



DEVELOPMENT OF DETOX CAPSULE USING NATURAL INGREDIENTS AND STUDY FOR ITS NUTRITIONAL PROPERTIES

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Abstract: Gelatin possesses five basic properties that make it suitable for the manufacture of capsules: It is nontoxic, widely used in foodstuffs, and is acceptable for use worldwide. It is readily soluble in biological fluids at body temperature. It is a good film forming material producing a strong flexible film. Gelatin is a substance of natural origin that does not occur as such in nature. Gelatin is a heterogeneous product derived by hydrolytic extraction of animal collagen, a natural protein, which occurs in the skin, bones and connective tissue of the animals. The prepared beetroot powder was filled in the purchased gelatine capsule. About 3g of beetroot powder was filled in the capsule using gloves in a closed and sterilized area. The weight of each the capsule was about 5g. It was then preserved in a polyethylene zip cover and sealed for further analysis. From the Table it is clear that phytoconstituents such as alkaloids, carbohydrates, flavonoids, tannins and terpenoids are actively present in the prepared capsule. The colour which is the measure of the concentration is measured calorimetrically. As a result the beetroot sample appeared red in colour and using the obtained calorimetric value the observed value of the sample was determined to be 6.28 mg of Iron.

Index Terms – Gelatin, phytoconstituents, beet root capsule.

I. INTRODUCTION

The word capsule derived from the Latin Capsula, meaning a small box. In Pharmacy, the word is used to describe an edible package made from gelatin or other suitable material which is filled with medicines to produce unit dosage, mainly for oral use. They are unit dosage forms in which one usual dose of the drug has been accurately placed. Capsule shell contains two parts: cap and body. Body is larger than the cap. Capsules are solid dosage forms in which drug substances are enclosed within a hard or soft soluble shell generally formed from gelatin. Capsules may be classified as either hard or soft depending on the nature of the capsule shell. The capsule shells of both hard and soft capsule are made up of gelatin blends and may contain excipients [1].

Gelatin possesses five basic properties that make it suitable for the manufacture of capsules: It is nontoxic, widely used in foodstuffs, and is acceptable for use worldwide. It is readily soluble in biological fluids at body temperature. It is a good film forming material producing a strong flexible film. Gelatin is a substance of natural origin that does not occur as such in nature. Gelatin is a heterogeneous product derived by hydrolytic extraction of animal collagen, a natural protein, which occurs in the skin, bones and connective tissue of the animals. There are two main types of gelatin i.e. Type A and type B [2] Type A gelatin is derived from an acid precursor and exhibits an isoelectric pH 9, whereas type B gelatin is from an alkali-treated precursor and has its isoelectric pH 4.7. The acid process takes about 7 to 10 days and is used mainly for porcine skins because they require less pre-treatment than bones [3].

The properties of gelatin that are most important to capsule manufacturers are the bloom strength and viscosity. The bloom strength is a measure of gel rigidity. It is determined by preparing a standard gel (6.66% w/v) and maturing it at 100°C. It is defined as the load in grams required pushing a standard plunger 4mm into the gel. The gelatin used in hard capsule manufacture is of a higher bloom strength (200-250 g) than that used for soft capsules (150 g) because a more rigid film is required for the manufacturing process [4].

II. RESEARCH METHODOLOGY

Sample collection:

A concentrated solution of gelatin is prepared by dissolving the gelatin in demineralized water which has been heated to 60–70°C in jacketed pressure vessels. The solution contains (30 – 40% w/w) of gelatin and is highly viscous, which causes bubbles as a result of air entrapment. To remove the air bubbles, a vacuum is applied to the solution and processing aid such as sodium lauryl sulfate, is added to reduce surface tension. Dip-coating the gelatin solution on to metal pins (moulds). The temperature is maintained at about 50°C in a jacketed heating pan. Rotation of the dip-coated pins following adsorption of the gelatin solution on to the surface of the pins. Drying of the gelatin-coated pins once the gelatin is evenly distributed on the mould, a blast of cool air is used to set the gelatin on the mould.

Preparation of beetroot powder:

The beetroot vegetable was collected from the local market in Coimbatore and was washed, peeled and grated. Using a grater, grate the peeled beets in desired size and shape. Place them on a tray and cover with parchment paper. Place the grated beetroot in the hot air oven at desired temperature (100°C) for 4-5 hours until they become completely dry without any moisture content. Once the beetroots are completely dried, use a mixer to grind them to make it a powder. Sieve the powdered mixture, and store it in an air tight container.

Production of beetroot capsule:

The prepared beetroot powder was filled in the purchased gelatine capsule. About 3g of beetroot powder was filled in the capsule using gloves in a closed and sterilized area. The weight of each the capsule was about 5g. It was then preserved in a polyethylene zip cover and sealed for further analysis.

III. RESULTS AND DISCUSSION

The results obtained from studies on beetroot detox capsules underscore their potential as a natural dietary supplement for promoting overall health and well-being. By facilitating detoxification, helps in reducing diabetics, supporting liver function, enhancing metabolic processes, and conferring cardiovascular benefits, beetroot detox capsules offer a multifaceted approach to health maintenance [5]

Furthermore, the versatility and convenience of encapsulated beetroot supplements make them an accessible option for individuals seeking to incorporate the health-promoting properties of beetroot into their daily regimen. However, further research is warranted to elucidate the long-term effects and optimal dosing strategies of beetroot detox capsules, as well as their potential interactions with medications or existing health conditions [6].

IV. Table 1: Qualitative Analysis of Beetroot detox capsules

S. No	Phytoconstituents	Analysis
1.	Test for Alkaloids: a). Hager's Test b). Wagener's Test	(-) (+)
2.	Test for Carbohydrates: a). Benedict's Test b). Molisch's Test	(+) (-)
3.	Test for Flavonoids: a). Lead Acetate Test b). Ferric Chloride Test	(-) (+)
4.	Test for Tannins: a). Lead Acetate Test b). Ferric Chloride Test	(-) (+)
5.	Test for Terpenoids	(+)

Key (+) = present and (-) absent

From the Table it is clear that phytoconstituents such as alkaloids, carbohydrates, flavonoids, tannins and terpenoids are actively present in the prepared capsule.

Quantitative estimation of iron:

The prepared capsule is oxidised with ignition or oxidation .iron as ferric iron reacts with ammonium thiocyanate or with potassium thiocyanate to give ferric thiocyanate which is red in colour [7]. The colour which is the measure of the concentration is measured calorimetrically. As a result the beetroot sample appeared red in colour and using the obtained calorimetric value the observed value of the sample was determined to be 6.28 mg of Iron.

V. CONCLUSION

The conclusion for a detox capsule utilizing beetroot as a key ingredient would emphasize its potential benefits and effectiveness in promoting detoxification and overall health. Beetroot, with its rich concentration of antioxidants, vitamins, and minerals, offers a natural and potent solution for detoxification. Through its detoxifying properties, beetroot can aid in eliminating toxins from the body, supporting liver function, and enhancing overall well-being. The inclusion of beetroot in a detox capsule formulation provides a convenient and efficient way to incorporate its benefits into one's daily routine. By harnessing the power of beetroot in a convenient capsule form, individuals can easily integrate this superfood into their wellness regimen, paving the way for improved vitality and vitality [8].

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