Occurrence and Identification of Accessory Phosphate Minerals in the Gold Mineralized Zones and Zirconolite in Dykes, Dharwar Craton, India

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Reporting here the occurrence of hydrothermal monazite and xenotime in alteration haloes associated with the gold-mineralized zones of the Hutti, Gadag and Ajjanahalli Gold Deposits and also presence of the zirconalite in the dolerite dykes in Dharwar craton, India. These minerals were identified by systematic scanning of polished thin sections under the Scanning Electron Microscope (SEM) using backscattered electron and energy dispersive X-ray detectors. Most of the grains are very small (<10 µm), although some larger grains (30-40 µm) have also been identified. Hydrothermal monazite and xenotime, though volumetrically minor, have been found to be important components in many orogenic gold deposits in Australia, Canada, Brazil and South Africa, as they form a part of the primary ore mineral assemblage, either in ore-bearing veins itself or are intergrown with ore minerals in wallrock alteration zones. Both monazite and xenotime are excellent geochronometers, and their importance is that they allow precise ages to be obtained for gold mineralization events. The discovery of these minerals in hydrothermally altered rocks from these gold deposits, Dharwar Craton enables us to estimate the age of gold mineralization event(s). Identification of zirconalite in the mafic rocks like dolerite dykes which contains good amounts of Uranium, thorium gives an opportunity to obtain precise ages of these mafic rocks which are otherwise difficult to date.

Keywords: Dharwar craton; monazite; xenotime; zirconalite.