

## Isolation of natural pigments with potential photosensitizing property

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Potential photosensitizing property of three new natural plant pigment-extracts and variation of their UV-vis spectra with pH have been investigated. The pigment-extracts were obtained from fruits of *Basella alba* (spinach), *Brassica oleracea* (red cabbage) and sawdust of *Artocarpus heterophyllus* (Jack tree). The extraction efficiency of the pigments of fruit of spinach into water, ethanol and methanol was also studied at three different temperatures. The best extraction efficiency was achieved in water at low temperature, however, the stability of the spinach pigments in water was very poor. Therefore, pigment mixture of fruits of spinach extracted into 80% methanol, which was quite stable at room temperature was used for further studies. The colour of this pigment extracts remained unchanged under acidic conditions. The variation of  $\lambda_{\max}$  of the UV-vis absorption spectrum of the pigment extract with pH was studied. A hypsochromic shift of the spectrum was seen, indicating a decrease in conjugation with increasing pH. Photosensitizing nature of this pigment extract was studied by preparing a Dye Sensitized Solar Cell (DSSC) and found to be effective in photosensitization. Pigments of red cabbage were extracted into water and the variation of  $\lambda_{\max}$  of the UV-vis spectrum of this pigment-extract with pH was also studied. It showed a bathochromic shift of its  $\lambda_{\max}$  with increasing pH. This pigment extract also showed photosensitizing property when used in DSSC. The pigments of sawdust of Jack tree were extracted into dilute NaOH and the variation of UV-vis spectra of this pigment extract with pH was also studied. This pigment extract did not show any photosensitizing properties when used in DSSC. Pigment extract of this species was found to be highly fluorescent and could well be the reason for poor sensitizing property in solar cell.

Key words: DSSC Pigments, fluorescence, photocurrent

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