

Clastic dyke from the Upper Cretaceous rocks, Tiruchirapalli area, South India

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During the course of geological investigation in and around Ariyalur, thin bands and layers of white to pale buff coloured clastic material were encountered at Kunnam, Tiruchirapalli district amidst brown calcareous shales and sandy clays of the upper Uttattur beds. The clastic material occurs as dyke, dyke-lets, apophyses, infillings of cracks or injections analogous to igneous intrusive structures.

Similar clastic dykes and injections are also noticed near Uttattur, Karai and Cullygudi (Dalmiapuram) of the investigated area. There seems to be no reports of clastic dykes from India, as far as the author is aware, except the one from Baga, northern Goa, by Wagle and Setty (1972).



Clastic dyke, Tiruchirapalli.

The clastic dyke is exposed in the nullah cuttings south of Ariyalur - Perambalur highway about 12.8 km from Ariyalur. The general trend of the dyke is $N35^{\circ}E-S35^{\circ}W$ with easterly dip of 70° to 80° . Its width is variable from 10 to 25 cm. There is lateral and vertical thinning as well as bulging in the dyke. Laterally, it can be traced for over 325 meters. In the SW direction it is found to be branching. One of the branches gradually tapers into the country rock and the other continues further and finally disappears under soil.

The origin of clastic dykes is related to processes penecontemporaneous with sedimentation. Based on the nature of formation they are of two types (Shrock, 1948): (1) those formed by the intrusion of clastic or fluid material derived from some underlying source, being emplaced under abnormal pressure; (2) those formed by the introduction of material from above, either under some pressure or by simple filling of a pre-existing crack or crevice. Each of the above mentioned types exhibit distinguishing features. In the present case there are no overlying beds to locate the source material from the top. Further the mica flakes and clay plates of the peripheral part of the dyke are oriented parallel to the wall. Such a feature is characteristic of the clastic dykes of the first type. Though there are no evidences of intermittent sinking noticed in the present area, recent work of Raiverman *et al*, (1966) and Sastri and Raiverman (1968) has revealed that there were block subsidences and fracturing during the Upper Cretaceous time in the Cauvery basin. It is interesting to note that the general trend of the dyke almost coincides with the fracture pattern in the rocks of the area.

Among the clastic dykes, sandstone dykes are very common. Though gravel, silt, mud, asphalt and bituminous sediments are also present. There are only very few of clay. Its clay material is white to pale buff in colour or even drab-yellow, streaked with yellow and brownish ferruginous stains. When wet it is somewhat sticky becoming harder on exposure. It has well developed slicken sides and regular cracks roughly perpendicular to the fracture wall. This can be seen very well on the weathered surface. The clay is very fine grained and well indurated. Besides the clay particles, fine grains of silica, mica flakes and ferruginous material are also found.

The X-ray and chemical analyses indicate the clay mineral to be of the palygorskite-sepiolite group. Detailed laboratory investigations of the clay sample involving X-ray and DTA is under progress.

Acknowledgement: The author acknowledges with thanks, Professor M. N. Viswanathaiah, Professor & Head of the Department of Geology, Manasa Gangotri, Mysore, for facility; Professor B. V. Govinda Rajulu, Department of Geology, for his helpful suggestions in writing this paper, and Dr. M. G. A. P. Setty, Oceanographic Institute, Panjim, Goa, for his critical comments. The financial assistance by U. G. C., Delhi, through the University of Mysore, Mysore is gratefully acknowledged.

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