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K-Ar AGE OF THE RIOLITA TILZAPOTLA VOLCANIC ACTIVITY, GUERRERO STATE, MEXICO AND ITS STRATIGRAPHIC IMPLICATIONS

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Reconnaissance geological studies of central southeastern Mexico (Morelos, Mexico and Guerrero States) were reported by Fries (1960). The exposed rocks range in age from early Paleozoic to Recent. Here we shall restrict ourselves to the late Mesozoic-early Cenozoic portion of the stratigraphic column. Following the deposition of the Mesozoic marine sedimentary formation, the region emerged and was covered by continental sediments and basic volcanic rocks which formed a typical molasse deposit. This deposit, of variable lithology and thickness, is known as the Balsas Formation (Fries, 1960). The Formation overlies all older rocks with an angular unconformity and is unconformably overlain by rhyolitic volcanics of the Riolita Tilzapotla everywhere these volcanics are present or unconformably overlain by other volcanic units. No diagnostic fossils have been found, but based on local and regional correlations of some fossiliferous units, Fries (1960) considered the age range of the Formation as late Eocene to middle Oligocene. The upper limit was mainly based on a Pb- α date on zircons from the Riolita Tilzapotla of 26 m.y. (Jaffe et al., 1959). All igneous units overlying the Riolita Tilzapotla were consequently considered as post-Oligocene although no radiometric dates or paleontological evidences were available. Recent studies on the area of San Juan Tetelcingo in the Balsas basin (Ortega-Gutiérrez, 1980) indicate that the rocks previously included in the Balsas Formation may correspond to a volcanic unit (Tetelcingo Formation) of Late Cretaceous (Maestrichtian) age. This was supported by K-Ar dates on biotite and basalt samples which give 66 ± 2 and 68.8 ± 2 m.y., respectively (Ortega-Gutiérrez, 1980). On this basis, de Cserna et al. (1980) have extended the age range of the Balsas Formation, which was considered as Paleocene, to early Oligocene. The purpose of this work is to report a new K-Ar date for the Riolita Tilzapotla and briefly discuss its stratigraphic implications.

POTASSIUM-ARGON DATING

Samples were collected from a locality near Taxco village, Guerrero State, and portions of four small blocks separated a few meters apart in the field were selected for the radiometric study. Petrographic analyses indicated that the samples were rhyolitic tuffs with feldspars and rock fragments as megascopic components; under the microscope primary minerals were glass, quartz, oligoclase and magnetite. Secondary minerals were hematite, limonite and clay minerals. Experimental work was carried out in the Instituto de Geocronología y Geología Isotópica, and the techniques used are those described by Linares et al. (1973) and Linares and Valencio (1975); the K-Ar date obtained is 49 ± 3 m.y.

DISCUSSION

With the new K-Ar date for the volcanic activity of the Riolita Tilzapotla, the stratigraphic relationships can be modified. First, the age assigned to the Riolita Tilzapotla corresponds to the middle Eocene. Second, since these volcanic rocks conformably overlie rock units of the Balsas Formation, the age of the Formation is considered as younger than middle Eocene. The lower age limit of the Balsas Formation may correspond to the Paleocene (de Cserna et al., 1980), depending upon the stratigraphic relationships of the Tetelcingo volcanics and the Balsas deposits which remain to be studied in detail (Ortega-Gutiérrez, 1980). Also, the stratigraphic relationships of the younger rock units covering the Riolita Tilzapotla should be studied, and their ages may need to be modified.

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SAMPLE DESCRIPTION

1. *M48-51* K-Ar Rhyolitic tuff (road cut near Taxco village; $18^{\circ}33.4'N$, $99^{\circ}37.4'W$, Guerrero State, Mexico). Contains feldspars and rock fragments as megascopic components. Primary minerals are quartz, oligoclase, glass and magnetite; secondary minerals are hematite, limonite and clay minerals. *Analytical data:* $K_2O = 0.93\%$, radiogenic $Ar^{40} = 2.217 \cdot 10^{-10}$ mol/g, atmospheric $Ar^{40} = 18.2\%$. (whole rock) 49 ± 3 m.y.

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