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Notes

DISCOVERY OF A NEW KIMBERLITE PIPE IN ANDHRA PRADESH BY STREAM SEDIMENT SAMPLING

A new kimberlite has been found about 10 km East of Lattavaram, Anantapur District, Andhra Pradesh (Lat 14°56′, Long. 77°23′). This is the seventh kimberlite in the Wajrakarur-Lattavaram area. The discovery came as a result of work under a UNDP aided project at the National Geophysical Research Institute (NGRI), Hyderabad, aimed at establishing workable methods and techniques for finding kimberlites in this region.

Fig. 1 shows the location of the new kimberlite along with the other six known kimberlite pipes in the area. Pipe 1 has been known for a long time (Murty *et al*, 1980). Pipes 2, 3 and 4 were discovered in the course of geological mapping (Satyanarayana Rao and Phadtre, 1966). Pipe 5 was also discovered during geological

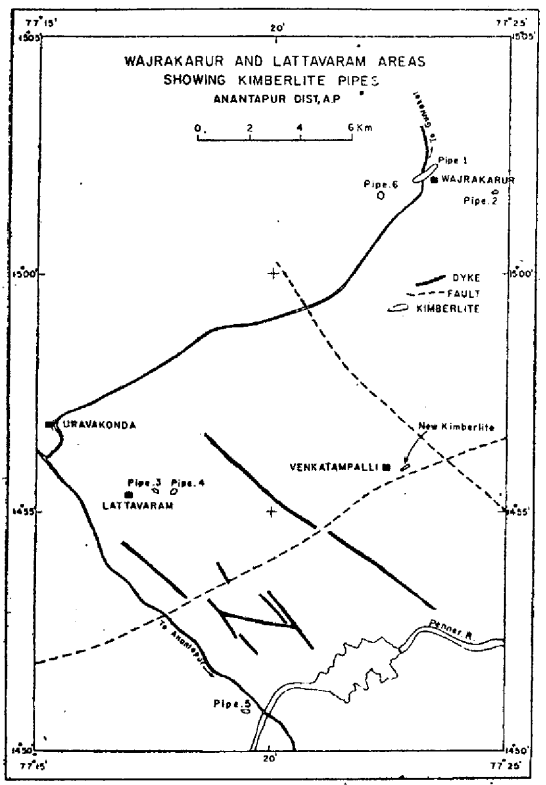

Figure 1. Locations of kimberlites in Wajrakarur-Lattavaram area, Andhra Pradesh. Note that the new kimberlite is close to the intersection of two large scale faults. (Locations of Pipes 1 to 6 after Murty *et al* 1980).

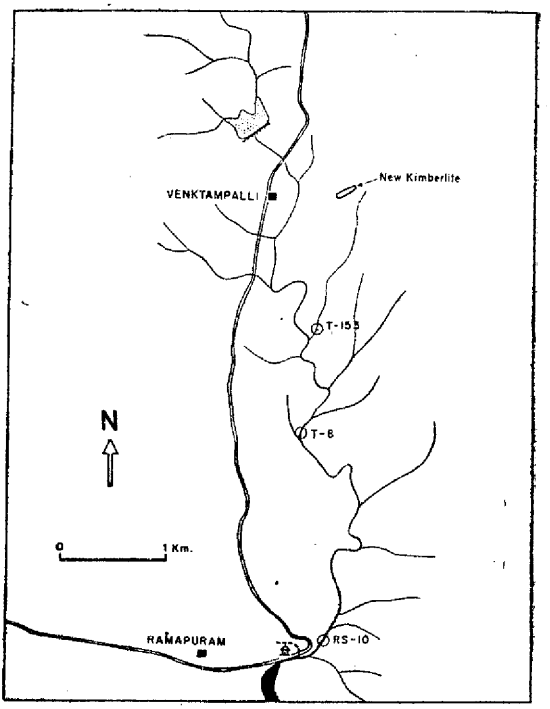

Figure 2. Stream sediment sampling leading to the discovery of the new kimberlite was made in this drainage system.

mapping (Reddy and Ballal, 1967). Geophysical surveys carried out by the Geological Survey of India (GSI) during 1968–69 revealed Pipe 6 near Pipe 1 (as quoted by Murty *et al*, 1980). Pipe 6 was fully covered by black soil which is quite extensive in this area, and had no surface expression.

These known kimberlites are rather poor in the classical indicator minerals, viz., pyrope garnet, picro-ilmenite and chrome-diopside. As such, it was believed that stream gravel or soil sampling in search of such indicators might not work as a method for discovering unknown kimberlites in this region (Paul, 1980 ; Krishna Murthy, 1981). Working on the known kimberlites, however, we found that with careful sampling and heavy mineral concentration, such indicators can indeed be detected even at distances of the order of 3 or 4 km from the kimberlites in downstream samples.

On the basis of this finding, a few streams north of the Penner river were sampled. One pyrope-rich garnet, about 900 microns across, found in a 60 kg sample in one of these streams (RS10, Fig. 2) was followed by sampling upstream. This led to a location (T8) where 11 pyropes, 2 chrome-diopsides and 32 picro-ilmenites, 300-900 microns, were found. From this point onwards, loam sampling on a grid pattern and closer stream sampling were appropriately combined. This follow-up led, through increasing sizes and numbers of indicators, to an area where clearly visible remnants of kelyphytic covers were seen on the garnets, reaction surfaces were recognizable on the ilmenites, and the proportion of chrome-diopsides were markedly higher (T153). Following this further upstream, an area was reached where loam samples, showed up to 260 pyropes larger than 500 micron, with some larger than 4 mm, and many chrome-diopsides and picro-ilmenites. The process involved the examination of a total of 287 samples in this stream system and adjoining ground. *In situ* weathered kimberlite was found in the area of largest incidence in two pits spaced about 300 m apart (Fig. 2).

It is not clear whether these represent one or two pipes, or a dyke. It is interesting, however, to note that these locations fall very close to a large-scale, approximately ENE fault which is seen in the aeromagnetic map of the area as a linear, and can be followed all the way to the margin of the Cuddapah Basin, and also over a large distance westward (Babu Rao, 1984). This left lateral fault displaces a number of dykes in the area SE of Lattavaram. It is likely that this fault had some role to play in controlling the emplacement found, and that there may be more kimberlites along this line. One major NW fault intersects this fault at a point not far off from the new kimberlite (Fig. 1).

Determination of the approximate shape and size of the kimberlite has been undertaken. Study of its chemistry, petrography and mineralogy will follow. At this stage, the most important thing to note is that this constitutes the first kimberlite discovery in this region through the application of the technique of stream sediment sampling.

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SHORT COURSE IN TRACE ELEMENT GEOCHEMISTRY IN IGNEOUS PETROGENESIS

Significant developments in trace element theory and analytical techniques have been made over the last 15 years to understand the formation and evolution of igneous rocks or their metamorphosed equivalents. High quality trace element data on well characterized rocks in terms of their field, petrographic and major element aspects are quantitatively modelled using available mineral-magma distribution coefficients data to evaluate the nature/extent of various petrogenetic processes such as different types of partial melting and crystallization, assimilation, mixing of magmas and sources and zone refining in the origin of igneous rocks.

In order to introduce the state of the art of trace element geochemistry in igneous petrology to geologists who want to understand the current literature in petrologic geochemistry and/or to make use of chemical data of their own rocks, the Geological Society of India proposes to organize this short course under their sponsorship. The course will be given by **Dr. V. Rajamani of Jawaharlal Nehru University,** New Delhi.

The contents of the short course include : atomic properties, Periodic Table and classification of elements, crystal chemical behaviour of transition metals and rare earth elements ; crystal chemistry of major rock-forming minerals with special reference to chemical substitutions ; thermodynamic aspects of chemical reactions and solution formation ; definition of major and trace elements and concepts of simple and exchange-reaction distribution coefficients ; review of petrogenetic processes of igneous rocks ; theoretical aspects of quantitative modelling of trace elements ; petrogenetic modelling using actual data on a variety of igneous rocks.

The short course will be of one week duration. It will include lectures, discussion, problem-set and exercises based on geochemical data of real rocks. The participation to the course will be limited to 20 geologists. Among the applicants preference will be given to those who are actively involved in the geochemical study of igneous rocks. The course will most likely be held at Hyderabad or Bangalore. Geologists interested in attending the short course may write to the Secretary Geological Society of India, Bangalore before 30th June 1986 for application forms and completed applications may be sent either to the Geological Society of India or to Dr. V. Rajamani, School of Environmental Sciences, Jawaharlal Nehru University, New Delhi-110 067 before 15th Aug. 1986.