Rodl-Kaplice fault system – southern part - Rodl fault

Structure ID: RDL
Fault Section IDs: RDL_01 to RDL_06
Related terms: zlom Rodl (in Czech); Rodl-Kaplice Fault System (En)
Editor: Ivan Prachař

General description

Rodl-Kaplice fault is one of the very significant "N-S" faults, which belongs to the fault system of the Kourim-Blanice-Rodl-Kaplice Large-scale Fault System. This ca. 250 km long, approximately NNE-SSW (and partly NNE-SSW) trending large-scale fault system extends from the Kouřim Furrow in the North, following the Blanice Furrow, crossing the basins of Třeboň and České Budějovice via Kaplice (CZ) and the valley of the Große Rodl to Gramastetten (A) and the basin of Eferding, where it is partly covered by Miocene sediments, but continues into the basin subsurface (see http://resource.geolba.ac.at/structure/182).

As Rodl fault s.s. is considered ca. 55 km long, approximately NNE-SSW trending fault system, which extends from Rybník (CZE), following the valley of the Große Rodl to Gramastetten and the basin of Eferding, where it is partly covered by Miocene sediments, but continues in the basin subsurface (see http://resource.geolba.ac.at/structure/185). Rodl fault system includes partly parallel trending shear zones and faults, as e.g. Haselgraben subfault system. This ca. 15 km long N-S trending subfault system extends from Hellmondsödt, following the Haselgraben valley to Linz. It is part of the Rodl-Kaplice fault system and includes ductile parallel trending shear zones with left-lateral kinematics active during the Late Variscian (see http://resource.geolba.ac.at/structure/184).

Fault structure and dip

The core of the fault is formed by mylonites to phyllonites. The mother rocks from which the mylonitic rocks originated are pearl gneisses, migmatites and Weinsberger-type granite (see IGLSEDER, 2013; WALLBRECHER ET AL., 1993). Depending on the direction and dip of the mylonite foliation, it can be concluded that the fault has a steep dip (about 80°) to NW. Mylonites have lineation in the direction of NE-SW (see WALLBRECHER ET AL., 1993).

Cross structures and Segmentation

On Raster geological map of Upper Austria 1 : 200 000 is not drawn any fault that would segmented Rodl fault. But Pfahl shear zone and Danube fault are terminated by the Rodl fault.

Scarp morphology

The course of the fault is particularly pronounced between Gramastetten (A) in the south and Unterstiftung (A) in the north, where the course of the fault coincides with the Große Rodl valley. Fig. 1 shows a group of converged topo-lineaments with azimuth 41° (NE-SW) in section RDL_01. Towards the northeast, it is possible to observe several parallel topo-lineaments following the course of the fault sections of the NE-SW direction. These sections are interconnected by sections of the fault, where the fault run in a direction rather NNE-SSW.

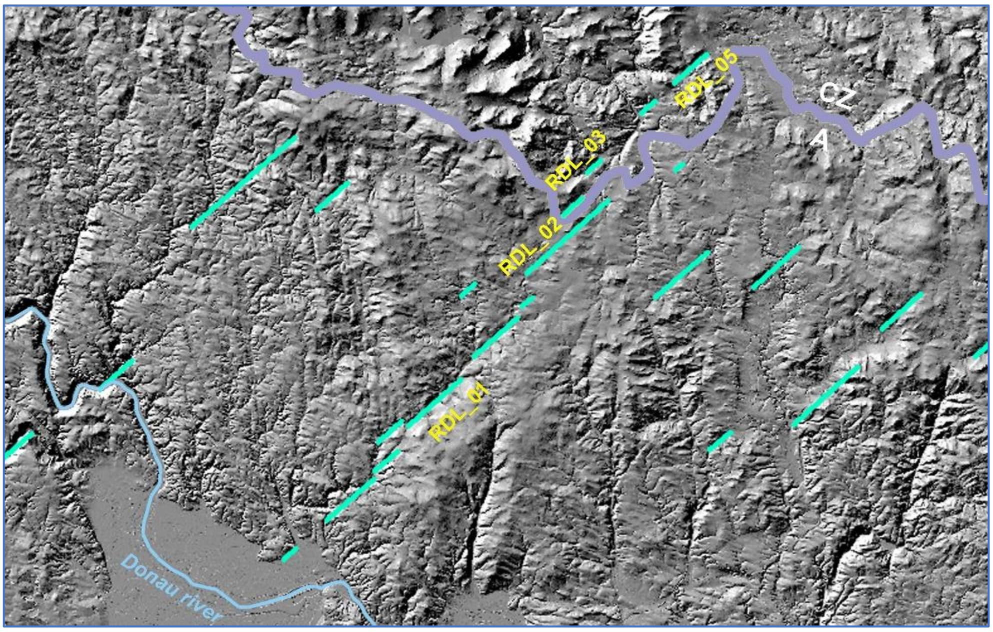

Fig. 1: Topo-lineaments related to the Rodl fault zone.

Seismicity

To be revised after completion of earthquake catalogue.

Pre-Miocene evolution

The beginning of shear zone formation is dated to the Early Paleozoic in connection with the formation of the Moldanubian nappes as a result of large-scale northeastward directed transpression of an Early Paleozoic terrane. After this main tectonic event, shear activity initiated on the dextral shear zone set of the Pfahl and Danube Shear Zones and in the sinistral Rodl, Karlstift and Vitis Shear Zones (see BRANDMAYR ET AL., 1997), as shown in Fig. 2.

However, the main ductile deformation phase is dated to the Late Variscian, showing mainly right-lateral movement (see http://resource.geolba.ac.at/structure/185).

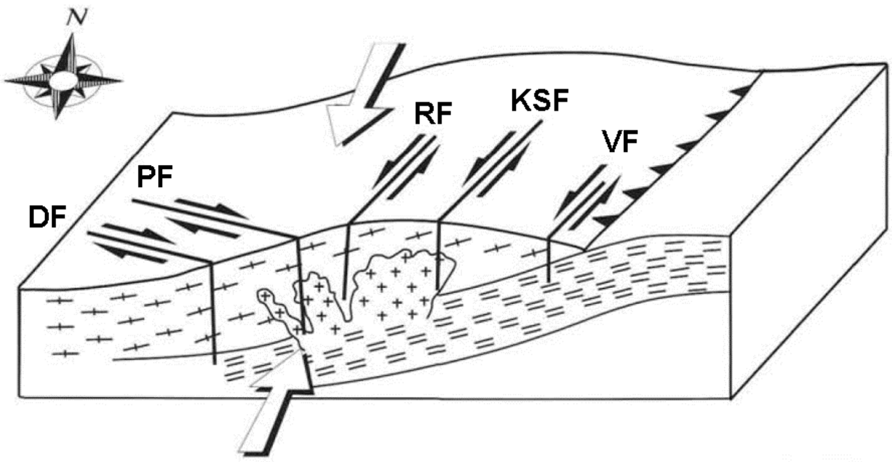

Fig. 2: Initial shear zone activity in the Danube (DF), Pfahl (PF), Rodl (RF), Karlstift (KSF) and Vitis (VF) Shear Zones. Arrows indicate major compression directions. Adopted from BRANDMAYR ET AL. (1997).

A long-lasting and multiphase deformation history can be assumed at the Rodl fault zone, among other during the Permian and Cretaceous Era. Proofs of NE-SW-trending left-lateral strike-slip ductile mylonitic shear zones during Upper Carboniferous and Permian times are observed (BRANDMAYR, ET AL., 1995; BÜTTNER, 2007, IGLSEDER, 2013).

Fault activity in late Cenozoic

According to IGLSEDER (2013) the deformation continuous with left-lateral strike-slip faulting during Cretaceous and Miocene times, indicated by sediment deposits. IGLSEDER (2013) suggests displacement up to 35 km (see also http://resource.geolba.ac.at/structure/183).

Post Miocene activity of Rodl zone faults has not been proven.

Related local evidence

They are not yet processed.

References

BRANDMAYR, M., LOIZENBAUER, J. & WALLBRECHER, E., 1997. Contrasting P-T conditions during conjugate shear zone development in the Southern Bohemian Massif, Austria.- Mitteilungen der Österreichischen Geologischen Gesellschaft 90, p. 11-29.

BÜTTNER, S.H., 2007. Late Variscan stress-field rotation initiating escape tectonics in the south-western Bohemian Massif: A far field response to late-orogenic extension.- In: Journal of Geosciences 52, Nr. 1-2, S. 29-43.

IGLSEDER, C., 2013. Bericht 2011-2012 über geologische Aufnahmen im Kristallin der Böhmischen Masse auf Blatt 4319 Linz. - Jahrbuch der Geologischen Bundesanstalt 153, 1-4, 434-438. [in German]

WALLBRECHER, E., BRANDMAYR, M., HANDLER, R., LOIZENBAUER, J., MADERBACHER F., PLATZER, R., 1993. Konjugierte Scherzonen in der südlichen Böhmischen Masse: Variszische und Alpidische kinematischen Entwicklungen. Mitt. Österr. Miner. Ges. 138 (1993), 237-252. [in German]

http://resource.geolba.ac.at/structure/182 (state to 2020-03-02).

http://resource.geolba.ac.at/structure/183 (state to 2020-03-02).

http://resource.geolba.ac.at/structure/184 (state to 2020-03-02).

http://resource.geolba.ac.at/structure/185 (state to 2020-03-02).