



Do the post-Miocene volcanic features really mark a single paleoaltitude in the Transdanubian Range (Pannonian basin)?

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The post-Miocene volcanic features of Bakony – Balaton Highland Volcanic Field in the Transdanubian Range north of the Lake Balaton are remarkable landforms in the Pannonian basin. This is true not only because of their aesthetic beauty decorating the landscape seen from the lake, but they were always attributed to carry very special geological information.

Based on the fact that the basaltic lavas are on top of the Pannonian strata and in the vicinity of the Badacsony, a remarkable volcanic edifice remnant reaching 437 m elevation a.s.l., there is a number of other smaller volcanic edifices similar in height. The basic assumption has long been maintained that the bottom of the volcanic material marks the paleoaltitude of the contemporaneous surface elevations. Accordingly, the surrounding area, now more than 300 m lower than the top of the hill, should have been filled up with (primarily Pannonian) sediments that have been eroded away since then.

There are some contradicting observations that make this model not completely verifiable. First of all the volume of the material that had to be evacuated is considerable. Of course, not all the volcanic edifices are coeval, and this way one can argue, that the erosion could start working on the older structures, while the younger one were only in their phase of formation. Furthermore, in the vicinity, just on the opposite side of

the Lake Balaton there was a smaller basaltic hill, the material of which has been extensively used for construction in the area during the last century. Even if we consider a larger drop in the elevation due to the exploitation, the original elevation was not comparable to that of the Badacsony.

Another volcanic edifice of Tihany (also an attractive touristic area with breathtaking landscape full with objects of cultural heritage) is remarkably lower than those of its counterparts around Badacsony. It has been proven that Tihany volcano is remarkably older (some 8 Ma old) and, based on xenolith studies, the volcanic material has crossed a mantle that had a different composition than its other counterparts.

More to the NE, decreasingly smaller volcanic edifices can be found (Ság Hill and Somló Hill) and some other minor volcanic forms.

This spatial pattern, i.e. the elevations are decreasing on both sides of Transdanubian Range suggests that the vertical crustal movements may be responsible for the axis-perpendicular distribution of characteristic elevations of the volcanic material.

To test this theory we made a short calculation for the possible elevations using the data of the recent vertical crustal movements that were derived from repeated precise levelling.

A remarkable correlation can be found between the two datasets. These data may result later in a reconsideration of the concept. On the other hand, the various ages of the volcanic edifices should also be taken into account in a more detailed study. It should also be emphasized, that the recent crustal movements, that may also have considerable errors, cannot be extrapolated backwards in time.

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