

REVERSELY MAGNETIZED FLOWS, RAJAHMUNDRY, ANDHRA PRADESH

Basalt flows underlain by intertrappean beds occur at Kateru near Rajahmundry (lat. 17°04', long. 81°48') and Duddukuru (lat. 17°04', long. 81°25') on the eastern and western banks of the river Godavari on the eastern Indian coastal track. Stratigraphically, the latter is older than the former and the entire Trappean formation is sandwiched between Cretaceous (Sandstone, Limestone – infratrappeans, shale) and Miocene (Rajahmundry Sandstone, intercalated clay) sedimentary succession (Raju *et al.* 1965; Lakshminarayana *et al.* 1992). Based on the age of the intertrappean fossils, these volcanic flows are considered to be equivalents of the Deccan traps (Blanford, 1867; Sastri, 1981).

As part of a detailed palaeomagnetic investigation on different formations of India, Radhakrishnamurty (1963) reported the occurrence of normally magnetized volcanic flows at Kateru (Rajahmundry) as well as at Rajmahal in northeastern India. Using similar magnetic polarity signatures with steeper inclinations, the Kateru flows are correlated with Rajmahal volcanic flows of Jurassic age (Radhakrishnamurty, 1963). Recently, Baksi and Brahmam (1985) reported a K-Ar age of about 63 Ma for the Kateru outliers implying contemporaneity with the younger/last phases of the Deccan volcanism.

The problem of east coast volcanics and related volcanism with contrasting view points on the age (i.e., Cretaceous to Jurassic) provides a challenging opportunity to unfold this controversy. It is against this background, we revisited the Kateru and Duddukuru traps.

Here, we present our preliminary palaeomagnetic results on basalts from both these occurrences and report reversely magnetized flows at Duddukuru for the first time. The Duddukuru samples cover a recent quarry section lying adjacent to the National Highway (Calcutta-Madras) close to Duddukuru village, which was hitherto not studied by earlier workers. Spectacular fine grained columnar basalt flows characterize this quarry.

Natural Remanent Magnetization (NRM) directions on more than 120 cylindrical specimens cut from 12 oriented block samples, were measured before and after thermal demagnetization, using Molspin spinner magnetometer and Schonstedt thermal demagnetizer. The NRM directions of Duddukuru samples show normal declination and positive inclinations (average direction: $D=173$, $I=67$). In contrast, the rest of the sixty specimens from the Kateru area display normal declination with negative inclinations ($D=323$, $I=-64$). In general, both these groups show nearly stable direction, with certain amount of scatter. Six specimens each from normal and reversed flows were subjected to thermal demagnetization. The cleaned remanent magnetization directions are shown in Figure 1.

Based on geological studies (Raju *et al.* 1985), it is inferred that the reversed flows are overlain by normal flows. Assuming a younger age of Upper Cretaceous for the east coast volcanics, R/N magnetostratigraphic sequence may be comparable to the younger Wai Subgroup of the Western Deccan basalts Province (Subbarao, 1988). Detailed palaeomagnetic, rock magnetic and geochemical results and their implications to wider geodynamic problems form another paper.

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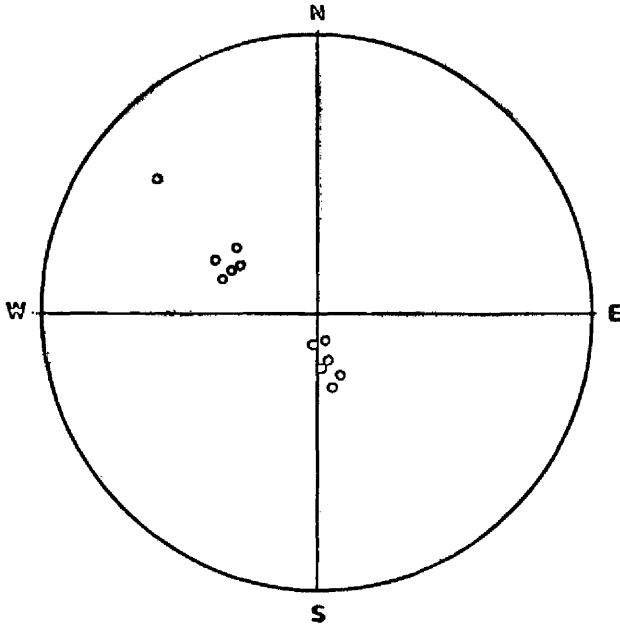


Figure 1. Stereographic projection of NRM directions obtained after thermal demagnetization. Open circles are the plots of normal polarity Kateru (Rajahmundry) basalt flows and solid circles represent reversely polarized Duddukuru basalt flows.

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*Department of Earth Sciences
Indian Institute of Technology
Powai, Bombay-400 076*

K. V. SUBBARAO
S. PATHAK

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