

Biogeological Indicators in the Diamond Exploration in Bastar Region, Chhattisgarh, India

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Biogeological indicators have always been used in the mineral exploration. They may be classified into geobotanical and Geozoological indicators. Geozoological methods of mineral exploration, involve the use of animals, either directly or indirectly, while geobotanical indicators involve the typical clues through the study of plants.

In past as well, dogs have been used as mineral sniffers. Important clues and indications have been revealed through the biogeochemical analyses of honey combs, termite mounds, fishes other animals. In the field of Oil Exploration, most vital tool is the study of microfossils in the ocean beds.

Southern Bastar Region, Chhattisgarh, India has a huge potential of diamond mineralization, within the kimberlite and lamproite dykes of the Proterozoic age. Diamond exploration in the region is being carried out extensively with the help of both conventional and non-conventional methods of exploration. Apart from the conventional Geophysical and Geochemical methods, unconventional methods of using Etymological, Pedogenic & Biogeochemical Indicators and Geozoological Indicators are also applied.

The positive geochemical indicators include positive topographic indicators such as yellow and blue ground, presence of heavy mineral Pyrope, Ilmenite, Diopside, and 20-40 times enrichment of Ni, Cr, V, Sr, Zr, Nb, Ti and Ta. Positive Geophysical indicators include higher radioactivity due to Zr, Nb, Sr, Th and U and large positive Gravity anomaly.

The biological indicators play an important role in the location of kimberlite pipes in the region. These pipes are marked by the positive plant growth of abnormally higher size. This would have resulted due to higher content of K.P and Ti in the pipe rocks beneath, which act as nutrients. Similar pattern of plant growth have been found in the Hinota and Kimberly pipes as well.

Interestingly, many Geozoological indicators such as Termite Mounds and Fox holes have been helpful in discovery of similar kimberlite pipes in Orpha, Botswana and Mir, Russia, respectively. In Kimberly, Australia, studies have revealed that count of a bacteria "Bacillus cereus" has been found to be abnormally high in the vicinity of the kimberlite pipes.

Further intense investigations and research of the "biogeological indicators", along the same line, may lead to better understanding of more diamondiferous horizons in the region.

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