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The Bontău Volcano, Apuseni Mts. (Romania), source for numerous debris avalanche deposits

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The Neogene volcanism in the western part of Romania is confined to the Apuseni Mountains and surrounding areas. The largest volcanic area is mostly developed in the WNW-ESE oriented, ca. 120 km in length Zărand-Brad-Zlatna Basin.

The Bontău Volcano (Seghedi et al., 2010) is located inside the western part of the Zărand-Brad-Zlatna Basin and it is strongly affected by erosional processes, being crossed in its northern part, from east to west, by the Crișul Alb River.

The Bontău Volcano is known to be active roughly between 14-10 Ma (according to the available K/Ar data) and it has been characterized as a composite or stratovolcano volcano associated with dome complexes, built by calc-alkaline andesitic lavas and pyroclastic deposits (andesite to basaltic andesite). The long-lasting volcanism developed in the Bontău area has a complex build up stages that we recently have found were interrupted by a series of destructive failure events. Several important volcanic collapses of the volcanic edifice took place producing large volcanic debris avalanches followed by numerous debris flows which produced various secondary volcanoclastic deposits that can be observed in different places all around the Bontău volcano. The debris avalanches deposits have not yet been known up to this study. The distribution of the debris avalanche deposits and associated volcanoclastic deposits is the main target of this study. In order to reconstruct Bontău Volcano activity and reconstruct its original morphology we done field observations and sampled the main lithologies to perform petrographic observations and geochemical and isotopic analyses (for the main lithologies).

During our field observations we tried to identify the relationships between debris avalanche deposits and older volcanic bodies (lavas, domes, volcanoclastic). One main important remark is related with the presence of several small basins at the margin of the volcano consisting of a succession of thin planar and cross-bedded sandstone in an alternation of coarse and fine layers associated with discontinuous lapilli trains (including pumices); The deposits are poorly to moderately sorted; with low angle cross lamination in lenses or pockets. Such deposits, as closely associate with debris avalanche deposits have been interpreted as small intra-hummocky basins formed after debris avalanche generation; they are mostly situated at the margins of the volcano.

The presence of multiple debris avalanche deposits can be connected with volcano growing in an

extensional environment. We may assume that the long-lived Miocene rift graben system of the Zărand-Brad-Zlatna Basin experienced numerous changes in the fracture propagation and vertical movements that promoted repeated dyke intrusion and facilitated generation of numerous debris avalanches.

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