Late Cenozoic tectonic evolution of the Ailao Shan-Red River fault (SE Tibet): implications for kinematic change during plateau growth

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...view

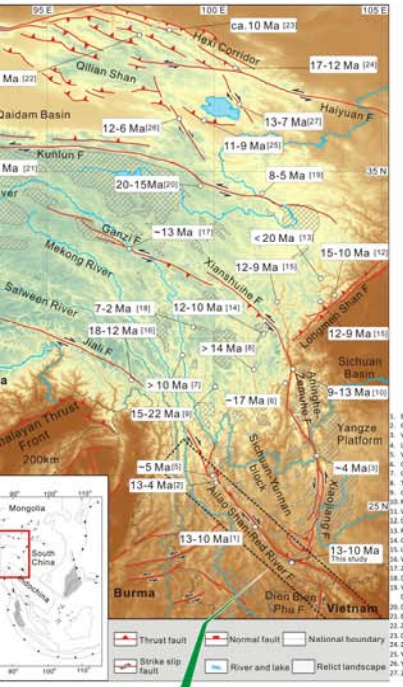
...nt new sedimentary, structural and thermochronologic ...the Ailao Shan-Red River fault; these reveal the time ...re of its evolution.

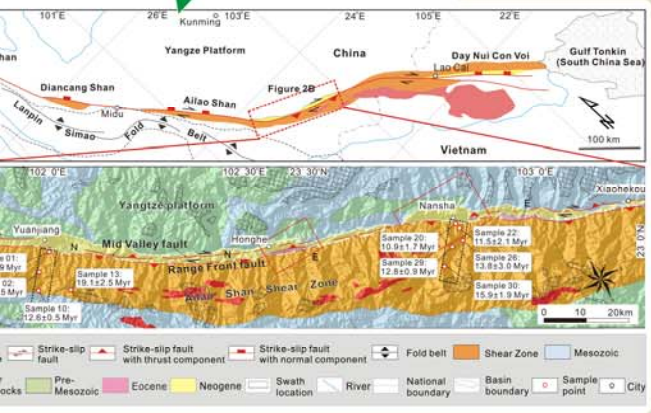
...shows:

...jor bend" changed from a sinistral releasing bend to a ...g bend after right-lateral reactivation along the Red ...lt.

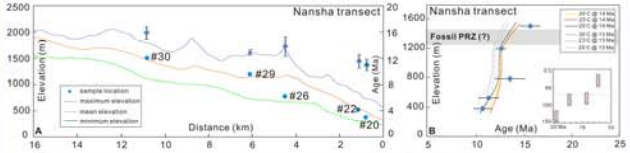
...ses of rapid exhumation occurred along the shear zone ...ocene.

...y site: Ailao Shan-Red River fault

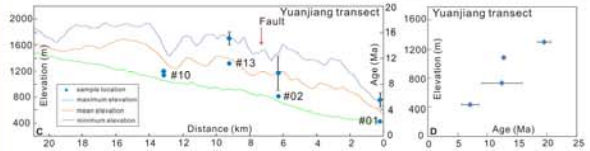




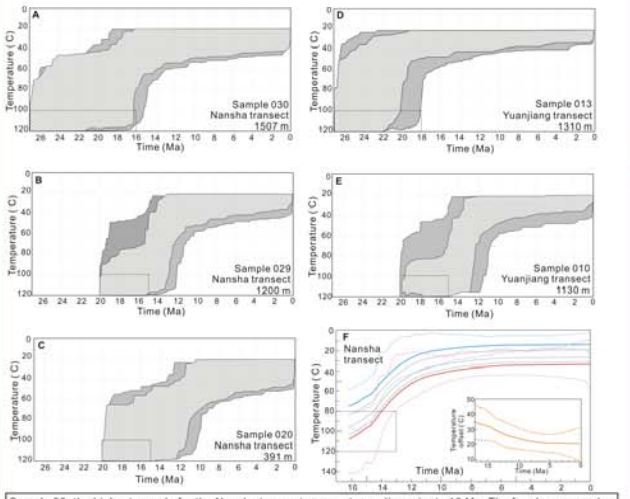
3. Apatite (U-Th)/He thermochronometry



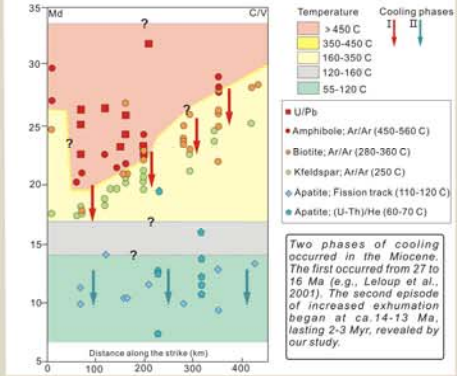
Samples of the Nansha transect yield AHe ages ranging from 10.9±1.7 to 15.9±1.9 Ma. A steeper trend in age/elevation plot beginning at 13 Ma, lasting 2-3 Myr, indicates accelerated cooling. The forward model thermal history is consistent with the age/elevation data.



Ahe ages in the Yuanjiang transect range from 19.1±2.5 Ma at 1310 m to 7.0±2.9 Ma at the base of the transect (434 m).



Sample 30, the highest sample for the Nansha transect, suggest a cooling prior to 16 Ma. The four lower samples reveal similar thermal histories, and collectively indicate a later cooling interval that began at 14-13 Ma and lasted 2-3 Myr. Model results for the Yuanjiang transect suggest a similar thermal history with the Nansha transect. Data of multiple samples in the Nansha transect were also models in the QTQt program, showing similar results. This

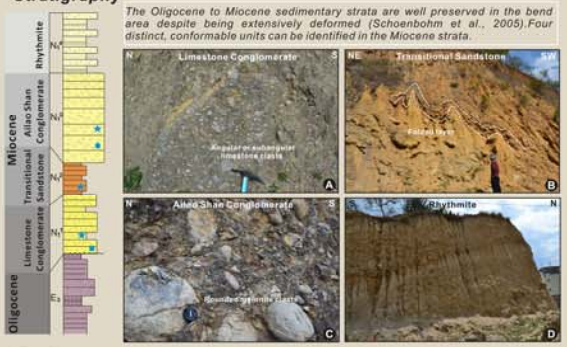


Two phases of cooling occurred in the Miocene. The first occurred from 27 to 16 Ma (e.g., Leloup et al., 2001). The second episode of increased exhumation began at ca.14-13 Ma, lasting 2-3 Myr, revealed by our study.

4. Basin analysis

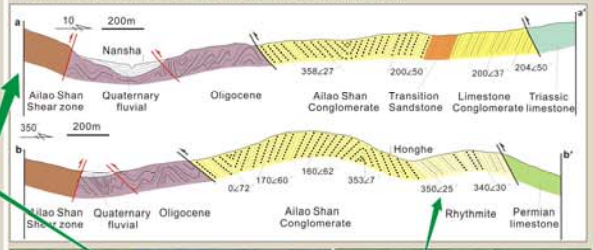
Stratigraphy

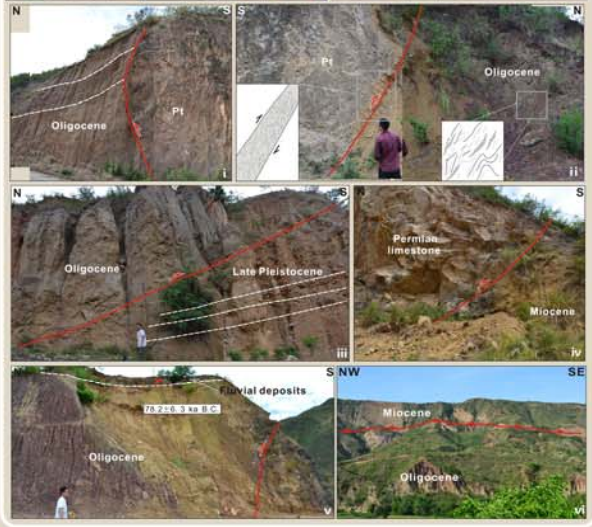
The Oligocene to Miocene sedimentary strata are well preserved in the bend area despite being extensively deformed (Schoenbohm et al., 2005).Four distinct, conformable units can be identified in the Miocene strata.



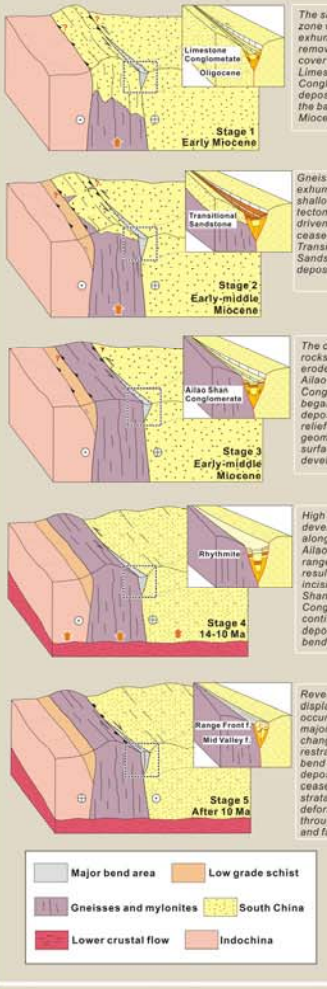
Structure

The Oligocene and Miocene strata are overthrust by bedrock on both sides. Miocene strata form as folds. The axial planes are nearly E-W trending. The Red River fault consists of two parallel strands in the major bend area, the Range Front fault and Mid Valley fault (Allen et al., 1984; Replumaz et al., 2001.Schoenbohm et al., 2006). both reveal apparent thrust components.





5. Structural evolution in the late Cenozoic



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to Dr. Bo Zhang. We also thank Dr. Lin Wu for help collecting Apatite (U-Th)/He data.

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