

## 科研队伍

- 两院院士
- 科研人员
- 杰出青年
- 百人计划

## 丁仲礼个人主页

- 英文主页
- 个人简介
- 研究项目
- 论文著作

## 站内搜索

搜索

关键字



### 个人简介

丁仲礼 中国科学院地质与地球物理研究所研究员

2005年当选中国科学院院士

2006年当选发展中国家科学院院士

中国IGBP主席、国际IGBP-PAGES科学指导委员会委员

国际科技数据委员会中国国家委员会主席

国际山地中心委员

国际黄土委员会委员

国际新近纪/第四纪界线工作组成员

中国第四纪委员会理事长

Palaeogeography Palaeoclimatology Palaeoecology编委

联系电话：010-82998301

2008年1月，任中国科学院副院长

1999年5月-2007年7月，中国科学院地质与地球物理研究所研究员、常务副所长、所长

1989年12月-1990年7月，加拿大Alberta大学地质系访问学者，研究方向为黄土—古土壤的古气候学

1988年8月-1999年5月，中国科学院地质研究所助理研究员、副研究员、研究员

1985年9月-1988年7月，中国科学院地质研究所获理学博士学位

1982年9月-1985年7月，中国科学院地质研究所获理学硕士学位

1978年9月-1982年7月，浙江大学地质系地球化学专业获学士学位

### 主要成果

迄今为止，以第一作者发表SCI论文26篇。据不完全统计，第一作者论文被引次数超过1000次，为ISI Geosciences的Top 1%高引用率作者之一。部分成果还被编入英美出版的古气候学教科书。主要成果包括：

1、详细划分中国黄土地层，并进行对比

中国黄土是全球范围内第四纪古气候变化最重要的记录之一。对黄土高原各区域的地层分布特征进行了较深入的调查，并对几个有代表性的剖面进行了古地磁年代测定。提出一套黄土地层的土壤地

层学划分方案；对宝鸡、渭南、西安、洛川、西峰等黄土剖面进行了详细的划分与对比，首次提出将中国黄土地层划分成37个土壤地层单位，并证明每个土壤地层单位至少可在三个剖面间进行对比，厘定了中国黄土地层单元。这些工作首次证明了中国黄土作为第四纪气候变化陆相沉积记录的连续性与完整性，进一步确立了中国黄土在全球变化研究上的重要地位。

#### 2、确定黄土地层所记录的三个古气候转型事件，并检出地球轨道周期

通过高分辨率古气候曲线的研究发现中国黄土记录了三个大的古气候转型事件，分别出现在

2.6MaBP、1.6MaBP和0.8MaBP附近。通过频谱分析进一步发现了中国黄土以40万年、10万年、4.1万年、2.3万年和1.9万年的周期记录为主，同地球轨道周期具很好的一致性。2.6Ma附近的转型事件表现为气候变化从持续温暖间以小的波动转化为出现大的频繁的冷暖波动，这个事件以红粘土发育转变成黄土大面积堆积为特征；1.6Ma附近的转型事件表现为气候变化的主导周期不明显转化为以4.1万年的周期成分为主；0.8Ma附近的转型事件表现为气候变化从4.1万年的主导周期转化为10万年的主导周期。通过和深海记录的对比，从理论上提出：黄土所记录的古气候变化同全球冰量变化，尤其是高纬度冰盖变化存在着阶段性的耦合过程，而这种过程可能同青藏高原的阶段性的隆升有关。

#### 3、建立了一条完整的第四纪陆相沉积地球轨道时标

通过黄土高原5个完整剖面的地层和粒度曲线的严格对比，证实了黄土沉积记录轨道尺度气候事件的连续性，并构建了每个剖面的轨道参数调谐时间标尺，最终获得2.6 Ma以来有区域代表性的黄土粒度集成时间序列（Chiloparts）。该时间标尺为其它第四纪沉积记录提供了重要的参考标准。

#### 4、初步探讨了东亚古季风变化的动力机制

多年的研究发现：（1）东亚夏季风同西南季风不同，前者在布容期以10万年的周期为主，后者以4万年和2万年的周期为主；（2）黄土记录的气候变化相对于全球冰量变化，存在着千年数量级的相位滞后；（3）东亚冬、夏季风具同相位，同周期变化特征。根据这三条证据提出：东亚季风变化主要是由全球冰量，尤其是大陆冰盖变化所控制的，而西南季风变化则主要由太阳辐射变化直接控制。大陆冰盖对东亚气候变化的控制是通过对西伯利亚高压的控制起作用的。

#### 5、将中国北方连续的风成沉积从2.6 Ma下推到约8.0 Ma

通过对中国北方新近纪红粘土序列的地层学、沉积学和地球化学的研究，确立了红粘土的风成成因，并将中国北方连续的风成沉积从2.6 Ma下推到8.0 Ma。在此基础上，通过分析红粘土的各种指标，初步恢复了晚新近纪黄土高原的气候演变历史。

1. Ding, Z. L., Rutter, N. W., Han, J. T., and Liu, T. S., A coupled environmental system formed at about 2.5Ma in East Asia, *Palaeogeography, Palaeoclimatology, Palaeoecology*, 94(1992), 223-242.
2. Ding, Z. L., Rutter, N. W., and Liu, T. S., Pedostratigraphy of Chinese loess deposits and climatic cycles in the last 2.5Myr, *Catena*, 20(1993), 73-91.
3. Ding, Z. L., Yu, Z. W., Rutter, N. W., and Liu, T. S., Towards an orbital time scale for Chinese loess deposits, *Quaternary Science Reviews*, 13(1994), 39-70.
4. Ding, Z. L., Liu, T. S., Rutter, N. W., Yu, Z. W., Zhu, R. X., and Guo, Z. T., Ice-volume forcing of the East Asia winter monsoon variation in the past 800,000 years, *Quaternary Research*, 44(1995), 149-158.
5. Ding, Zhongli, Rutter, Nat, and Liu, Tungsheng, The onset of extensive loess deposition around the G/M boundary in China and its palaeoclimatic implications, *Quaternary International*, 40(1997), 53-60.
6. Ding, Z. L., Rutter, N. W., Liu, T. S., Sun, J. M., Ren, J. Z., Rokosh, D., and Xiong, S. F., Correlation of Dansgaard-Oeschger cycles between Greenland ice and Chinese loess, *Paleoclimates*, 2(1998), 281-291.
7. Ding, Z. L., Sun, J. M., Liu, T. S., Zhu, R. X., Yang, S. L., and Guo, B., Wind-blown origin of the Pliocene red clay formation in central Loess Plateau, China, *Earth and Planetary Science Letters*, 161(1998), 135-143.
8. Ding, Z. L., Sun, J. M., Yang, S. L., and Liu, T. S., Preliminary magnetostratigraphy of a thick eolian red clay-Loess sequence at Lingtai, the Chinese Loess Plateau, *Geophysical Research Letters*, 25(1998), 1225-1228.
9. Ding, Z. L., Sun, J. M., Rutter, N. W., Rokosh, D., and Liu, T. S., Changes in sand content of loess deposits along a north-south transect of the Chinese Loess Plateau and the implications for desert variations, *Quaternary Research*, 52(1999), 56-62.
10. Ding, Z. L., Ren, J. Z., Yang, S. L., and Liu, T. S., Climate instability during the penultimate glaciation: Evidence from two high-resolution loess records, China, *Journal of Geophysical Research*, 104(1999), 20123-20132.
11. Ding, Z. L., Xiong, S. F., Sun, J. M., Yang, S. L., Gu, Z. Y., and Liu, T. S., Pedostratigraphy and paleomagnetism of a ~7.0 Ma eolian loess-red clay sequence at Lingtai, Loess Plateau, north-central China and the implications for paleomonsoon evolution, *Palaeogeography, Palaeoclimatology, Palaeoecology*, 152(1999), 49-66.
12. Ding, Z. L., Yang, S. L., C3/C4 vegetation evolution over the last 7.0 Myr in the Chinese Loess Plateau: evidence from pedogenic carbonate  $\delta^{13}C$ . *Palaeogeography, Palaeoclimatology, Palaeoecology*, 160(2000), 291-299.
13. Ding, Z. L., Rutter, N. W., Sun, J. M., Yang, S. L., and Liu, T. S., Re-arrangement of atmospheric circulation at about 2.6Ma over northern China: evidence from grain size records of loess-paleosol and red clay sequences, *Quaternary Science Reviews*, 19

(2000), 547-558.

14. Ding, Z. L., Sun, J. M., Yang, S. L., and Liu, T. S., Geochemistry of the Pliocene red clay formation in the Chinese Loess Plateau and implications for its origin, source provenance and paleoclimate change, *Geochimica et Cosmochimica Acta*, 65(2001), 901-913.
15. Ding, Z. L., Yang, S. L., Hou, S. S., Wang, X., Chen, Z., Liu, T. S., Magnetostratigraphy and sedimentology of the Jingchuan red clay section and correlation of the Tertiary eolian red clay sediments of the Chinese Loess Plateau. *Journal of Geophysical Research*, 106(2001), 6399-6407.
16. Ding, Z. L., Yu, Z. W., Yang, S. L., Sun, J. M., Xiong, S. F., and Liu, T. S., Coeval changes in grain size and sedimentation rate of eolian loess, the Chinese Loess Plateau, *Geophysical Research Letters*, 28(2001), 2097-2100.
17. Ding, Z. L., Yang, S. L., Sun, J. M., Liu, T. S., Iron geochemistry of loess and red clay deposits in the Chinese Loess Plateau and implications for long-term Asian monsoon evolution in the last 7.0 Ma, *Earth and Planetary Science Letters*, 185(2001), 99-109.
18. Ding, Z. L., Derbyshire, E., Yang, S. L., Yu, Z. W., Xiong, S. F., and Liu, T. S., Stacked 2.6-Ma grain size record from the Chinese loess based on five sections and correlation with the deep-sea  $\delta^{18}O$  record, *Paleoceanography*, 17(2002), 5-1--5-21.
19. Ding, Z. L., Ranov, V., Yang, S. L., Finaev, A., Han, J. M., Wang, G. A., The loess record in southern Tajikistan and correlation with Chinese loess. *Earth and Planetary Science Letters*, 200(2002), 387-400.
20. Ding, Z. L., Derbyshire, E., Yang, S. L., Sun, J. M., Liu, T. S., Stepwise expansion of desert environment across northern China in the past 3.5 Ma and implications for monsoon evolution. *Earth and Planetary Science Letters*, 237(2005), 45-55.
21. Ding, Z. L., Liu, T. S., Liu, X. M., Chen, M. Y., and An, Z. S., Thirty seven climatic cycles in the last 2.5Ma, *Chinese Science Bulletin*, 35(1990), 668-671.
22. Ding, Z. L., *Pedostratigraphy of Chinese loess and Quaternary climatic fluctuation, Quaternary Geology and Environment in China*, edited by Liu T.S., Science Press, (1991), 168-172.
23. Ding, Z. L., Han, J. T., Liu, C., and Liu, T. S., Preliminary determination of an abrupt climatic shift around 2.5Ma in northern China, *Chinese Science Bulletin*, 36 (1991), 852-856.
24. Ding, Z. L., Rutter, N. W., Liu, T. S., Evans, M. E., and Wang, Y. C., Climatic correlation between Chinese loess and deep-sea cores: a structural approach. *Loess, Environment and Global Change*, edited by Liu, T. S., Science Press, (1991), 168-186.
25. Ding, Z. L., Liu, T. S., Loess-soil stratigraphy in China and bearings on climatic history in the last 2.5Ma, *Advances in Geoscience* (2), (1992), China Ocean Press, 390-

26. Ding, Z. L., Liu, D. S., Climatic correlation between Chinese loess and deep-sea cores in the last 1.8Ma, *Chinese Science Bulletin*, 37(1992), 217-220.
27. Ding, Zhongli, Correlation of climatic periodicities between loess and deep sea records in the past 2.5 Ma, *Advances in Solid Earth Sciences*, edited by Pang, Zhonghe et al., Science Press, (1996), 59-63.
28. Ding, Z. L., Liu, T. S., Forcing mechanisms for East-Asia monsoon variations during the late Pleistocene, *Chinese Science Bulletin*, 43(1998), 1497-1510.
29. Ding, Z. L., Sun, J. M., Yu, Z. W., and Liu, D. S., Chronology of environmental events over East-Asia during the past 130 ka, *Chinese Science Bulletin*, 43(1998), 1761-1770.
30. Ding, Zhongli, Sun, Jimin, and Liu, Dongsheng, A sedimentological proxy indicator linking changes in loess and deserts in the Quaternary, *Science in China (Series D)*, 42(1999), 146-152.
31. Ding, Zhongli, Sun, Jimin, and Liu, Tungsheng, Stepwise advance of the Mu Us desert since late Pliocene: Evidence from a red clay-loess record, *Chinese Science Bulletin*, 44(1999), 1211-1214.
32. Liu, T. S., Ding, Z. L., Chen, M. Y., and An, Z. S., The global surface energy system and geological role of wind stress, *Quaternary International*, 1/2(1989), 42-55.
33. Rutter, N. W., Ding, Z. L., Evans, M. E., and Liu, T. S., Magnetostratigraphy of the Baoji loess-paleosol section in the north-central China, *Quaternary International*, 7/8(1990), 97-102.
34. Rutter, N. W., Ding, Z. L., Liu, T. S., Comparison of isotope stages 1-61 with the Baoji-type pedostratigraphic section of north-central China, *Canadian Journal of Earth Sciences*, 28 (1991), 985-990.
35. Rutter, N. W., Ding, Z. L., and Liu, T. S., Comparison of isotope stages 1-61, *Canadian Journal of Earth Sciences*, 28(1991), 958-963.
36. Rutter, N. W., Ding, Z. L., Evans, M. E., and Liu, T. S., Baoji-type pedostratigraphic section, Loess Plateau, north-central China, *Quaternary Science Reviews*, 10(1991), 1-22.
37. Liu, T. S., Ding, Z. L., Stepwise coupling of monsoon circulations to global ice volume variations during the late Cenozoic, *Global and Planetary Changes*, 7(1993), 119-130.
38. Liu, T. S., Ding, Z. L., Yu, Z. W., and Rutter, N. W., Susceptibility time series of the Baoji section and the bearings on paleoclimatic periodicities in the last 2.5Ma, *Quaternary International*, 17(1993), 33-38.
39. Rutter, N. W., Ding, Z. L., Paleoclimates and monsoon variations interpreted from micromorphogenic features of the Baoji paleosols, China, *Quaternary Science Reviews*,

12(1993), 853-862.

40. Zhu, R. X., Ding, Z. L., Wu, H. N., and Li, C. Y., Details of magnetic polarity transition recorded in Chinese loess, *Journal of Geomagnetism and Geoelectricity*, 45 (1993), 289-299..

41. Rutter, N. W., Ding, Z. L., and Liu, T. S., Reliability of grain size variation as a climatic proxy and correlation method for loess-paleosol units, north-central China, *International Conference on Geology, Geotechnology and Mineral Resources, Thailand*, (1995), 45-52.

42. Liu, T. S., Ding, Z. L., Chinese loess and the paleomonsoon, *Annual Reviews of Earth and Planetary Sciences*, 26(1998), 111-145.

43. Sun, J. M., Ding, Z. L., Liu, T. S., Desert distributions during the glacial maximum and climatic optimum: Example of China, *Episodes*, 21(1998), 28-31.

44. Sun, J. M., Ding, Z. L., Deposits and soils of the past 130,000 years at the desert-loess transition in northern China, *Quaternary Research*, 50(1998), 148-156.

45. Yu, Z. W., Ding, Z. L., An automatic orbital tuning method for paleoclimate records, *Geophysical Research Letters*, 25(1998), 4525-4528.

46. Liu, T. S., Ding, Z. L., and Rutter, N.W., Comparison of Milankovitch periods between continental loess and deep sea records over the last 2.5 Ma, *Quaternary Science Reviews*, 18(1999), 1205-1212.

47. Sun, J. M., Ding, Z. L., Liu, T. S., Rokosh, D., and Rutter, N., 580,000 year environmental reconstruction from eolian deposits at the Mu Us desert margin, China, *Quaternary Science Reviews*, 18(1999), 1351-1364.

48. Xiong, Shangfa, Ding, Zhongli, and Liu, Tungsheng, Climatic implications of loess deposits from the Beijing region, *Journal of Quaternary Science*, 16(2001), 575-582.

49. Xiong, Shangfa, Ding, Zhongli, and Yang, Shiling, Abrupt shifts in the late Cenozoic environment of north-western China recorded in loess-palaeosol-red clay sequences, *Terra Nova*, 13(2001), 376-381.

50. Xiong, Shangfa, Ding, Zhongli, Liu, Tungsheng, and Zhang, Jingzhao, East Asian monsoon instability at the stage 5a/4 transition, *Boreas*, 31(2002), 126-132.

51. Xiong, S. F., Ding, Z. L., Jiang, W. Y., Yang, S. L., and Liu, T. S., Initial intensification of East Asian winter monsoon at about 2.75 Ma as seen in the Chinese eolian loess-red clay deposit, *Geophysical Research Letters*, 30(2003), Vol. 30, No. 10, 1524, doi: 10.1029/2003GL017059.

52. Xiong, S. F., Ding, Z. L., Jiang, W. Y., Yang, S. L., and Liu, T. S., Damped fluctuations in Chinese loess grain size, *Geophysical Research Letters*, 30(2003), 2007, doi:10.1029/2003GL018187.

53. Yang, S. L., Ding, Z. L., Color reflectance of Chinese loess and its implications

for climate gradient changes during the last two glacial-interglacial cycles,  
Geophysical Research Letters, 30(2003), 2058, doi:10.1029/2003GL018346.

54. Yang, S. L., Ding, Z. L., Comparison of particle size characteristics of the Tertiary "red clay" and Pleistocene loess in the Chinese Loess Plateau: implications for origin and sources of the "red clay", Sedimentology, 51(2004), 77-93.

55. Jiang, H. C., Ding, Z. L., Temporal and spatial changes of vegetation cover on the Chinese Loess Plateau through the last glacial cycle: evidence from spore-pollen records, Review of Palaeobotany and Palynology, 133(2005), 23-37.

56. Yang, S.L., Ding, Z.L., Winter-spring precipitation as the principal control on predominance of C3 plants in Central Asia over the past 1.77 Myr: Evidence from  $\delta^{13}C$  of loess organic matter in Tajikistan, Palaeogeography, Palaeoclimatology, Palaeoecology, 235(2006), 330-339.

57. Jiang, H.C., Ding, Z.L., Xiong, S.F., Magnetostratigraphy of the Neogene Sikouzi section at Guyuan, Ningxia, China. Palaeogeography, Palaeoclimatology, Palaeoecology 243 (2007) 223-234.

58. Jiang, H.C., Ding, Z.L., A 20 Ma pollen record of East-Asian summer monsoon evolution from Guyuan, Ningxia, China. Palaeogeography, Palaeoclimatology, Palaeoecology 265, 30-38.

59. Yang, S. L., Ding, Z. L., Advance-retreat history of the East-Asian summer monsoon rainfall belt over northern China during the last two glacial-interglacial cycles. Earth and Planetary Science Letters, 274(2008), 499-510.