

Mass spectrometry identification of pathogens in various sample solutions using functionalized magnetic iron oxide (Fe₃O₄) nanoparticles

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The textile industries show a significant increase in the use of synthetic complex dyes as colouring material. Dyes, like other chemical substances, may be capable of producing adverse health effects to living organisms. There is an increase of environmental contamination caused by the large amount of dyes involved in the textile process that are discharged in the liquid effluents. Therefore, natural dyes are now given more importance. Many researches are being undertaken for extraction of dyes from different natural colouring sources. The study was aimed at producing eco-friendly and efficient dyes from certain native flowers like Marigold, Hibiscus, Gomphrena, Dahlia and Oleander collected in and around Erode district, Tamilnadu.. The crude dye stuff was extracted by the method of boiling. The effect of different times and temperature regimes on the extraction of dye stuff and the antibacterial activity of the crude dye stuff against various Gram's positive and Gram's negative bacterial species were studied. The effect of the synthetics mordants like Potassium dichromate, Copper Sulphate, Alum and Ferrous sulphate on dyeing efficiency was compared to that of the natural mordants like lime and vinegar. The wash fastness, light fastness and abrasion fastness to infer the dyeing quality. The wastes after dye extraction were used as biofertilizer. The selected native flowers showed good dyeing properties. Hibiscus and marigold dye extracts gave brighter shades compared to the other flowers. Wash fastness was significant in hibiscus, gomphrena and marigold dye stuffs that were treated with potassium dichromate. Light fastness was efficient in hibiscus and the rub fastness was notable in marigold dyes. The synthetic mordants like potassium dichromate and copper sulphate and natural mordants like vinegar were effective. This method proved to be a cost effective and eco friendly alternative to the commercial synthetic dyeing. Future work will be focused on large scale extraction of dyestuff by standardizing optimum mordant concentration and usage of these natural colourants in food. Ultimate objective is to provide an effective alternative for the chemical textile dyes and food colourants.

Keywords: Natural dye, Antibacterial activity, Boiling, Mordant, Wash fastness, Light fastness and Abrasion fastness.

Biography

C. Monica is currently studying her undergraduate degree in Biotechnology at K.S.Rangasamy College of Technology, Tiruchengode, Namakkal District, Tamil Nadu, India. She has published around 10 papers in various national and International conferences. She is a recipient of "Summer Research Fellowship" offered by Indian Academy of Sciences, Bangalore during the academic year 2011-2012. She is serving as an Editor-in-Chief for Biozoom magazine released by Department of biotechnology, K.S.Rangasamy College of Technology.

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Biotechnological strategies for enhanced production of secondary metabolites from plants

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Plants are rich source of alkaloids, steroids, terpenoids, phenolics, sweeteners, bittering agents, pigments and perfumes. These are used as source for large number of industrial products, including agricultural chemicals, pharmaceuticals and food additives. There is a continued commercial demand for these metabolites in food and pharmaceutical industries. Earlier the production of plant secondary compounds was achieved through the field cultivation of plants. It is difficult to cultivate some plants outside of their original ecosystems. The isolation of these compounds through the extraction of organs and seeds of whole plants is difficult and costly. Various methods in biotechnology, like free cell suspension culture, elicitation, immobilization and biotransformation has been developed to accumulate desired products. Currently, much interest is focused on the large-scale culture of plant cells as sources of commercially important secondary metabolites. The present review is focused on biotechnological strategies developed so far to enhance secondary metabolites production.

Keywords: Plant cell cultures; Secondary metabolites; Elicitation; Bioreactors; Biotransformation; Hairy root cultures; Immobilized cells.

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