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## **Report on the thesis of Vladislav RAPPRICH**

### **Doupovské hory Volcanic complex**

The Thesis deals with the relatively little known volcanic complex in the Eger Graben and Bohemian Massif, Czech Republic. The work covers the general geology of the complex, the magma compositions and petrology, and the facies of lava and volcano-sedimentary units. The work is a solid and complete contribution to the knowledge of the volcanic complex and is of broad interest as it provides evidence of the nature of volcanism associated with the circum- alpine European Rifts active from the Eocene until the Miocene.

The thesis is associated with a number of solid publications that are already published, and underline the quality of the research. Papers submitted and in progress, indicate that the thesis is part of a solid developing research profile of the candidate.

I note that the ensemble of work presented here is broad ranged and shows a good variety of collaborations. Thus clearly, the candidate has shown the ability to work in a broad field and interact with specialists from fields other than his speciality. This is particularly seen in the chapters on Gamma-spectrometry (Skacelova et al 2009) and on the Palaeobotany (Skaka et al. ). At the same time there is some very sound detailed and closely focussed petrological and geochemical work (Rapprich 2005, and Rapprich and Holub, 2008), as well as some promising field and facies analysis of epiclastic rocks.

***As a general conclusion, I have no hesitation in recommending the thesis to be accepted for the title of Doctor of Philosophy of the Charles University. The thesis is suitable for the defence and its quality fulfils the criteria necessary for obtaining the PhD. At Charles University.***

### **Detailed Comments**

The following section represents additional comments on the layout and the content of the thesis, as well as some pointers to questions that might be discussed with the candidate.

1. I note that the unfinished chapter at the end of the thesis is particularly promising and, is very nearly in a complete enough form to be published. The unfinished FORMAT does not detract from its quality. My main comment for this and other chapters, it that while most of the illustrations are good and sound, there is a case to have more figures with outcrop details included. With field theses, it is worth having a supplementary section that shows as many outcrops as possible. In other chapters such as that concerning the Uhost Hill. (Rapprich and Holub, 2008), and the petrographic descriptions (Rapprich, 2005), the description of sections and thin-sections is well done.
2. The Cumulative nature of the Mg-rich rocks is very interesting, and has relevance to the greater European Cenozoic Volcanism. The Thesis is presented as a very focussed study of the Doupovské Hory, but a comparison with the other volcanic fields in structure, facies and petrography would be interesting. This is asking quite a lot and could be considered as a perspective for future work. On the other hand the place of Clinopyroxene crystallisation in magmatic rocks in general is well presented in the Rapprich 2005 paper.
3. The multiphase nature of the volcanism is an interesting aspect of the outcomes out of the work. This rings true also for the volcanoes of the Massif Centrale of France and for other intra-plate areas. Why should there be a multiphase evolution? - this is a question that has not really been tackled yet.
4. The timespan of the Activity (14 Ma) is similar to, or longer than the Massif Centrale Volcanoes. This is very long for any volcanic system, especially compared with arc volcanoes. And the question is? Why should volcanism occur over such a long time scale? Can a plume, or baby plume feed one location for so long? Or should some drifting of the activity be seen? If the volcanism is associated with the rift (an not a plume) could this be stable over such a long time.
5. I think the association of the Flurbühl Intrusion and the eruptives is an interesting question: are there clear links? With such a long history, can this be regarded as a magma chamber for the whole complex, or are other sources, zones of accumulation supposed. How could 14 MA of volcanism be fed? By discrete dykes?

## Conclusion

The thesis presented by Valdislav Rapprich is of sound quality, board-ranging, but with strong focussing on the petrological, geochemical and facies analysis of the Doupovské hory Volcanic Complex. The range of subjects treated in serious detail and the number of publications is noteworthy. The thesis candidate is absolutely worthy of defending the title PhD. for this work.



**Benjamin van Wyk de Vries**

**Clermont-Ferrand 02/11/2009**