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POTENTIAL EXTRACTION OF PHOTOSYNTHETIC PIGMENTS (CHLOROPHYLLS A, B AND CAROTENOIDS) BY THREE SOLVENTS

T. Sasmina and M.I.S. Safeena*

Department of Biological Sciences Faculty of Applied Sciences, Sammanthurai
*safeenim@seu.ac.lk

As photosynthesis is the basic process during which light energy is absorbed and converted into organic matter, the importance of the plant pigment chlorophyll (a and b forms), carotenoids and anthocyanin are very significant. It is crucial that accessory pigments (carotenoids and anthocyanin) take part in an intermediary transformation of the absorbed solar energy to the primary pigment's chlorophyll a and b. In addition, chlorophyll can substitute synthetic dyes which may affect health and natural green pigments are used in many industrial branches including food, drinks, soap and cosmetics. Present investigation was performed to compare the yield difference of photosynthetic pigments of three varieties of *Amaranthus* (family *Amaranthaceae*) extracted using Ethanol, methanol and acetone and assessed in UV-Visible spectrophotometer. Two grams of fresh leaf was extracted in 10 ml of each solvent. The concentrations (µg/ ml) of chlorophyll a, chlorophyll b and carotenoids (C x+c) were determined by different equations suggested by Porra et al (1989) and Lichtenthaler (1987). The concentrations obtained through the above equations were finally interpreted in % with reference to fresh weight. Different trend was observed in extraction rate for chlorophylls and carotenoids. All three solvents showed a significant variation (P=0.05) in concentrations of chlorophylls a, b and carotenoids through spectrophotometric analysis. Among the solvent tested, the extraction using acetone produced the highest amount (µg/ ml) of chlorophyll a (76.4%) and Carotenoids (30.6%). Similarly, methanol was good for extracting chlorophyll b (28.4%). Accordingly, the descending order of solvents producing amount of photosynthetic pigments were as follow, for chlorophyll a: acetone> ethanol> methanol, for chlorophyll b: methanol> acetone> ethanol and for carotenoids: acetone> ethanol> methanol. It has been proven that acetone was the best solvent to extract chlorophyll a and carotenoids and this experiment clearly indicate that extraction of photosynthetic pigments by different solvents are depends on chemical nature of bio-molecules (chlorophyll-a, chlorophyll-b and carotenoids). Though slight variations persists among the experimented plants/species even for same extractant solvent which can be attribute to inherent physiological characteristics of individual species. Temporal and seasonal changes and local geological condition can also be the reason for variations in pigment concentrations in plants, therefore further study in this context is recommended.

Keywords: *Potential extractions, photosynthetic pigments, solvents*

**Corresponding Author*