except at Gangapur (Upper Godavari Valley), Maharashtra, which relatively on geomorphological basis, is dated to Late Pleistocene[13]. Outside India the innumerable dates from various sites of Late Acheulian complexes, spread between North Germany and East Africa, range between 700,000 years BP and 125,000 years BP[14]. The associated hominid fossils with Late Acheulian complexes (outside India) have been morphologically assigned to archaic *Homo sapiens*[15]. It is proved beyond doubt that archaic *Homo sapiens* was geologically at par with *Homo erectus* since the late Middle Pleistocene[16] times.

On the basis of the archaeological investigations at fossil hominid site of Hathnora, and the close similarity of the associated tools with other Late Acheulian complexes in and outside India, the age assigned to the culture and the fossil skull cap is late Middle Pleistocene to early Late Pleistocene. However, it would be premature to comment on the phylogenetic position of the hominid at this stage. But the findings of archaic *Homo sapiens* in association with Late Acheulian complexes outside India, as argued earlier, necessitate a critical reinvestigation into the identification of *Homo erectus narmadiensis*.

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A NOTE ON THE PLAGIOGRANITE OCCURRENCE IN THE NAGA HILLS OPHIOLITE BELT, NE INDIA

P. VENKATARAMANA, S. BHATTACHARYYA and SIBDAS GHOSH
Geological Survey of India,
2, Church Street, Geocommercial Complex,
Bangalore 560001, India.

LATE-STAGE leucocratic rocks (albite granite, trondhjemite and quartz diotite) associated with ultramafic-mafic rocks in ophiolite complexes have been collectively called plagiogranite[1,2]. These differ significantly from their continental equivalents in their low K_2O, high normative albite and tholeiitic chemistry. In an AMF diagram they follow the Thingmuli trend[3]. Both primary[2,4] and hydrothermal[5,6] origins have been suggested for these rocks. Albite-quartz rocks have been recorded from Nagaland ophiolites[7,8]; however, not many details are published. In this paper the petrography and chemistry of these rocks are presented.

Geological Setting: The Naga Hills which form the northern part of the arcuate Indo-Burman Ranges, comprise thick sequence of shale, siltstone, mudstone, greywacke, minor limestone (Disang Formation) and infolded ophiolites (figure 1) of late Cretaceous-Eocene age[9]. The contact between the ophiolites and the enclosing sediments is sharp and marked by a high-angle reverse fault which, at places, have been offset by NW-SE and E-W faults. The various members of the ophiolite suite[10] occur as steep-dipping, fault bounded slices. The ophiolites are, at places, unconformably overlain by immature, ophiolite derived sediments (Phokphur Formation).

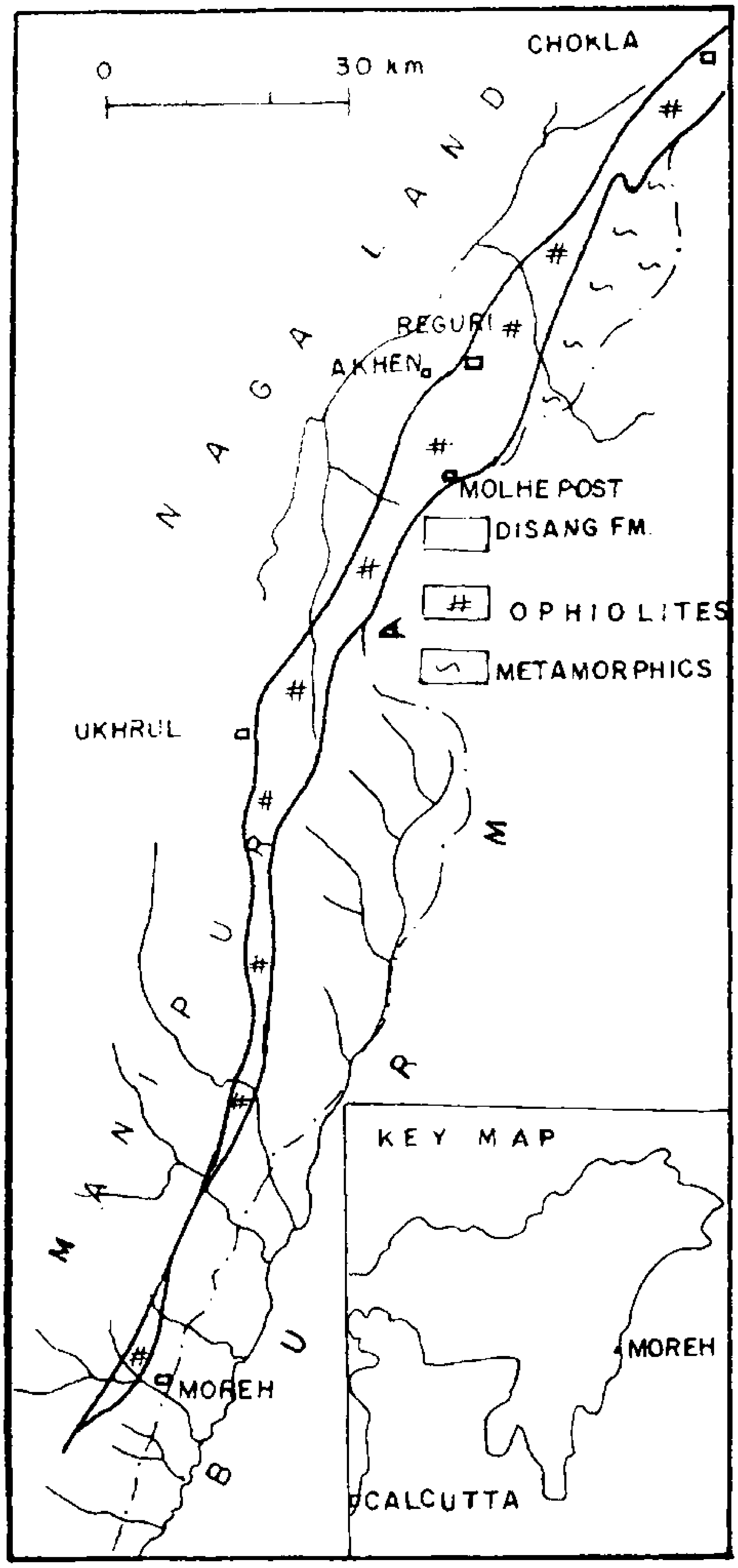

Figure 1. Generalised geological map of Naga Hills ophiolites.

Field relations and petrography: The plagiogranite veins and dykes, varying in width from 5 cm to 2 m, occur as intrusives within cummulate ultramafics, layered gabbros, basic volcanics and overlying sediments (Phokphur Formation). The trend of these veins and dykes coincides with the major joints and fractures in the area (NNE-SSW and E-W). The vein country rock boundry is sharp and at places, marked by hydrothermal alteration of the host rock which is characterised by saussuritization of feldspars and uralitization of pyroxenes in gabbros. The plagiogranites essentially comprise of quartz (42–69 %), albite (25–52 %), minor hornblende (4–8 %), and opaques (1–3 %) and are characterized by hypidiomorphic and granophyric textures.

Chemistry: The chemical composition of plagiogranites is given in table 1. The rocks have low K_2O (0.11–0.40 %), moderate to high SiO_2 (60.05–72.40 %), high Na_2O (1.45–8.25 %). These rocks are comparable to oceanic plagiogranites[3] in their low $K_2O \times 100/Na_2O + K_2O$ ratio (2.67–7.23) and high normative albite(31.20–70.80). In the semilog K_2O versus SiO_2 plot (figure 2), all the analyses fall in the filed of oceanic plagiogranites[3]. Similarly, in the AFM diagram (figure 3) these rocks like other ophiolitic plagiogranites[3], fall in the tholeiitc field and follow the Thingmuli trend.

Compared to the continental trondhjemites[11,12] these rocks have higher TiO_2 (0.22–0.82 %), FeO^t (1.91–6.68 %) and lower MgO (0.40–2.27 %). These chemical characteristics suggest that the plagiogranites are primary late-differentiates of a K-depleted tholeiitic melt[13].

Conclusions: The occurrence of plagiogranite as veins and dykes in cummulate ultramafics, basic

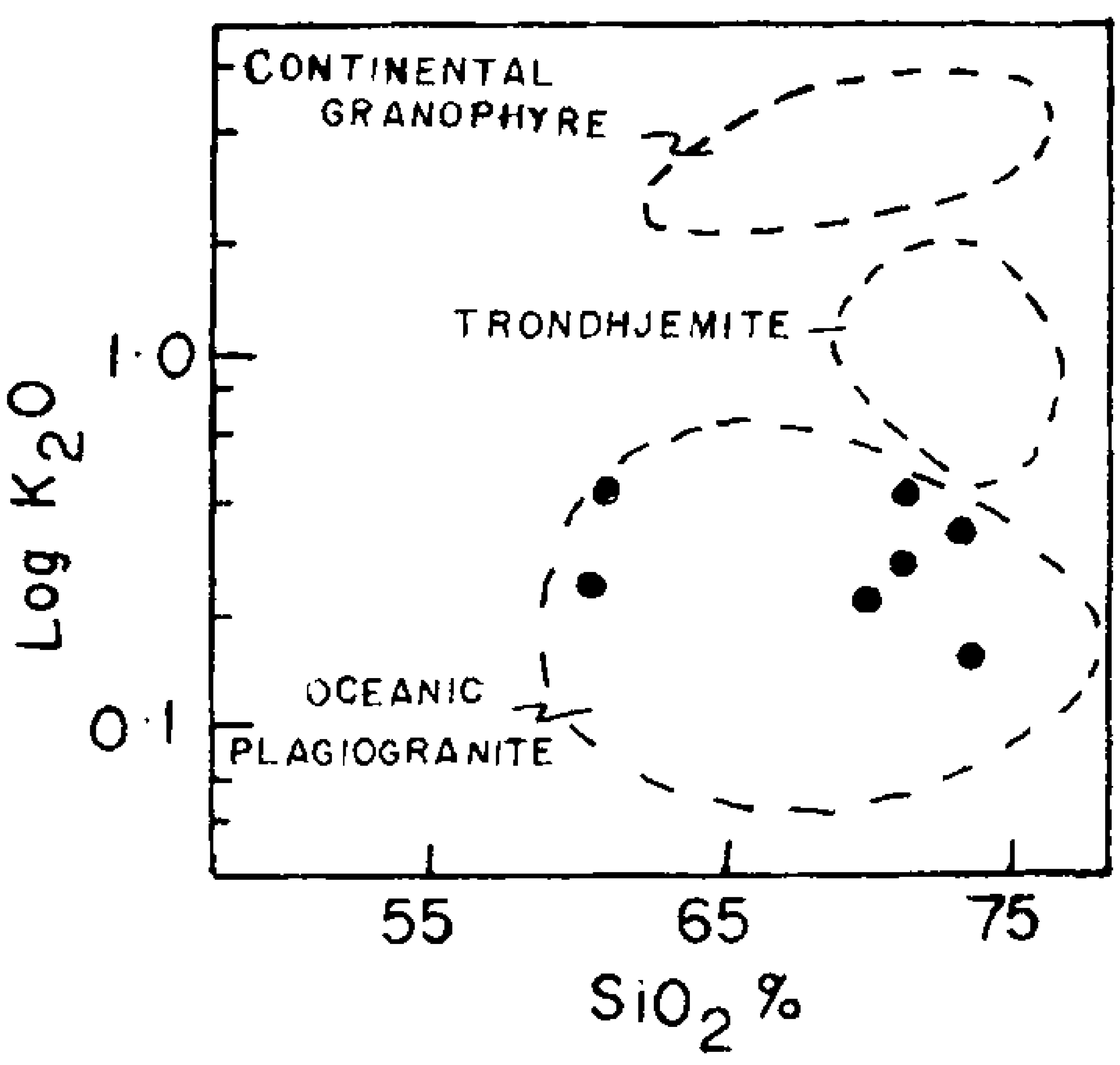

Figure 2. Log K_2O *vs* SiO_2 (wt %) plot for the plagiogranites from Naga hills.

Table 1 *Chemical composition of plagiogranites from Naga Hills*

	326/81	324A/81	311B/81	325/81	286/81	248/81	255/81
SiO_2	72.40	70.23	61.12	60.05	72.37	69.16	70.28
TiO_2	0.50	0.29	0.70	0.82	0.36	0.22	0.29
Al_2O_3	13.93	16.96	18.85	17.12	13.00	13.88	16.96
$Fe_2O_3^t$	5.60	1.91	3.57	6.68	4.24	5.32	1.91
MgO	1.61	0.40	1.08	2.27	0.50	1.50	0.40
CaO	2.24	1.12	4.55	3.52	2.10	2.80	1.12
Mno	–	0.02	–	–	–	–	0.02
Na_2O	1.45	7.74	8.25	6.70	4.49	3.65	7.74
K_2O	0.11	0.27	0.28	0.40	0.35	0.22	0.27
LOI	1.94	0.95	1.85	1.92	1.28	2.48	0.95
Total	99.78	99.89	100.25	99.48	98.69	99.23	99.94

LOI loss on ignition; $Fe_2O_3^t$ total iron as $Fe_2O_3^t$; 1 to 4 plagiogranite from Reguri; 5 and 6 plagiogranite from Akhen; 7 plagiogranite from Molhe post. All from Phek District, Nagaland.

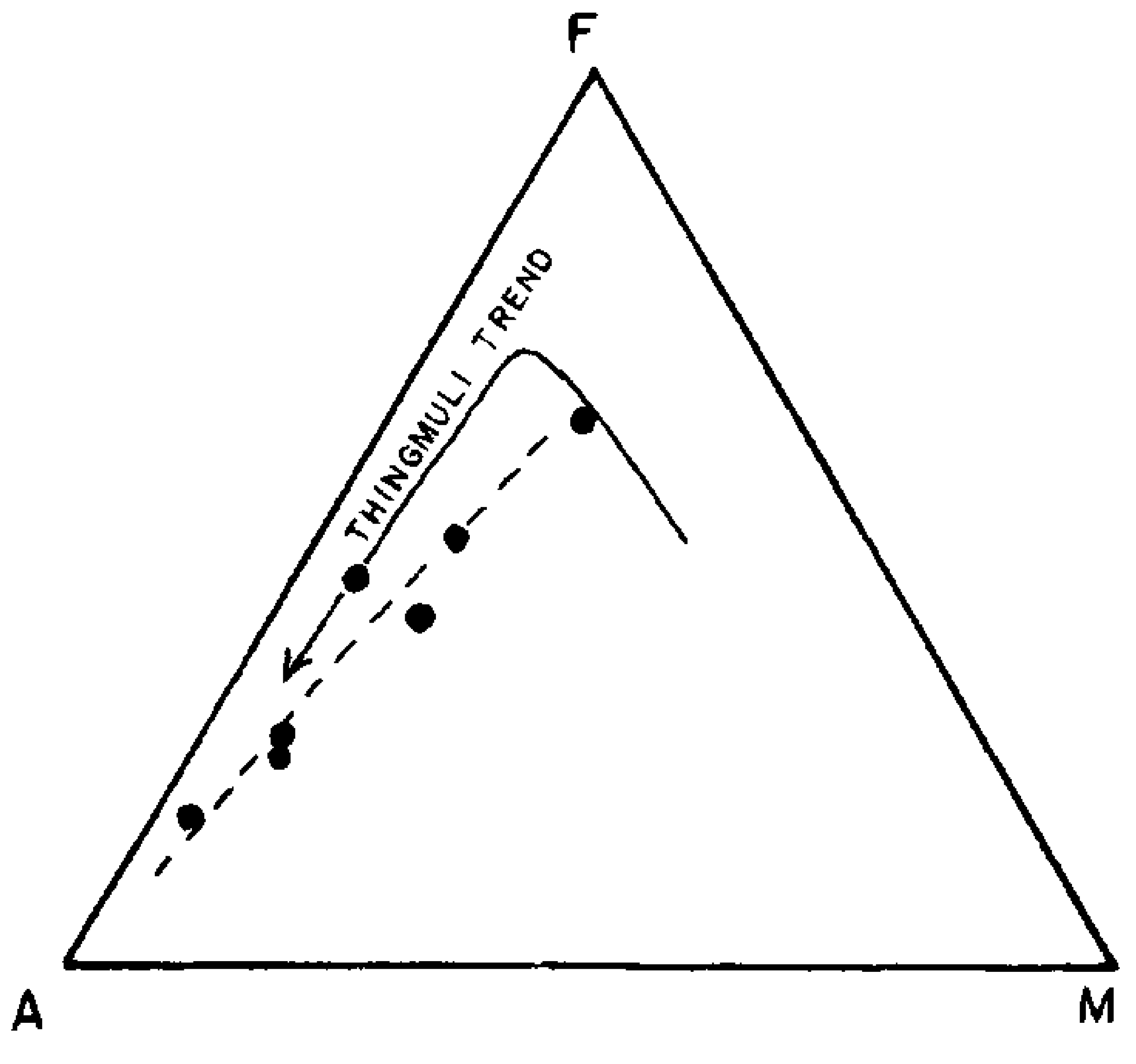

Figure 3. AFM $A = (Na_2O + K_2O)/F = FeO^t/M = MgO$ plot for the plagiogranites of Naga Hills.

volcanics, gabbros and cover sediments (Phokphur Formation) indicates that acid igneous activity in the area continued well after the emplacement of the ophiolites during upper Cretaceous-Eocene[8]. The chemistry of these rocks suggests that they are late-differentiates of a K-depleted tholeiitic melt and probably are genetically related to the low-K tholeiitic basalts in the area[14].

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