

Mesozoic intra-continental progressive evolution in middle-upper Yangtze region of China: Evidence from thermochronology and balanced cross-section

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The geometrical evolution of the 400 km wide middle-upper Yangtze thrust belt from western Hunan-Hubei to eastern Sichuan has been established over a time interval of 118 Ma. Based on FT and balanced cross-section analytic results (Tables 1 & 2), we have suggested that the Mesozoic

Sample	ρ_s ($10^5/cm$)	ρ_i ($10^5/cm$)	T(Ma)
1-1	6.25(2197)	19.31(917)	198.4±10.4
1-2	25.54(894)	13.77(482)	154.1±10.2
1-3	228.0(35)	24.0(30)	93.4±23.5
1-4	1.881(523)	4.525(1258)	88.2±8.6
1-5	3..297(511)	8.006(1241)	84.9±5.1
1-6	9.762(812)	21.194(1763)	80.3±4.7

Table 1: Fission track analytic results of apatite

Section	Time (Ma)	Shortening (km/%)	Shortening rate(mm/a)
western Hun.-Hub.	52.9 (198.4-145.5)	35.2/13.6	0.67
east sec. of east Sich.	45.9 (145.5-99.6)	32.6/21.2	0.71
west sec. of east Sich.	19.3 (99.6-80.3)	10.4/19.9	0.54

Table 2: Analytic results of balanced cross-section

intra-continental evolution of the belt is progressive from SE to NW (from western Hunan-Hubei to eastern Sichuan), and the deformation process is younger and younger and shortening is less and less, respectively. Other viewpoints about the belt had previously been discussed by Hsu and Yan [1, 2].

[1] Hsu (1988) *Geology* **16**, 418-421. [2] Yan *et al.* (1996) *Tectonophysics* **361**, 239-254.

The concentrations of REE in agricultural soils and its use for tracing the geographic origin of vegetable oils

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Tracing the geographic of food has become an increasing economic factor. In this respect, stable light isotope ratios have been used to identify the geographic origin of food products. There have attempts with radiogenic isotopes (e.g. Pb, Sr, Nd etc.) and trace element distribution patterns as potential indicators.

In this work we used REE distributions of edible oils, in particular of pumpkin seed oil, a local specialty protected by the EU. From several geographic regions samples were taken from the topsoil, the pumpkin meat, the seeds and the oil extracted from the seeds (Soxhlet) and oil produced from these seeds in a local pumpkin oil mill. The sample locals are from Lower Austria and Styria, Serbia, Hungary, Russia and also from China.

The important outcome of this study is that the distribution patterns of the oils follow that of the continental crust. The chondrite normalized REE patterns of soils do show regional differences. But the most interesting observations is that the regional variation of the REE distributions of the extracted oils is much larger than the those of the soils. In addition we find Ce and Gd anomalies, but the latter only related to the Styrian region. Since REE are non essential elements for plants, our original hypothesis, that the REE distribution patterns reflect that of soils substrate has be falsified. Nevertheless, the patterns do show regional differences, which could be used for tracing the geographic origin but no reason can be given for this observation.