

## Scope for geobotanical prospecting for gold in Karnataka and Andhra Pradesh

I congratulate Mohan<sup>1</sup> for suggesting the possibility of phytomining of gold in Kolar Gold Fields. I wish to correct some points made by him.

– Kolar Gold Fields is situated about 15 km east of Bangarpet, which is a taluk headquarters.

– The Kolar Gold Mines are only 120 years old (1880–2000) and were successfully developed to a depth of 10,500 ft by excavating 1000 km length of tunnels after overcoming several technical challenges. In order to survive, the Bharat Gold Mines Limited (BGML) diversified into other allied fields like mine construction on contract; revival of gold mining operations in Andhra Pradesh, manufacture of mining equipments and recovery of schellite and gold from mill tailing dumps.

– The average grade of ore mined in the first two decades was 47.5 g/t and 41.9 g/t respectively. This high grade does not represent the *in situ* grade of ore body but represents the grade of the ore that was mined from the weathered and secondary enriched zone. The average grade of the champion lode from surface to 10,500 ft depth is 10 g/t.

– By 1949 the rich Champion lode was exhausted in the northern part and mining was switched over to a 4.5 g/t low grade oriental lode. This resulted in a steep drop in the overall grade of the ore. Further, the length of the Champion lode which was 8000 m on surface got reduced to 500 m at 10,500 ft depth due to the funnel shape

of the ore body. This reduced the life of Kolar Gold Mines.

As apprehended by Mohan, the mining and metallurgical practices in the Kolar Gold Mines were neither faulty nor outdated. In order to contain the cost of mining, the management took the following innovative measures<sup>2</sup>.

- Mill tailing sand was used for mine support in place of timber, concrete, etc.
- Deep hole drilling (25 m) and blasting.
- Establishment of rock mechanics division to understand the mechanism of rock bursts.
- Establishment of an exploration department to provide geological guidance to the mining operations.
- The heavy-duty stamp batteries were replaced by ball mills.
- 110 tonnes of schellite and 330 kg of gold were recovered by treating mill tailings.
- Revival of abandoned gold mine in Andhra Pradesh.
- Several national and international specialists in the field of mining, geology and metallurgy suggested improvements for the performance of BGML.
- But ultimately the mining operations of BGML at Kolar Gold Fields and also its satellite mines in Andhra Pradesh had to be abandoned in 2000 due to high cost of inputs and recurring financial losses.

Mohan's suggestion to extract gold by growing plants on mill tailings and on ore

zones is a welcome idea as it provides a new avenue for gold prospecting by adopting geo-botanical principles. This suggestion should be tested not only in Kolar Gold Fields but also in other gold fields in Karnataka, Andhra Pradesh and Kerala. In May 1979, scientists from Central Plantation Research Institute at Kasargod, Kerala collected several plant samples over the entire length and breadth of the Kolar Gold Fields to identify indicator plants for gold concentration. On their suggestion the BGML produced ash from the roots of certain plants which assayed no gold. Based on a study at the Fazenda Brasileiro Gold Mines in Brazil, using *Brassica* sp. and *Zea mays* as hyper-accumulator plants, Mohan suggests conducting such field experiments in Kolar Gold Fields to develop some economic models for revival of gold mining in KGF. I shall be happy to provide field guidance for any such field experiments.

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1. Mohan, B. S., *Curr. Sci.*, 2005, **88**, 1021–1022.
  2. Subbaraman, J. V., Ph D thesis, Sri Venkateshwara University, Tirupati, 1999.
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