

Garnet rich mineral sand based filter media for Removal of fresh water algae

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Algal blooms have become a stigma for present day stagnant surface water bodies. Therefore, consumption of water without treatment would be harmful. Garnet granules have the ability of reduction of bed expansion and particle abrasion in multi-media filters during back flushing due to its high specific gravity and high hardness. In this study, garnet granules separated from beach sand in southwestern coastal area in Sri Lanka were investigated as a filter media to remove fresh water algae. Microscopic and particle size analysis indicated that the beach sand consists predominantly of garnet, quartz and ilmenite. The garnet grains are round to elongate shaped in the size range between 1 mm and 0.15 mm. Particle size and shape of the extracted garnet are optimum for the use as water filtering medium. Garnet enrich fraction grains (1 mm — 0.15 mm) were further concentrated by density separation via panning. Algae samples from Beira Lake, Colombo were collected, in the depth at illumination level 1% from surface. Algae were grown giving nutrient, sunlight and aeration. Nutrient medium used was the Bristol solution. For varying flow rates, algae filtered through 0.50 mm and 0.15 mm sieved fractions. Parallel determination for the efficiency of the filter bed with time was done and turbidity was measured by turbidity meter. When considering the algae filtration, removal of *Microcystis* is efficient for 0.15 mm panned fraction. Removal of *Closterium* was not efficient probably due to shape of the organism. *Chroococcus* and *Volvox*, were not removed well possibly due to their small size. Removal of algae was decreasing with the time from both filter beds. The study concludes that prepared garnet filter is useful in filtering *Microcystis* and further modifications should be done prior to use as a filter.

Keywords: Algae, Garnet, Panning, Filtration, Mineral sand