



## Tephrochronology and geochemical correlation of Middle Pleistocene distal tephra deposits in Armenia

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Widespread volcanism played significant role in geological history of Anatolian-Armenian-Iranian orogenic plateau formed as a result of continental collision of Arabian and Eurasia. Among diverse chemical compositions and eruption styles, reported for volcanoes of Armenian highlands, noteworthy are distal tephra fallout deposits and voluminous ignimbrite shields resulted from violent explosive volcanic eruptions with VEI estimations ranging from 4 to 6. Obviously, such eruptions had significant impact on climate, human occupation and migrations in the entire region and provide insights to volcanic hazards in the region. One difficulty in the identifying and studying explosive eruptions during Pleistocene, is that many tephra fallout deposits are not preserved in the geologic records, since unconsolidated deposits erode rapidly, particularly in mountain topography. In Armenia, there is a sparse geologic record of tephra fallouts, except where these deposits are preserved beneath pyroclastic flows, which presumably occurred very soon after tephra deposition. Such tephra deposits, are known in Armenia in underlying ignimbrite units related to activity of Aragats stratovolcano (Gevorgyan et al., 2018), beneath Ani ignimbrite in western part of Armenia and activity of Irind and Pemzashen volcanoes. Alternatively, tephra deposits can be preserved if layers are rapidly covered by loess deposits or colluvium deposits or landslides shortly after the eruption and tephra deposition occurs. Such conditions are known for distal tephra fall deposits from Ararat volcano in Ararat depression and in NE Armenia near Ijevan. A big number of finds of Paleolithic stone tools, and recent achievements in studying Paleolithic archeology in south Caucasus region provide evidences of early human occupation in the territory of south Caucasus. This contribution aims to fill gaps in our knowledge of distal tephra layers identified in Armenia, namely in north-east, south and central parts of Armenia. New data based on detailed geochemical investigations and <sup>40</sup>Ar/<sup>39</sup>Ar age determinations of distal tephra layers originated from violent explosive eruptions, reported in this study, can contribute to establish chronostratigraphic horizons as marker layers for paleoclimate and archaeological records during Middle-Upper Pleistocene in the entire region. Tephra layers preserved in Pleistocene sedimentary sequences in Armenia provide important information about these violent explosive eruptions that are significant for the geological evolution and the human geography of the entire region.