

Origin of detrital gold in the Coastal Range between 41°-42° Lat. S, Chile

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A morphoscopic and geochemical study of gold nuggets, combined with a study of the related heavy minerals fraction, have been used to understand the origin of the detrital gold contained in several placers deposits mainly hosted in fluvial sediments in the Coastal Range.

The results indicate that most of the gold particles have flake shapes and are strongly flattened, so the average Cailleux Flatness Index ($\text{lenght} + \text{breadth} / 2 * \text{thickness}$) is near 14. These grains present folded edges, impact and/or striation marks, Fe-oxides and/or clay covers and have Au-enriched rims related to the particle core. All of these features suggest a long transport for the detrital gold. Furthermore, the high core fineness found in these gold grains suggest acid-sulfate epithermal deposits like the probable primary source of mineralization, although do not discard other kind of deposits. The heavy minerals fraction study indicate the contribution of sediments almost exclusively from the Andean Range located far east of the Coastal Range. In the other hand, the Central Valley, located in between both ranges, is filled with glacial deposits bearing gold particles with similar morphological and chemical characteristics as those of the Coastal Range.

Therefore, all of these results suggests that most of the detrital gold of the Coastal Range has been transported from east to west by glacial agents nearly 100 km from its primary deposits in the Andean Range.