

ABSTRACT

An indigenous strain of the purple non-sulphur phototrophic bacterium, *Rhodospseudomonas palustris* strain B1 was optimized for growth and then immobilized in 4% (w/v) agar for the treatment of sago effluent.

Growth of *R. palustris* strain B1 was optimized in synthetic medium with starch as the primary electron donor. The optimal conditions for cultivation were at pH 7, temperature 25 °C, light intensity of 5 klux with a 5% 48 h old inoculum. Under these optimal conditions, maximum biomass of 8.1 g/L was obtained after 72 h under anaerobic-light culture conditions.

Immobilization of the cells with 4% agar was favoured over alginate and carrageenan. Entrapment with agar gave solid beads that were rigid and uniform in size. There was a 82% reduction in the Chemical Oxygen Demand (COD) of the sago effluent after 4 days of treatment under anaerobic-light conditions.

Further investigations showed that mixing and inoculum size did not significantly affect the COD removal. However, the immobilized cells retained 89% of their activity after the third consecutive recycling and 58% after the fifth consecutive recycling of fresh batches of sago effluent under anaerobic-light conditions.