuda Basin based on the detailed mapping and fission-track dating has revealed the more complex stepwise uplift of the Ou Backbone Range than previously supposed. Three stages of uplift have been recognized and are interpreted to be the result of compressional stress, possibly accompanied by basin inversion. The three stages are identified as (1) a phase of uplift of the eastern sector and regional unconformity (12 - 9 Ma), (2) a stage of differential uplift and compression (6 - 1.5 Ma) and (3) a phase of intense uplift with an angular unconformity followed by a gentle uplift (1.5 Ma ? Present). Although Middle to Late Miocene has been regarded as a tectonically quiet period in Northeast Japan, the first and second tectonic events at ~10 Ma and 6Ma ~, respectively are supposed to have a regional origin because coeval tectonic events took place across Northeast Japan. The subsidence / uplift history of the axial basin also suggests that the rate of uplift after ~ 1 Ma may have been significantly smaller than the previous estimate (~ 0.5 mm/yr) based on the fluvial terraces. This study also indicates that the Ou Backbone Range may have experienced several "climax" stages of uplift during the past 12Ma when the rate of uplift might be higher than that at present. The study thus provides implications for reevaluation of history and activities of active faults along the Ou Backbone Range as well as for a revised Late Cenozoic tectonic model of Northeast Japan.