[1]虎亚伟,庞奖励,黄春长,等.汉江上游郧西段全新世古洪水水文学研究[J].自然灾害学报,2012,05:55-62.

HU Yawei,PANG Jiangli,HUANG Chunchang,et al.Hydrological study on holocene palaeoflood at Yunxi section of upper reaches of Hanjiang River[J].,2012,05:55-62.





# 汉江上游郧西段全新世古洪水水文学研究(PDF)

《自然灾害学报》[ISSN:/CN:23-1324/X] 期数: 2012年05期 页码: 55-62 栏目: 出版日期: 2012-10-31

Title: Hydrological study on holocene palaeoflood at Yunxi section of upper reaches of Hanjiang River

作者: 虎亚伟[1; 2]; 庞奖励[1]; 黄春长[1]; 查小春[1]; 周亚利[1]; 乔晶[1]

1. 陕西师范大学 旅游与环境学院, 陕西 西安 710062;

2. 甘肃省岷县第四中学, 甘肃 岷县 748400

Author(s): HU Yawei[1; 2]; PANG Jiangli[1]; HUANG Chunchang[1]; ZHA Xiaochun[1]; ZHOU Yali[1]; QIAO Jing[1]

1. College of Tourism and Environmental Sciences, Shaanxi Normal University, Xi'an 710062, China;

2. Minxian No.4 Middle School, Minxian, 748400, China

关键词: 滞流沉积物; 古洪水; 汉江; 全新世

Keywords: slackwater deposits; palaeoflood; Hanjiang River; Holocene

分类号: P331;P534.632

DOI: -

文献标识码: -

摘要: 通过对汉江上游的考察,在郧西段归仙河口(GXHK)发现了典型的全新世古洪水滞流沉积剖面。采集滞流沉积层样品,进行粒度、磁化率等分析,证明研究地点具有典型的古洪水滞流沉积层。通过地层学对比分析,确定两次古洪水事件分别发生在3 000- 2 700 aB.P.和公元100-200 年(即1 850-1 750 aB.P.)。利用沉积学、水文学方法计算出GXHK的古洪水流量介于63 090~64 320 $m^3/s$之间。用2010年、2011 年大洪水洪痕的现代水文学验证和美国学者Baker提出的河流流域面积与大洪水洪峰流量关系进行对比分析,证明古洪水水文学计算结果合理可靠,从而为汉江上游的工程建设及沿岸地区的防洪减灾提供参考。

Abstract: Through field investigation in the upper reaches of the Hanjiang River, palaeoflood slackwater deposit was found in the GXHK reach of Yunxi county. With the evidences from the collected samples of the slackwater deposits and the analysis of the grain size distribution, the magnetic susceptibility and so on, it can be seen that the slackwater deposits present typical palaeoflood study area. By pedo-stratigraphical contrast analysis, it is confirmed that the two palaeoflood events be dated back to 3 000-2 700 a B.P. and 1 850-1 750 a B.P. respectively. By using the sedimentological and hydrological methods, the

palaeoflood peak discharge was calculated at 63 090-64 320 $m^3/s$ in the GXHK reach. With the modern hydrology of deluge floodmark in 2010, 2011 and the relationship between drainage area and peak discharge proposed by American scholar V.R.Baker, contrast analyses were carried out, which shows that, the calculation results were reasonable and reliable. The method can provide a reference to engineering construction, flood control and disaster reduction in the upper reaches of the Hanjiang River.

参考文献/REFERENCES

[1] 谢悦波, 姜红涛. 古洪水研究: 挖掘河流大洪水的编年史[J]. 南京大学学报:自然科学版, 2001, 37(3): 390-395. XIE Yuebo, JIANG Hongtao. Palaeoflood study: excavating great flood history on rivers[J]. Journal of Nanjing University:Natural Sciences, 2001, 37(3): 390-395.(in Chinese)

[2] Sridhar A. A mid-late Holocene flood record from the alluvial reach of the Mahi River, Western India[J]. Catena, 2007, 70: 330-339.

[3] Baker V R. Palaeoflood hydrology in a global context[J]. Catena, 2006, 66(1/2):161-168.

[4] 谢悦波, 费宇红, 沈起鹏. 古洪水平流沉积与水位[J]. 地球学报, 2001, 22(4): 320-323. XIE Yuebo, FEI Yuhong, SHEN Qipeng. Slack water deposits and flow peak level of a paleoflood[J]. Acta Geoscientia Sinica, 2001, 22(4): 320-323.(in Chinese)

[5] Thorndycraft V R, Benito G, Rico M,et al. A long-term flood discharge record derived from slackwater flood deposits of the Llobregat River, NE Spain[J]. Journal of Hydrology, 2005, 313(12): 16-31.

[6] Baker V R. Desert paleoflood in central Australia[J]. Nature,1983,301(5900): 502-504.

[7] Baker V R. Magnitude and frequency of paleofloods[C]//Beven K,Carling P. Floods,hydrology,sedimentlogical and geomorphologic implications[J]. Wiley, Chichester, 1989: 171-183.

[8] YANG Dayuan, GE yu, XIE Yuebo, et al. Sedimentary records of large Holocene floods from the middle reaches of the Yellow River, China[J]. Geomorphology, 2000, 33: 73-88.

[9] 詹道江, 谢悦波. 古洪水研究[M]. 北京: 中国水利水电出版社, 2001:1-83. ZHAN Daojiang, XIE Yuebo. Palaeoflood Study [M]. Beijing: China WaterPower Press, 2001: 1-83.(in Chinese)

[10] HUANG Chunchang, JIA Yaofeng, PANG Jiangli,et al. Holocene colluviation and its implications for tracing human-inducesoil erosion and redeposition on the piedmont loess lands of the Qinling Mountains, northern China[J]. Geoderma, 2001, 36: 838-851.

[11] HUANG Chunchang, PANG Jiangli, ZHA Xiaochun, et al. Impact of monsoonal climatic change on Holocene overbank flooding along Sushui River, middle reach of the Yellow River, China[J]. Quaternary Science Reviews, 2007, 26(17-18): 2247-2264.

[12] 查小春, 黄春长, 庞奖励. 关中西部漆水河全新世特大洪水与环境演变[J]. 地理学报, 2007, 62(3): 292-300. ZHA Xiaochun, HUANG Chunchang, PANG Jiangli. Holocene extreme floods and environmental change of Qishuihe River in western Guanzhong Basin[J]. Acta Geographica Sinica, 2007, 62(3): 291-300.(in Chinese)

[13] 姚平, 黄春长, 庞奖励, 等. 北洛河中游黄陵洛川段全新世古洪水研究[J]. 地理学报, 2008, 63(11): 1198-1206. YAO Ping, HUANG Chunchang, PANG Jiangli,et al. Palaeoflood hydrological studies in the middle reaches of the Beiluohe River[J]. Acta Geographica Sinica, 2008, 63(11): 1198-1206.(in Chinese)

[14] 李晓刚, 黄春长, 庞奖励, 等. 关中西部漳水河全新世古洪水平流沉积地层研究[J]. 地层学杂志, 2009, 33(2): 198-205. LI Xiaogang, HUANG Chunchang, PANG Jiangli,et al. Sedimentary characteristics of the slackwater deposits of Holocene extreme floods in the Weishui River Valley in the western Guanzhong Basin[J]. Journal of Stratigraphy, 2009, 33(2): 198-205.(in Chinese)

[15] 李瑜琴, 黄春长, 查小春, 等. 泾河中游龙山文化晚期特大洪水水文学研究[J]. 地理学报, 2009, 64(5): 541-552. LI Yuqin, HUANG Chunchang, ZHA Xiaochun,et al. Paleoflood occurrencen in the late period of the Longshan Culture in the middle reaches of the Jinghe River[J]. Acta Geographica Sinca, 2009, 64(5): 541-552.(in Chinese)

[16] Zha Xiaochun, Huang Chunchang, Pang Jiangli. Palaeofloods recorded by salckwater deposits on the Qishuihe River in the middle reaches of the Yellow River[J]. Journal of Chinese Geography, 2009, 19(6): 681-690.

[17] Huang Chunchang, Pang Jiangli, Zha Xiaochun,et al. Extraordinary floods of 4100-4000 a BP recorded at the LateNeolithic ruins in the Jinghe River gorges, middle reach of the Yellow River, China[J]. Palaeogeography, Palaeoclimatology, Palaeoecology, 2010, 289(3): 1-9.

[18] 万红莲, 黄春长, 庞奖励, 等. 渭河宝鸡峡全新世特大洪水水文学研究[J]. 第四纪研究, 2010, 30(2): 430-440. WAN Honglian, HUANG Chunchang, PANG Jiangli,et al. Holocene extreme floods of the Baoji Gorges of the Weihe River[J]. Quaternary Science, 2010, 30(2): 430-440.(in Chinese)

[19] 万红莲, 黄春长, 查小春, 等. 渭河宝鸡峡全新世古洪水事件研究[J]. 陕西师范大学学报:自然科学版, 2010, 38(2): 77-80.

WAN Honglian, HUANG Chunchang, ZHA Xiaochuni,et al. Palaeoflood events in the Baojixia Gorges of the Weihe River [J]. Journal of Shaanxi Normal University:Natural Science Edition, 2010, 38(2): 77-80.(in Chinese)
[20] 朱向锋, 黄春长, 庞奖励, 等. 渭河天水峡谷全新世特大洪水水文学研究[J]. 地理科学进展, 2010, 29(7): 840-846. ZHU Xiangfeng, HUANG Chunchang, PANG Jiangli, et al. Palaeo-hydrologrcal studies of the Holocene extreme floods in the Tianshui gorges of the Weihe River[J]. Progress in Geography, 2010, 29(7): 840-846.(in Chinese)
[21] 葛本伟, 黄春长, 周亚利, 等. 龙山文化末期泾河特大洪水事件光释光测年研究[J]. 第四纪研究, 2010, 30(2): 422-429. GE Benwei, HUANG Chunchang, ZHOU Yali, et al. OSL dating of the Jinghe River palaeoflood events in the late period of the Longshan Culture[J]. Quaternary Science, 2010, 30(2): 422-429.(in Chinese)
[22] 李晓刚, 黄春长, 庞奖励, 等. 黄河壶口段全新世古洪水事件及其水文学研究[J]. 地理学报, 2010,65(11): 1371-1380. LI Xiaogang, HUANG Chunchang,PANG Jiangli, et al. Hydrological studies of the holocene palaeoflood in the Hukou Reach of the Yellow River[J]. Acta Geographica Sinica, 2010,65(11): 1371-1380.(in Chinese)
[23] Huang Chunchang, Pang JiangLi, Zha Xiachun, et al. Extraordinary floods related to the climatic event at 4200 a BP on the Qishuihe River, middle reaches of the Yellow River, China[J]. Quaternary Science Reviews, 2011, 30: 460-468.
[24] 李文浩. 汉江上游流域水文特性分析[J]. 水资源与水工程学报,2004,15(2): 54-58. LI Wenhao. Hydrologic characteristics analysis in the upper reaches of Hanjiang River[J]. Journal of Water Resources and Water Engineering, 2004,15(2): 54-58.(in Chinese)
[25] 殷淑燕, 王海燕, 王德丽, 等. 陕南汉江上游历史洪水灾害与气候变化[J]. 干旱区研究, 2010, 27(04):523-528. YIN Shuyan, WANG Haiyan, WANG Deli, et al. Study on Historical flood disasters and climate change in the Upper Reaches of the Hanjiang River[J]. Arid Zone Research, 2010, 27(4):523-528.(in Chinese)
[26] 李幼木. 汉江安康流域洪水规律分析及水库对安康城区的防洪作用[J]. 陕西电力, 2007, 35(10): 37-40. LI Youmu. Analysis on flood law in Ankang Basin of Hanjiang River & the effect of reservoir upon flood prevention in Ankang Urban Area[J] Shaanxi Electric Power, 2007, 35(10): 37-40.(in Chinese)
[27] 李燕,黄春长,殷淑燕,仇立慧.古代黄河中游的环境变化和灾害[J].自然灾害学报,2007, 16(6): 8-14. LI Yan,HUANG Chunchang,YIN Shuyan, et al. Environmental change and disasters in middle reaches of the Yellow River in history:influence on migration and development of capital[J]. Journal of Natural Disasters, 2007, 16(6): 8-14.(in Chinese)
[28] 刘东生. 黄土与环境[M]. 北京: 科学出版社, 1985: 62-81. LIU Dongsheng. Loess and Environment[M]. Beijing: Science Press, 1985: 62-81.(in Chinese)
[29] 鹿化煜, 安芷生, 刘洪滨, 等.洛川黄土记录的最近2500 Ka东亚冬夏季风变化周期[J]. 地质评论, 1998, 44(5): 553-558. LU Huayu, AN Zhisheng,LIU Hongbin, et al. Periodicity of east asian winter and summer monsoon variation during the past 2500 Ka recorded by loess deposits at Luochuan on the central Chinese loess plateau[J] Geological Review, 1998, 44(5): 553-558.(in Chinese)
[30] 鹿化煜, 安芷生. 洛川黄土粒度组成的古气候意义[J]. 科学通报,1997, 42(1): 66-69. LU Huayu,AN Zhisheng. Paleoclimatic significance of grain-size composition at Luochuan on the central Chinese loess plateau[J].Chinese Science Bulletin, 1997, 42(1): 66-69.(in Chinese)
[31] 谢悦波, 王文辉, 王平. 古洪水平流沉积粒度特征[J]. 水文, 2000, 20(4): 18-20. XIE Yuebo, WANG Wenhui, WANG Ping. Characteristics of grain size for palaeoflood slackwater deposits[J]. Journal of China Hydrology, 2000, 20(4): 18-20.(in Chinese)
[32] An Zhisheng, Kukla G J, Porter S C. Magnetic susceptibility evidence of monsoon variation on the Loess Plateau of central China during the last 130,000 years[J]. Quaternary Research, 1991, 36(1): 29-36.
[33] 刘秀铭, 刘东生, Heller F, 等. 中国黄土磁化率与第四纪古气候研究[J]. 地质科学, 1992, 12(增刊): 279-285. LIU Xiuming, LIU Tungsheng, Shaw F, et al. Study on Magnetic Susceptibility of Loess and Quternary Climate in China[J]. Chinese Journal of Geology, 1992, 12(s): 279-285.(in Chinese)
[34] 刘秀铭, 刘东生, Shaw J, 等. 中国黄土磁性矿物特征及其古气候意义[J]. 第四纪研究, 1993, 13(3): 281-287. LIU Xiuming, LIU Tungsheng, Shaw J, et al. Magnetic mineral characteristics of Chinese loess and its palaeoclimatic significance[J]. Quaternary Sciences, 1993, 13(3): 281-287.(in Chinese)
[35] 邓成龙, 刘青松, 潘永信, 等. 中国黄土环境磁学[J]. 第四纪研究, 2007, 27(2): 193-209. DENG Chenglong, LIU Qingsong, PAN Yongxin, et al. Environmental magnetism of Chinese loess paleosol sequences[J]. Quaternary Sciences,2007, 27(2): 193-209.(in Chinese)

备注/Memo: 收稿日期:2011-11-6;改回日期:2012-2-3。
作者简介:虎亚伟(1980-),男,藏族,硕士研究生,主要从事第四纪地质研究.E-mail:huyw_614@163.com
通讯作者:庞奖励,教授,博士.E-mail:jlpang@snnu.edu.cn