

# A note on the occurrence of anorthosite near Perinthatta, Taliparamba Taluk, Cannanore District, Kerala

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## Abstract

An anorthosite occurrence is recorded from the granulite terrain of Kerala. The anorthosite is massive, coarse and dark grey coloured showing variation from anorthosite to gabbroic anorthosite and extends over an area of 50 Sq. km as an elliptical body. The An content of plagioclase ranges from 58 to 75%.

## Geological Setting

The area under study forms a part of the highly deformed polymetamorphic terrain of the Peninsular Shield. The rock types include charnockites and pyroxene granulites, with sharp as well as gradational boundaries. Their width and dimensions show all variations from a few cm to a km or more. The anorthosite massif is emplaced within them. (Fig. 1).

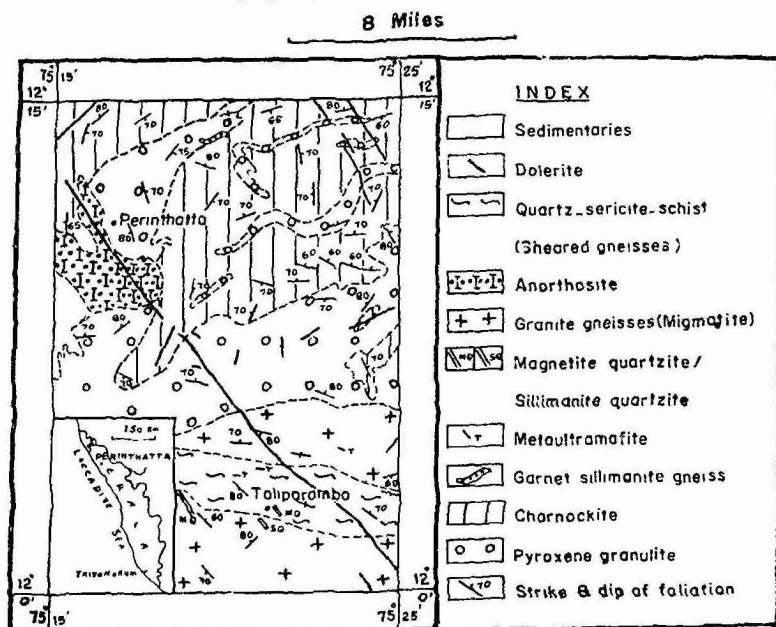


Figure 1. Geological map of the area around Taliparamba, Cannanore district, Kerala.

The Perinthatta massif is approximately elliptical in shape and spread over an area of more than 50 sq. km with a very irregular border and tongue-like projection into the country rocks. Though the contact relationship with the country rock is not always clear, it appears to be rather sharp. The body is not seen as a continuous outcrop, as it is extensively mantled by laterite. As such, its extension is inferred from the examination of a number of well sections and quarries.

A dolerite dyke cuts the country rock as well as the anorthosite in a general NW-SE direction on the eastern side of the massif. Towards west, the massif is mantled by laterites formed from the sedimentaries of Tertiary age.

## Petrography

The anorthosite is coarse to very coarse-grained, dark grey coloured, with greasy look and shows variations from pure anorthosite to gabbroic anorthosite and gabbro.

Anorthosite constitutes mainly the central part of the massif gradually changing to gabbroic anorthosite and finally to gabbro near the periphery, suggestive of zoning. Shearing indicated by mylonites has been noted at places. In contrast to the incipient migmatisation observed in the surrounding pyroxene granulites, anorthosite does not show any impress of migmatisation.

Plagioclase occurs as stumpy, tabular crystals of varying sizes (5 cm × 1 cm maximum). Twinning is clearly visible to the unaided eye. At places, as in more gabbroic varieties, the plagioclase is found twinned, with pyroxene in between. Polysynthetic twins are common. In many cases, the twin lamellae are bent and tapered. Wavy extinction is also noticed. Poikilitic texture is observed. Fracturing and protoclastic granulation are present, and some grains show clouding. Peripheral granulation is not seen. Although the feldspars are generally fresh and unaltered at places, development of calcite and scapolite are also seen after plagioclase. The modal composition corresponds to nearly 95% plagioclase and less than 10% clino pyroxene, apatite and calcite and magnetite. Apatite occurs in intergranular spaces. The gabbroic variants contain around 60% plagioclase, 30% clino-pyroxene, < 5% apatite, < 5% magnetite or ilmenite and > 2% biotite. Occasional grains of zircon are also noted. Determination of plagioclase in all variants by Federov's Universal stage gave An<sub>58-72</sub> corresponding to labradorite.

### Structure

The general E-W outcrop trend of the body is conformable to the regional trend of the country rocks. The plagioclase crystals in the massif also show preferred orientation in a general E-W direction. The regional foliation trends in the surrounding charnockites and pyroxene granulites dip towards the anorthosite body suggesting that the anorthosite was emplaced in a synformal structure as a phacolith. The flow banding in anorthosite indicates its syntectonic emplacement.

The presence of a major WNW lineament zone, a few kilometres south of the massif, which is in continuation to the Bavali lineament (Nair *et al*, 1975) is of significance. This lineament is picked up further east around Moyar and up to Cauvery. A series of basic plutons of gabbroic composition outcrop just north of the lineament.

### Conclusions

According to Windley (1973) the features characterising Proterozoic anorthosites are their coarse grained nature, dark grey colour, absence of layering as well as migmatisation. Since the Perinthatta anorthosite shows all these characters, it may be classed as a Proterozoic anorthosite. The hypidiomorphic texture with typical flow banding indicates that it is a normal magmatic intrusion emplaced syntectonically.

### References

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