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## A PRELIMINARY SEDIMENTOLOGICAL AND GEOCHEMICAL APPROACH TO APPRAISE GOLD OCCURRENCES IN GIN GANGA SEDIMENTS AT NELUWA, SRI LANKA.

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### Abstract

As a precious metal, gold can occur naturally as native form since its least reactivity. It commonly exists as dendritic formations, nuggets and grains in rocks, whereas cumulates, fragments and flakes in alluvial deposits. Since, known economic grade gold deposits have been emplaced extensively during Precambrian era, there is a very high potential to exist such gold formations associated with Precambrian crystalline terrain of Sri Lanka. Considering this high potentiality and Gondwana linkages to Pan-African tectonic events, several investigations have been conducted by some researchers and reported existence of alluvial gold cumulates among some stream bed loads. Although some clues on gold occurrences in Gin ganga river have been reported in newspapers, there is not reported scientific investigation to appraise the gold occurrences in Gin ganga river basin. Therefore, this study aims to appraise gold occurrences in Gin ganga at Neluwa area. Collected bed load sediments samples were dried in oven under 110°C and then sieved using 2.36mm, 600µm, 300µm and 75µm sieves. Pan fraction of each sieved sample passed through 75µm sieve, was analysed using X-Ray Fluorescence spectrometer for its gold content. Retain fractions on 2.36mm, 600µm, 300µm and 75µm sieves were carefully analysed under metallurgical zoom microscope. The microscopic observations and geochemical results indicated that the studied samples are enriched with gold contents. During microscopic observations, small fragments of gold were observed within the 600µm, 300µm and 75µm size black colour sand fractions in bed load sediments. Also,  $7.72 \pm 0.01$  ppm level of average gold concentration was detected associated with fine size bed load sediments. These laboratory investigation results were further proved by an illicit gold prospector accidentally found during the field. Therefore, there is a possibility to extract approximately one sovereign pound of gold fragments as secondary alluvial gold fragments by washing one tonne of black sands in bed load sediments of Gin River close to the Neluwa area. Since this gold concentration is quite comparable with current cut-off grade of globally operating gold mines, further studies are required to assess the economic feasibility and model the formation conditions of this gold occurrence.

**Keywords:** *geochemistry, gold, sedimentology, Gin ganga*