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Potential use of indicator minerals for sedimentary gem exploration: a case study from the Kukule Ganga basin, Sri Lanka

The presence and the distribution of heavy minerals such as ilmenite, garnet, sillimanite, monazite, rutile, zircon, magnetite, tourmaline, spinel, corundum, allanite, fluorite and topaz in the heavy mineral fraction of the stream sediments samples of the Kukule Ganga basin were studied. Panning, sieving, heavy mineral separation and magnetic separation methods were used to concentrate the heavy minerals from the stream sediments. Grain mounting on glass slides was done for the purpose of microscopic identification of the very fine heavy mineral concentration of +125-150 μm and +150-180 μm mesh sizes.

Though the presence of corundum is recorded in parts per thousand range in only a few samples, it indicates the possible occurrence of gem minerals in the study area. Spinel, garnet and zircon were recorded high ranges of weight percentages while tourmaline, fluorite, topaz, monazite and allanite recorded rather low weight percentages of total heavy minerals. However this presence of such minerals could be used as indicators of rare earth element bearing minerals and pathfinders of gem minerals.

Some samples show higher concentrations of sillimanite and other transparent and translucent heavy minerals rather than ilmenite that indicating higher quantity of indicator minerals.