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Determining the Relative Age of Fault Activity through Analyses of Gouge Mineralogy and Geochemistry: A Case Study from Vápenná (Rychleby Mts), Czech Republic

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ABSTRACT

The relative age of fractures can be determined through structural analyses in the field or through the detailed mineralogical (XRD) and chemical analyses (AAS method, volumetric, and gravimetric analysis) of fault gouge in the laboratory. The aim of this work was to compare these approaches. It was hypothesised that the two methods would yield consistent results. The studied faults were located in the Rychleby Mts, part of the Sudetic Marginal Fault Zone. The relative age of the faults was determined in the field through the application of the intersection law. The fault gouges were sampled in a crystalline limestone quarry near the village of Vápenná. The mineralogical composition of the fault gouges has been established by XRD analysis of powder samples and analysis of preferentially oriented clay minerals. From our result, it is clear that these two approaches yielded consistent results with regard to the relative age of the faults.

KEYWORDS

Crystalline Limestone, Intersecting Faults, Fault Gouge, Relative Chronology

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References

[1] P. L. Hancock, "Brittle Microtectonics: Principles and Practise," Journal of Structural Geology, Vol. 12, No. 7, 1985, pp. 437-457.

[2] G. H. Groshong, "3-D Structural Geology A Practical Guide to Quantitative Surface and Subsurface Map Inter-pretation," 2nd Edition, Springer, The Netherlands, 2006.

[3] G. Y. Jeong and C. S. Cheong, "Recurrent Events on a Quaternary Fault Recorded in the Mineralogy and Mi-cromorphology of a Weathering Profile, Yangsan Fault System, Korea," Quaternary Research, Vol. 64, No. 2, 2005, pp. 221-233.

[4] G. H. Davis and S. J. Reynolds, "Structural Geology of Rocks and Regions," John Wiley and Sons, New York, 1996.

[5] H. Zwingmann and N. Mancktelow, "Timing of Alpine Fault Gouges," Earth and Planetary Science Letters, Vol. 223, No. 3-4, 2004, pp. 415-425.

[6] P. Hájek and M. ??astny, "Mineralogy of the Clay Gouge on Prague Fault," Acta Geodynamica et Geomaterialia, Vol. 4, No. 3(147), 2007, pp. 33-37.

[7] M. J. Ikari, D. M. Saffer and C. Marone, "Frictional and Hydrologic Properties of Clay-Rich Fault Gouge," Journal of Geophysical Research - Solid Earth, Vol. 114, No. B05409, 2009.

[8] R. Offler, D. J. Och, D. Phelan and H. Zwingmann, "Mineralogy of Gouge in North-Northeast-Striking Faults, Sydney Region, New South Wales," Australian Journal of Earth Sciences, Vol. 56, No. 7,

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2009, pp. 889-905.

[9] M. Opletal and V. Pecina, “The Ramzová Tectonic Zone: The Contact between Lugicum and Silesicum,” Acta Geodynamica et Geomaterialia, Vol. 1, No. 3(135), 2004, pp. 41-47.

[10] J. Badura, W. Zuchiewicz and B. Przybylski, “The Sudetic Marginal fault, SW Poland: A Reactivated Sinis-tral-Normal Fault,” Geolines, Vol. 17, No. 1, 2004, pp. 17-18.

[11] J. Skácel, “The Sudetic Marginal Fault between Bílá Voda and Lipová Lázně,” Acta Geodynamica et Geomaterialia, Vol. 1, No. 3(135), 2004, pp. 31-33.

[12] L. Nováková, “Main Directions of the Fractures in the Limestone and Granite Quarries along the Sudetic Mar-ginal fault near Vápenná village, NE Bohemian Massif, Czech Republic,” Acta Geodynamica et Geomaterialia, Vol. 5, No. 1(149), 2008, pp. 49-55.

[13] P. ?těpan?íková, J. Stemberk, V. Vilímek and B. Ko??ák, “Neotectonic Development of Drainage Network in the East Sudeten Mountains and Monitoring of Recent Fault Displacements (Czech Republic),” Special Issue on: Im-pact of Active Tectonics and Uplift on Fluvial Landscapes and Rift Halley Development, Geomorphology, Vol. 102, No. 1, 2008, pp. 68-80.

[14] L. Nováková, “Detailed Brittle Tectonic Analysis of the Limestones in the Quarries near Vápenná Village,” Acta Geodynamica et Geomaterialia, Vol. 7, No. 2(158), 2010, pp. 1-8.

[15] T. Buday, D. ?urica, M. Opletal and J. ?ebesta, “Signifi-cance of the Bělsky and Klepá?ovsky Fault System and its Continuation to the Carpathian Mts,” Uhlí, Rudy, Ge-ologicky Pr?zkum (in Czech), Vol. 2, No. 9, 1995, pp. 275-281.

[16] L. Nováková, “Brittle Tectonic Investigations in the North-Eastern Part of the Bohemian Massif, Czech Re-public,” 71st EAGE Annual Conference and Exhibition in Amsterdam, June 2009.

[17] Z. Mísa? and J. Skácel, “Devonian of Upper Part of the Branná Group,” In: Pouba, et al., Eds., Legend to the Geological Map of ?SSR 1:200000 (in Czech), Nak-ladatelství ?S AV, 1978.

[18] J. Zimák and J. ?telcl, “Natural Radioactivity of the Rocks in the Cave Na Pomezí near Jeseník,”