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RESEARCH ARTICLE

Investigating the Suitability of *Butea monosperma* flower extract as Colouring agent for Paediatric syrup

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ABSTRACT

Objective: To investigate the suitability of *Butea monosprrma* flower extract as colouring agent for paediatrics syrup.

Method and Materials: The plant parts which are used in experimental work for investigating the suitability of *Butea monosperma* flower extract as colouring for paediatric syrup .1kg of dried *Butea Monosperma* flowers were weighed out and spread out in a thin layer. After authentication, a 1kg sample of *Butea monosperma* was washed for ten seconds in water (to avoid losing colour). Excess water was blotted from the sample with a clean towel, and dried in a hot air oven for four hours at 300 C. of the extraction procedure. Then the solvent for extraction (water, drug solvent ratio taken = 1:8) wasfilled. After completion of the extraction procedure the extract was taken out and evaporated up to semisolid consistency and then amount in percentages was determined in % w/w.

Result: The plant *Butea monosperma* is very popular among the peoples of Northern Ghana, where the leaves are used in soups; and calyces for soft drinks and also used medicinally. It has been found to possess several health benefits the flower have a very rich orange colour, which this study aims at investigating its suitability as a colouring agent in pharmaceutical syrup

Conclusion: the colour extract from *Butea monosperma* is found suitable as a pharmaceutical colouring agent, and then Tartrazine can be replaced with this natural source of colour, promoting the health of our people.

Keywords: *Butea monosperma* extracts, Tartrazine, Paediatric syrup

1. INTRODUCTION

Tartrazine widely used as colouring agent in pharmaceuticals has been found to be carcinogenic, If the colour extract from *Butea monosperma* is found suitable as a pharmaceutical colouring agent, then Tartrazine can be replaced with this natural source of colour, promoting the health of our people. [1] The search for colouring agents with minimal or no toxic side effects has led to the discovery of several plant parts yielding various colours for food, cosmetics, textiles and some pharmaceutical dosage forms. Plant colour has been found to contain flavanoid. Tartrazine widely used as colouring agent in pharmaceuticals has been found to be carcinogenic, if the colour extract from *Butea monosperma* is found suitable as a pharmaceutical colouring agent, and then Tartrazine can be replaced with this natural source of colour, promoting the health of our people. Colours actually make food appear good and more appetizing. Different food colours and dyes are included to add a zing to the food. All these food colours are food dyes and colourings that occur either naturally or are created artificially. In technical terms, a food dye is a food additive substance that is added to the food to change or improve the food colour. [2]

2. MATERIALS AND METHODS;

Materials

Procurement of material

Butea monosperma and Tartrazine were purchased from the local market of Mandsaur M.P.

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Procurement and selection of plants.

Method of extraction from *Butea monosperma* flower

The powdered drug was weight and filled in the thimble of Soxhlet apparatus. After that the thimble was foxed with the round bottom flask, and the assembly was attached to the condenser. And the paraffin wax was put at the joints of the assembly for the easy removal of the assembly at the completion of the extraction procedure. Then the solvent for extraction (water, drug solvent ratio taken = 1:8) was filled. After completion of the extraction procedure the extract was taken out and evaporated up to semisolid consistency and then amount in percentages was determined in % w/w. [3]

Solvent system – water

Drug solvent ratio-1:8

Time of extraction- 16

Temperature for extraction- 60-70°C

Identity Test for Tartrazine Powder

To 50mg of tartrazine powder was added 200mg of powdered sodium hydroxide. The mixture was transferred to a small test tube, and heated in a flame to fusion. Heating was continued for five seconds, cooled and 0.5ml water added. Ten milliliters of dilute hydrochloric acid was added and warmed. The result was observed and recorded. [4]

Microbial Test of the Extract of *Butea monosperma* flower

A 5% w/v methanolic solution of *Butea monosperma* extract, as well as a 5% w/v aqueous solution (using sterile water) was prepared. Ten plates filled with nutrient agar were obtained; five for aqueous (sterile) extract tests, and five for methanol. In each nutrient agar were cut single bores, using a sterile borer, into which were placed sufficient amount of 5% metabolic extract of *Butea monosperma* or 5% sterile aqueous extract. [5] Streaks of *Escherichia coli, proteus vulgaris,klebeisella pneumonia* were done separately on individual nutrient agar, streaking from the edges of the rectangular holes, towards the edges of the Petri-dishes. The same procedures were repeated, using tartrazine powder. The plates were incubated for 24hours at 37°C, and the lengths of inhibition of growth of the various micro-organisms measured and recorded. To serve as control, the above procedure was repeated, using pure. [6]

Chromatographic Analysis of Extract of *Butea monosperma* by HPTLC. [7]

Preparation of standard

Pure standard dissolved in methanol

Instrument and method (specifications)-

Sample solvent type −Methanol

Stationary phase −HPTLC Percolated, silica gel 60 F_{254} (MERCK KGaA)

Plate size (X × Y) −5.0 x 10.0 cm

Drying device −Oven temperature 60 ˚C for 5 Minutes (for plate);

Calibration mode −Single level

Evaluation mode − Peak area

Sample applicator −CAMAG Automatic TLC sampler Limo mat 5

Number of tracks −2 in form of bands

Distance between tracks − 20 mm

Syringe size −100 µl

Application position Y –8.0 mm

Application volume −2, 4 µl

Band length − 8.0mm

Mobile phase − Chloroform: Methanol

Derivatization –Vanillin–sulphuric acid reagent (temperature 120 ˚C for 20 min;

Detection –scanning wavelength 200-450 nm:

Measurement type –Remission:

Measurement mode −Absorption

3. RESULT

Microbial Test of the extract of *Butea Monosperma* flower

Fig 1: Antimicrobial activity of *Butea monosperma* extract against *E. coli*.

Fig 2: Antimicrobial activity of *Butea monosperma* extract against *proteus vulgaris*

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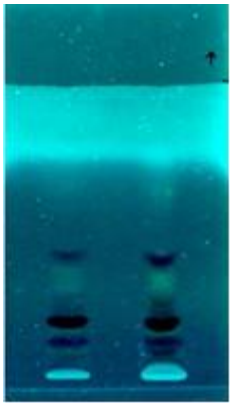
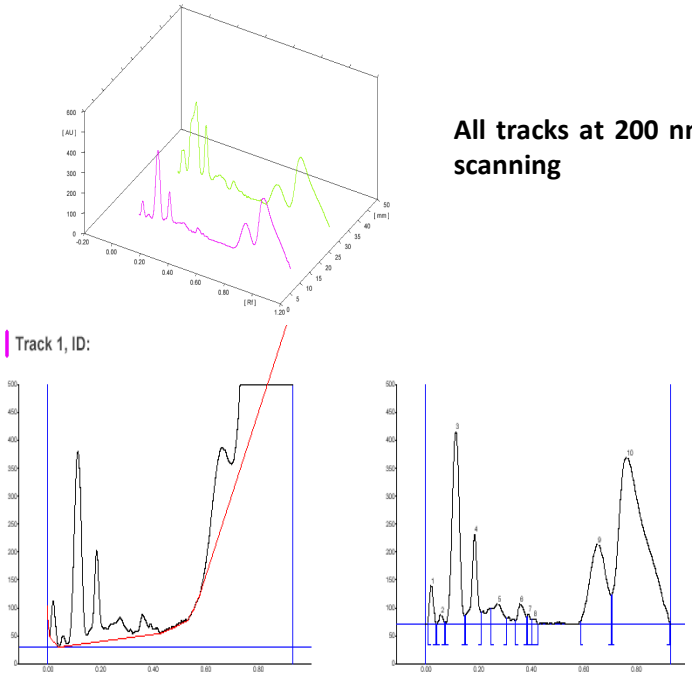


Photodoc at 265 nm

Photodoc at 366 nm



All tracks at 200 nm scanning

Fig 3: HPTLC Analysis for *Butea monosperma* Extract
All tracks at 200 nm scanning

4. DISCUSSION:

The yield was very encouraging, implying that the use of *Butea monosperma* extract as a colouring agent is cost effective.Colour, taste; odour and form of the *Butea monosperma* conform to general description of samples described on the internet. [8] Colour value obtained (0.258) conformed to the BP standard, and was retained within BP Standards for up to six months.Microbiological tests revealed that *Butea monosperma* extract has antibacterial properties but very little artifungal properties; thus substantiating folklore medicine claims as to its use in healing syphilis, gonnorhea and other bacterial infections. Methanolic extracts had better antimicrobial activity. [9] Tartrazine had no antibacterial and no antifungal properties; thus *Butea monosperma* has a great advantage over amaranth in its use as a colouring agent. [10] Tartrazine, being synthetic and highly concentrated into a powder form has an advantage of being used as a 1% or 2% solution; whereas a 33% solution of aqueous extract of *Butea monosperma achieved* the same colouring effect. Nevertheless, the health benefits of the natural product outweigh this disadvantage; especially since amaranth has been found to be carcinogenic. [11] The pure extract and pediatric syrups formulated with the extract are best stored at room temperature and also at 37^0c generally, all pediatric syrups must be stored in amber bottles to avoid exposure to light which causes loss of colour and potency of the drugs. pH was found to decrease with time, though Pediatric Syrups coloured with amaranth had a slower decrease than those coloured with extract of *Butea monosperma* . Using citrate buffer to attain pH 5 provided good pH stability over the four month test period.
Syrups Paracetamol Syrups and Paediatric Cough Linctus.[12] The study results suggest that colour extract from *Butea monosperma* flower may be used as colouring agent for paediatric syrups.

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Conflict of Interest: None Declared

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