Geology of the Upper Tama Kosi/Rolwaling Valley Region, east-central Nepal

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The Tama Kosi/Rolwaling area of east-central Nepal is underlain by the exhumed mid-crustal core of the Himalaya. The uppermost portion of the Tama Kosi valley has not been mapped previously and as such this study represents an important piece in completing our basic geologic knowledge within the Himalaya. The geology of the area consists of anatectite-bearing Greater Himalayan sequence phyllitic schist, paragneiss and orthogneiss that generally increases in metamorphic grade and anatectite content up structural section. The top of the Greater Himalayan sequence in the map-area is intruded by an undeformed, pegmatitic leucogranite stock. Relationships in adjacent areas constrain the age of similar leucogranite to be older than middle Miocene (Jessup and Cottle, 2010). Preliminary U-Th-Pb geochronologic analyses indicate monazite growth in the Greater Himalayan sequence during the early and middle Miocene in kyanite and sillimanite grade rocks, and during the late Miocene in staurolite grade rocks. It is not yet known how this growth relates to the metamorphic and anatectic episodes recorded in the study area. All metamorphic rocks are pervasively deformed and commonly record top-to-the-south sense shear. In contrast to previous studies that have overlapped with portions of the present study (Ishida, 1969; Ishida and Ohta, 1973; Schelling,1992), the Main Central thrust fault is not mapped in the study-area; it is interpreted to crop-out farther to the south. The entire exhumed midcrustal package has been subject to late-stage folding during the formation of the Tama Kosi window, a structural culmination that may reflect out-of-sequence adjustment of the orogenic wedge or, alternatively, an inversion of primary basin morphology (Long et al., 2011).

References

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