Geological Characteristics of the Özyurt Gold Deposit: The Discovery of a Shear-Hosted Orogenic Gold Deposit in the Niğde Massif, Central Türkiye

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Özyurt is a gold deposit located in the Niğde massif, forming the southernmost tip of the Central Anatolian Crystalline Complex. The massif is an extensional metamorphic core complex composed of Palaeozoic-Mesozoic–aged marbles, gneisses, quartzites, and amphibolites cut by Cretaceous (80–76 Ma) aplitic-pegmatitic dikes. Three detachment planes developed between metamorphic units characterized by ductile to brittle features. The upper detachment plane hosting the main mineralisation is characterized by cataclastic breccias. The N-S–trending, 23° to 40° E-SE–dipping main detachment plane and related second-order low-angle shear zones brought on cataclasis and extensive brecciation. Along the first- and second-order shear planes; high-angle normal faulting controls karstification and widely developed karstic breccias. Gold mineralisation at Özyurt occurs as both sulphide and oxide ore. Low-grade (up to 1 ppm Au) sulphide ore is characterised by discontinuous sulphide lenses within cataclastic breccias and sulphide veinlets or disseminations within chlorite-illite-calcite-siderite–altered amphibolite schist interlayers above and below the detachment plane. Main sulphide phases are pyrite and arsenopyrite accompanied by cinnabar, stibnite, galena, and chalcopyrite. Oxide ore represents weathered and supergene-enriched domains of the same sulphide ore. High-grade gold (locally up to 180 ppm) mineralisation within the oxide ore is associated with goethite-hematite-jarosite-ankerite–rich cataclastic and karstic breccias. Oxidation and deformation are intense along cataclastic and karstic breccias, where these are intersected by high-angle faults resulting in very high gold grades. Özyurt is interpreted as a shear-hosted gold deposit showing many similarities to orogenic gold systems. The Niğde massif, however, is still underexplored in terms of orogenic gold mineralisation and bears potential for discovery of similar mineralisation styles. In fact, Özyurt is the first economic deposit of this kind identified in the Niğde massif and puts forward a broad district for detachment fault-style orogenic gold mineralisation in greenschist facies rocks of the massif.