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Volcanoes of Nigeria: a Preliminary Study

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Large volcanic provinces (Jos and Biu Plateaux) occupy the eastern half of Nigeria bordering the Cameroon Mountains, dotted with conspicuously visible number of dormant/extinct volcanoes with no reported cases of activity. The volcanoes in these provinces are aligned mainly in a general NNW-SSW direction and represent previous volcanic eruptions and are therefore potential future eruption sites. The volcanoes are in places represented by well preserved cones and lava flows and are built mainly by basaltic scorias and pyroclastics. In places the lava flows have been eroded leaving remnants of decomposed basalts and a number of plugs and dome-like outcrops lacking any preserved cones. The basalts display composition that is essentially the same consisting of phenocrysts of both olivine, plagioclase (bytownite-labradorite), and rarely pyroxene (diopside-augite) set in a groundmass of labradorite laths, magnetite, ilmenite, minor K-feldspars, and volcanic glass. Geochemical data shows that these basalts vary in composition from alkaline olivine basalts to calc-alkaline basalts. Preliminary Ar-Ar dating of five overlapping volcanic cones from one of the volcanic provinces revealed ages spanning from 2.5Ma, 1.97Ma, 1.66Ma, 1.39Ma and 1.34 Ma conforming to the Quaternary age (Pleistocene epoch) ascribed to these rocks from mineralogical studies. There have been reported cases of extinct/dormant volcanoes elsewhere that have roared back to life. The several incidences of volcanic eruptions along the nearby Cameroon volcanic line (in 1909, 1922, 1959 and 1982)

situated at the North-eastern extremity of Nigeria are pointers to an impending volcanic eruption in Nigeria. Infact, the visible effects of such eruptions are floodings along the river Benue and some of its major tributaries in the neighbouring Taraba, Adamawa and Benue States of Nigeria. A lot needs to be done to assess the risk level of each of these volcanoes for effective monitoring and land use planning as more people live and farm in these potentially endangered volcanic prone areas, unaware of the inherent risk.

Keywords: Volcanoes, Quaternary, basalts, monitoring, risk, volcanic eruption

References

- Beer, K. E. (1952): The Petrography of some of the Riebeckite – Granite of Nigeria. Rep.,geol. Surv.U.K., atom. Energy Div., no.116. London, H.M.S.O
- Grant, N. K., Rex, D. C. and Freeth, S. J. (1972): Potassium-

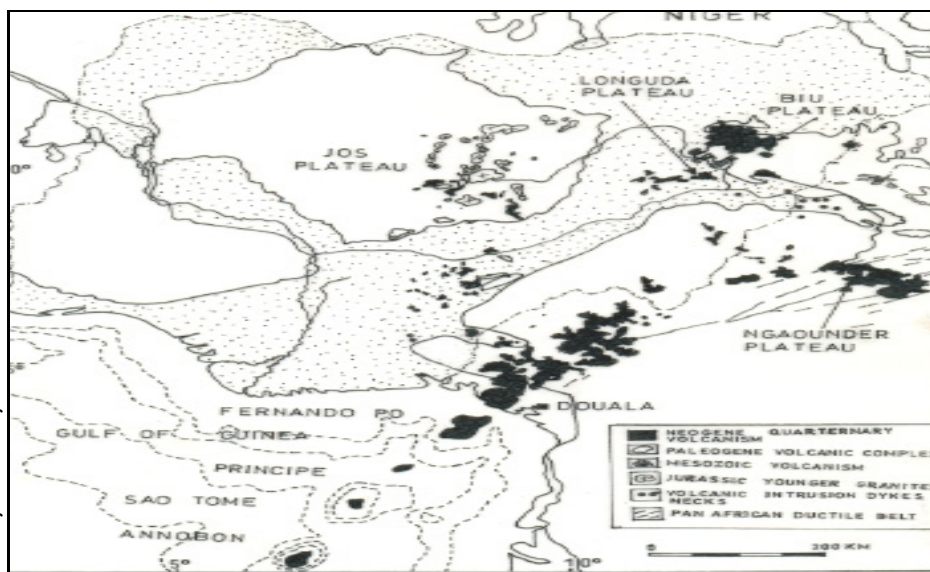


Fig. 1: Volcanic Provinces in Nigeria and the adjacent Cameroon and the Gulf of Guinea (Modified after MacLeod et al., 1971).

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Argon ages and Strontium Isotope ratio Measurements from

Table 1 Argon/Argon Dating of Basaltic Rocks from Kassa Volcanoes, Jos Plateau Province, Nigeria.

S/N	Sample Code/Coordinate	Altitude (m)	Age Dated (Million)	MSWD	(Sigma)	Remarks
1	CN 3 (Cone 3) N09 36.082 E853.648	1314	2.500 ± 0.318Ma	1.318	2 σ	A good spectrum
2	CN 5 (Cone 5) N0936.132 E853 398	1322	1.970 ± 0.173Ma	0.893	2 σ	Good Spectrum
3	CN 6 (Cone 6) N09 36 442 E853 195	1325	1.388 ± 0.538Ma	Too High (1.388)	2'σ	Good Spectrum
4	CN 7 (Cone 7) N09 36.073 E853.541	1347	1.661 ± 0.195Ma	Too High (1.661)	2'σ	Good Spectrum
5	CN 8 (Cone 8) N09 36.138 E853.570	1336	1.343 ± 0.080Ma	0.673	2 σ	Fairly Good Spectrum

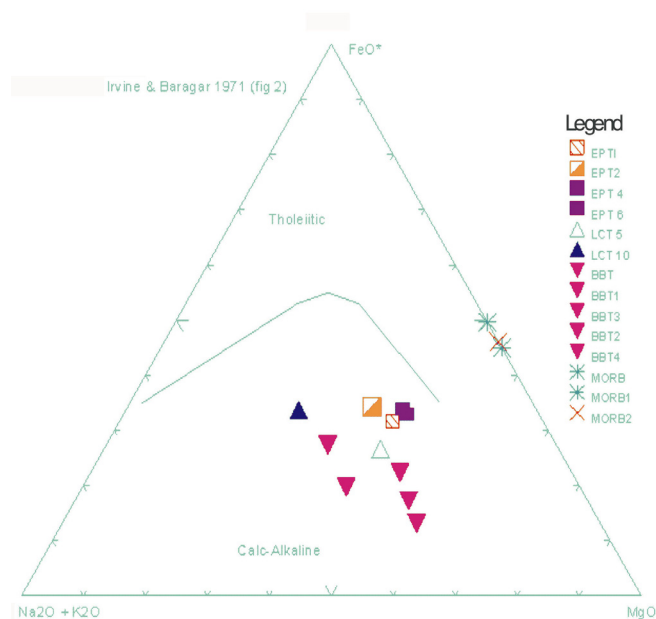


Fig. 2 AFM diagram depicting the Composition of basalts from the volcanic provinces in Nigeria in comparison to those of MORB

Volcanic rocks in Northern Nigeria. Contr. Mineral. Petrol. Vol. 35, pp277- 292.

Jacobson, R.R.E and Jaques, E. H. (1944): Report on Wolfram Investigations. Rep. geol. Surv. Nigeria, 1943.

Lar, U.A. and Tsalha, M.S. (2004): Geochemical Characteristics of the Jos Plateau Basalts, North Central Nigeria. Global Journal of Geological Sciences Vol.3 N02, pp 187-193.

Macleod, W.N., Turner. D.C and Wright, E.P. (1956): The

Geology of Jos – Bukuru Younger Granite Complex with reference to the Distribution of columbite, Geology Surv. of Nigeria. Vol.1 Bull. 32. Rec., pp17- 34.

Macleod, W.N, Turner, D.C and Wright, E.P. (1971): The Geology of the Jos Plateau. General Geology Bull. Geol. Surv. Nigeria 32. vol. 1.

Mackay, R.A., Greenwood, R and Rockingham, J.E. (1949) The Geology of the Plateau Tin fields Resurvey 1945-48. Geological Survey of Nigeria, Bull No.19.

Massonnet, D. and Feigl, K. L. (1998), "Radar Interferometry and its Application to changes in the Earth' s surface" , Rev. Geophys. 36 (4): 441–500).

Mc Curry. (1976): The Geology of Precambrian to lower Paleozoic rocks of Nigeria –a review Geology of Nigeria (2nd edition) C.A Kogbe (ed). Rock view Nigeria ltd, Jos.

Ogezi, A.E (1988). Origin and Evolution of the Basement Complex of Nigeria in the light of New Geochronological and Geochemical Data. In Precambrian Geology of Nigeria. Geological Survey of Nigeria publication. Pp 301-312.

Reburn, C (1924) : The Tinfields of Nassarawa and Ilorin Provinces. Bull. Geol. Surv. Nigeria, no. 5.

Tilling, Robert I., (1984): *Eruptions of Mount St. Helens: Past Present and Future*. Department of the Interior, U.S. Geological Survey, 46 pp.

Turner, D.C. (1976): Structures and Petrology of the Younger Granite Ring Complexes. Geology of Nigeria. 2nd Edition .

Unger, F.D. (1974): Techniques of Monitoring Kilauea Volcano Hawaii, USA <http://volcano.und.nodak.edu/vw.lessons/monitoring.html>.

Wright, J. B. (1969): Olivine nodules and Related Inclusions in Trachyte from the Jos Plateau, Nigeria. Mineralogical Mag. Vol 37, 287, pp 370-3