

地質学セミナー

Geology seminar

Date: Feb. 15, 2012 Time: 17:00
Seminar room 110, Laboratory of
Advanced Research B

Paleoearthquake investigations of the Mae Hong Son Fault in Mae La Noi area, Mae Hong Son province, northern Thailand

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The collision between Indian and Eurasian plates since the late Paleogene causes the NW-SE and NE-SW strike-slip faults and the N-S dip-slip faults in the Indochina region. In the Mae Hong Son province, northern Thailand, several fault lines trend in the NE-SW, NW-SE and N-S directions, and are temporally and spatially associated with Cenozoic basin. Previous remote sensing investigation reveals many lines of morphotectonic evidence along the Mae Hong Son Fault which suggest an active tectonic zone. In order to clarify tectonic activity of this region, we selected the Mae Hong Son Fault as a target (fault) for paleoearthquake investigation.

Remote sensing techniques and aerial photograph interpretation were applied to a study of the Mae Hong Son Fault. The Mae Hong Son Fault mainly strikes N-S, with a set of conjugate faults of some major NW-SE and minor NE-SW faults. The N-S faults show a normal dip-slip, and bound the margins of the N-S elongate basins which might result from the movement of large-scale strike-slip fault in this region. The NW-SE and NE-SW faults show right-lateral strike-slip and left-lateral strike-slip movement, respectively. Essential morphotectonic landforms associated with the Mae Hong Son Fault are fault scarps, offset streams, linear valleys, shutter ridges, triangular facets, hot springs, and linear mountain fronts.

At the Mae La Noi area, the significant morphotectonic landforms such as fault scarps, offset streams, and linear valley were observed along the NE-SW Mae La Noi segment of the Mae Hong Son Fault. Two paleoearthquake events of this fault segment were observed in the quarry using results on OSL age dating data; the older event occurred before 20,000 years ago, and the younger event occurred between 8,300 and 7,800 years ago (Fig. 1). An average rate of the last fault movement was 0.14 mm/yr. It is concluded that the Mae Hong Son Fault is still active till present, and the Mae La Noi segment is regarded as the active segment with the oblique movement (i.e., a combination of reverse and left-lateral strike-slip faults).

Fig.1 Stratigraphy and age data at the Mae La Noi municipality school quarry. Unit A: gravel, sand and clay; Unit B: clay and sand; Unit C: gravel, sand, and clay, with sand lens; Unit D: sandy clay with gravel; Unit E: clayey sand with gravel; Unit F: gravel, sand and clay; Unit G: sandy clay with gravel; Unit H: gravel and sand; and Unit I: top soil. The point marked "x" indicates the location where gravel of unit G is not cut by the fault.

