

**AN ASSESSMENT OF ECONOMIC HEAVY
MINERALS ASSOCIATED WITH GEM BEARING
GRAVEL LAYERS IN KIRIELLA DIVISION**

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Abstract

Although Sri Lanka is world famous for its abundance of gem minerals, a scientific study on other economically important minerals associated with gem bearing sediments has not been conducted. During the gravel washing, the sediments which have the grain size higher than around 2 mm remain in the panning bucket, while rest finer portion fills into the panning pit. This study was focused on assessment of economic minerals associated with Kalu Ganga gem bearing sediments in Kiriella Division, Ratnapura. The wash dirt which represents the gem bearing layer was used for the assessment. In order to determine the economically important heavy minerals present in the wash dirt and the relationship between the grain size and the heavy mineral content, selected grain size fractions of wash dirt (1 mm +500 μ m), (-500 μ m +250 μ m), (-250 μ m +125 μ m) and (-125 μ m +75 μ m) were undertaken for heavy mineral separation by magnetic separation and bromoform separation. Petrographic microscope analysis reveals that the wash dirt is essentially composed of ilmanite, garnet, zircon, magnetite, spinel, and sillimanite, with trace amount of rutile, pyrite, monazite and corundum. Statistical analysis of data reveals that the panned gem bearing gravel layer contained 31.58% of average magnetic heavy minerals and non-magnetic heavy minerals, and have an inverse relationship between the grain size and the weight percentage of heavy minerals. As well as the weight percentage of the magnetic heavy minerals increases as the grain size decreases, the weight percentage of non-magnetic heavy minerals is decreasing, as the grain size is decreasing, and the total heavy mineral (magnetic heavies and non-magnetic heavies) weight percentage is increasing while the grain size is decreasing. The highest heavy mineral accumulation is in the northern part of the study area with a decreasing trend from high-elevated area to low. The observed variation in the distribution of heavy minerals in the study area and the roundness of the grains showed that the sediments have been transported from a same source at high-elevated area. It was showed that wash dirt does not have the required "Concentration Factor" and grade to mine them economically. Therefore, the economical feasibility for extraction of heavies from wash dirt is not much effective.

Key words: Heavy Minerals, Wash Dirt, Alluvial Gem Deposits, Magnetic Heavies, Non-magnetic Heavies, Kiriella Division