青藏高原东缘新生代构造层序与构造事件

李 勇[1] 侯中健[1] 司光影[1] A.L.Densmore[2] 周荣军[3]
M.A.Ellis[4] 李永昭[1] 梁兴中[1]

(1.成都理工学院沉积地质研究所,四川 成都 610059;2.Department of Geology,Trinity College,Dublin2 Ireland;
3.四川省地震局工程地质研究所,四川 成都 610041;4.Center for Earthquake Research and Information, University of Memphis, Memphis TN 38125,USA)

提要:新生代龙门山前陆盆地和盐源盆地是青藏高原东缘龙门山-锦屏山冲断带内及前缘地区发育和保存最好的新生代沉积盆地,本次以地层不整合面和ESR测年资料为主要依据,将该区新生代构造地层序列划分为5个构造层序,即TS1(65～55Ma)?TS2(40～50Ma)?TS3(23～16Ma)?TS4(4.7～1.6Ma)和TS5(0.74～0Ma),据此将青藏高原东缘新生代构造变形和隆升事件划分为5期,其中TS1与喜马拉雅地体和拉萨地体拼合事件相关,TS2与印亚碰撞事件相关,TS3与青藏高原第一次隆升事件相关,TS4与青藏高原第二次隆升事件相关,TS5与青藏高原第三次隆升事件相关?

关 键 词:新生代;构造层序;构造事件;龙门山-锦屏山;青藏高原东缘
中图分类号:P546 文献标识码:A 文章编号:1000-3657(2002)01-0030-07

Cenozoic tectonic sequence and tectonic events at the eastern margin of the Qinghai Tibet plateau

LI Yong[1], HOU Zhong-jian[1], SI Guang -ying[1], A. L. DENSMORE[2],
ZHOU Rong-jun[3], M. A. ELLIS[4], LI Yong -zhao[1], LIANG Xing-zhong[1]

(1.Institute of Sedimentary Geology, Chengdu University of Technology, Chengdu 610059, Sichuan, China;
2.Department of Geology, Trinity College, Dublin 2, Ireland;
3.Seismological Bureau of Sichuan, Chengdu 610059, Sichuan, China;
4.Center for Earthquake Research and Information, University of Memphis, Memphis TN 38125, USA)

Abstract:The eastern margin of the Qinghai-Tibet plateau can be divided into four tectonic units; from northwest to southeast, they are the Songpan-Garzê orogenic belt, Longmenshan-Jinpingshan thrust belt, foreland basin and Longquanshan forebulge, which are cut by the Xianshuihe fault. Cenozoic intermontane basins are developed in the inner part of the Longmenshan Jingpingshan thrust belt, and a foreland basin occurs along the frontal part of the thrust belt. The Cenozoic sedimentary record along the margin is a key to constraining the plateau uplift and evolution during the collision and continued convergence of India and Eurasia during the last 65Ma. Cenozoic sediments in the basin of the eastern margin can be classified into five tectonic sequences. Sequence 1 is composed of Paleocene to early Eocene red beds (65～55Ma) and represents a fining upward retrogressive cyclothem in the foreland basin, with alluvial fan sediments in the lower part and playa sediments in the upper part. Sequence 2 is composed of Middle-Late Eocene red beds (50～40Ma) and represents a retrogressive and progressiv ecyclothem in the Yanyuan intermontane basin, with alluvial fan sediments in the lower and upper parts and fluvial sediments in the middle. Sequence 3 is composed of Miocene coal bearing beds (23～16Ma) and represents a coarse-upward progressive cyclothem in the foreland basin, with alluvial fan and lacustrine sediments. Sequence 4 is composed of the Pliocene early Pleistocene Yanyuan Formation (4.29～2.58Ma) or Dayi conglomerate (3.6～1.7Ma) and represents a fining-upward retrogressive cyclothem in the foreland basin with alluvial fan sediments in the lower part and lacustrine sediments in the upper part. Sequence 5 is composed of the Middle Pleistocene Ya′ an conglomerate (0.65～0.20Ma) and represents a fining-upward retrogressive cyclothem in the foreland basin. Based on the filling succession and discordant contacts between Cenozoic strata in the basin, six tectonic events along the eastern margin of the Qinghai-Tibet plateau are recognized. During each tectonic event, thrusting was followed by strike-slip deformation, which controlled basin formation, sedimentation and tectonic seqe n c e .During the second and third tectonic events related to the Late Eocene collision between the Indian and Eurasian plates, deposition occurred within small intermontane basins. A hot, dry climate gave rise to sediments dominated by red beds interbedded with gypsum and eolian

sandstone. The fourth tectonic event in Early Miocene time resulted in deposition within a foreland basin. A warm, humid climate gave rise to the deposition of lignite-bearing microclastic rocks, which was subsequently uplifted to an elevation of 2000m. The fifth began in Pliocene time, during which a large volume of fan conglomerate was deposited in the foreland basin. The sixth tectonic event in Middle Pleistocene time resulted in deposition of conglomerate in the Chengdu foreland basin.
Key words:tectonic sequence; Cenozoic; tectonic events; Longmenshan-Jinpingshan; eastern margin of the Qinghai-Tibetan plateau