

RESEARCH NOTE

OCCURRENCE OF GOLD IN BHIMA BASIN, GULBARGA DISTRICT, KARNATAKA

Bhima Basin, one of the Late Proterozoic sedimentary basins of Peninsular India, comprises of an alternating sequence of clastic and nonclastic sediments resting unconformably over the Archaean crystallines (granites, gneisses, patches of greenstones and basic dykes) and is exposed mostly in the Gulbarga district of Karnataka (Bruce Foote, 1876; Rao *et al.*, 1975). Rabanpalli Formation, which initiated the sedimentation of the Bhima Group, is a clastic sequence and has at its base a matrix supported quartz-pebble conglomerate. Gold occurs as detrital grains in this conglomerate in the Balashetihal (16° 23' 15" N; 76° 19' 45" E) area, Gulbarga district (Fig.1), and this is the first reported occurrence of gold from a Purana Basin in Peninsular India.

The basal conglomerate unit of Rabanpalli Formation, resting subhorizontally over granites, is 10 to 70 cm thick and consists of fine to medium pebbles as framework grains. The framework grains, which constitute 25 to 35 per cent of the rock, consists of quartz and fresh looking feldspar in a sandy matrix. The framework clasts are angular to rounded, but are mostly subrounded. The shapes of the framework clasts are spheroids (30-35%), discs (30-35%), rods (25-30%) and blades (5-10%). The sphericity (Pettijohn, 1975) of the pebbles ranges from 0.65 to 0.80. The conglomerate unit has two or more cycles of sediments, each cycle being a fining-upward sequence and the average grain size of an upper cycle is finer than that of the preceding cycle. Sandstone beds which pinch out laterally are present in the conglomerate unit. The matrix consists of subrounded and rounded sand grains of quartz and feldspar with occasional glauconite and minor clay. Cement consists of overgrowths on detrital quartz grains, carbonate and ferruginous material. The conglomerate is overlain transitionally by sandstone and/or mudstone.

Gold occurs as part of the matrix of the conglomerate in its entire thickness, and was recovered along with the heavy minerals. Gold occurs in the interstitial spaces of the sand grains as rounded, flattened and dendritic grains, ranging in size from 20 to 200 microns. Detrital gold grains are present embedded within the diagenetically formed silica overgrowths on detrital quartz grains. As gold is highly malleable, it has got sandwiched between the grains. About 30 specks (weight - 0.0004 g) of gold were recovered from a 250 g sample. Gold along with the heavy minerals was recovered from seven samples in this area with at least 7 to 8 specks in each sample. Heavy mineral concentrate weighing 0.28179 g, from a 200.18 g sample, analysed 508 ppm gold by AAS, which on recalculation gave 0.7 ppm gold for the whole sample.

The paleocurrent data from the cross bedding in the sandstones of the area, shows a west to westnorthwest current direction (Fig.1). Though imbrication is not well developed, there is general agreement with the current direction indicated by the cross bedding. Thus, it is suggested that the gold, which occurs as placer, in the conglomerate is most likely derived from the auriferous Mangalur/Hatti greenstone belts lying to the northeast and southeast.

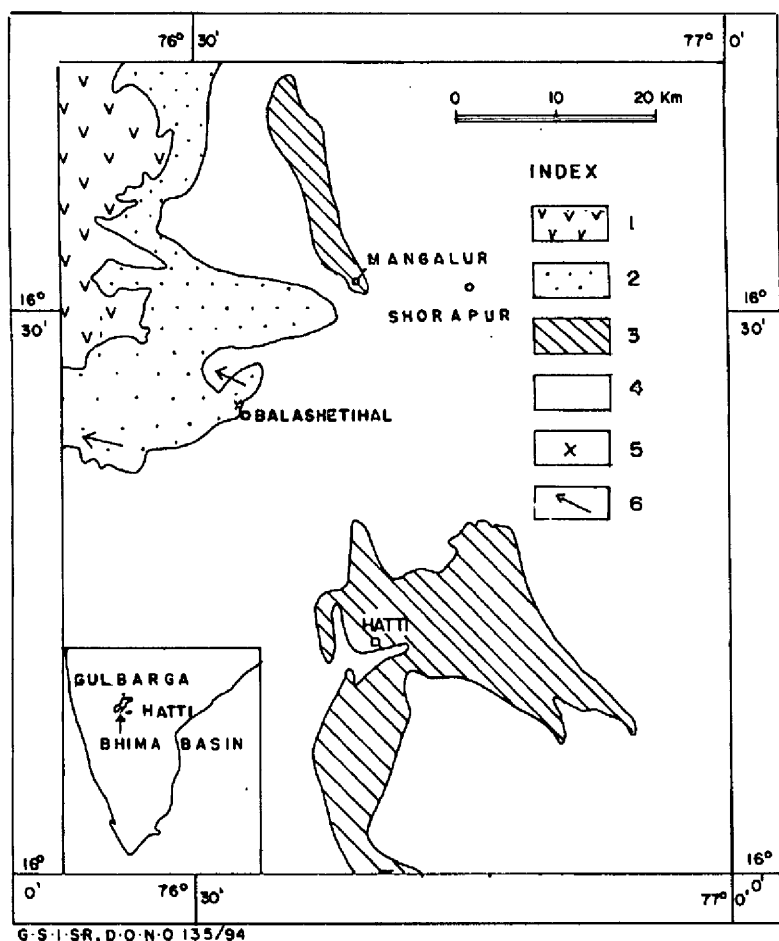


Fig.1. Map showing occurrence of gold in Bhima sediments, Gulbarga district, Karnataka. 1. Deccan Trap, 2. Bhima sediments, 3. Greenstone belts, 4. Granitoids, 5. Location of gold occurrence, and 6. Paleocurrent direction.

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