

The new structural model of the Pavlov Hills (Western Carpathians, Czech Republic)

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The Pavlov Hills are situated in the NW margin of the outer units of the Carpathian Flysch belt. The Ernstbrunn Limestone is suitable for the study of the paleostress analysis and the mechanics of brittle deformation (Poul, Melichar 2003). It presents the top member of the Jurassic carbonate facies of the Ždánice Unit of the Tithonian age (Houša, Řehánek 1987). The structure of Pavlov Hills Klippen Belt is connected with thrusting of Carpathian accretionary wedge. Thrusts are subparallel to bedding and striking in NE–SW direction and slightly dipping to the SE. Thrust sheets are crosscut by set of steep faults striking mostly NW–SE. The thrusts and transversal faults divide the limestone beds into several separated blocks forming the Pavlov Hills.

Fault/slip data were collected at eight localities (Turoid quarry, Turoid cave, Damoklova cave, Svatý kopeček [St. Hill] – southern block, Svatý kopeček – central block, Svatý kopeček – northern block, Janičův vrch quarry and Stolová Hill). Every fault plane and striae were precisely described. Special attention was focused to fault planes with two or more striations and to its time relations.

Polyphase fault/slip data set was subjected to new stress inversion procedure using PASCAL program “Přímá inverze” (Hroza 2003). Numerically separated clusters were compared to macroscopically obtained fault-plane features to get natural groups of faults reactivated in one stress state. Up to seven stress states could be delimited (T0–T6, see figure). Very wide striae (up to several decimeters) is typical for the oldest faults. The younger striae are usually finely spaced. The faults reactivated in state T4 and/or later are characterized by elongated or smashed black manganese tree-like coatings.

Results of the fault-plane geometry and kinematic analysis were used for construction of new geological map (see figure) showing new tectonic model of the area.

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