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DEVELOPMENT AND EVALUATION OF BUCCAL DOSAGE FORMS OF *GARCINIA CAMBOGIA*

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ABSTRACT

Medicated jelly formulations are more suitable for pediatric, geriatric and dysphagic patients, which offer rapid dissolution and absorption of drugs thereby early onset of action. The aim of study was to develop and evaluate oral jelly formulation of *Garcinia cambogia* extract using pectin as the natural gelling agent. The primary objective was formulation of unit moulded jelly containing herbal medicaments and also to optimize the dosage form that will have extra beneficiary for hepatoprotective and weight-loss supplement effect without any side effects. The crude extract or constituents from the plant also exerted hypolipidemic, antidiabetic, anti-inflammatory, anticancer, anthelmintic, anticholinesterase and hepatoprotective activities. All the formulations exhibited good physiochemical properties and found to be stable.

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INTRODUCTION:

Many therapeutic agents are absorbed in the oral cavity. For the drugs having significant buccal absorption, dosage forms such as Medicated Jelly and Chewing Gums permit more rapid therapeutic action as compared to oral dosage forms. Medicated Jelly has been very well received by the parents for their use in children with full dentition. Children in particular may consider chewing gum as a more preferred method of drug administration compared with oral liquids and tablets. These are used for medication, lubrication and some miscellaneous applications [1-3]. Studies on the fruit rind of Garcinia gummi-gutta, commonly known as *Garcinia cambogia* (syn.), have shown that the extracts as well as (−) hydroxycitric acid (HCA), a main organic acid component of fruit rind, exhibited anti-obesity activity including reduced food intake and body fat gain by regulating the serotonin levels related to satiety, increased fat oxidation and decreased de novo lipogenesis [5]. HCA is a potent inhibitor of adenosine triphosphate-citrate lyase, a catalyst for the conversion process of citrate to acetyl-coenzyme A, which plays a key role in fatty acid, cholesterol and triglycerides syntheses.

MATERIALS AND METHODS:

Materials

The fruit rind of *Garcinia cambogia* was obtained from the evergreen forests of Western Ghats, from Konkan southwards to Travancore and authenticated. Pectin was purchased from Loba Chem. Mumbai, India. Citric acid was purchased from Seva Fine Chemicals, Ahmedabad. All the other chemicals used were of analytical grade.

Preparation of *Garcinia cambogia* extract

The extraction was done by Soxhlet extraction method. After 24 hours, the solvents were distilled off, the extract was concentrated on water bath and collected.

Preparation of oral jelly

All the ingredients were weight and added to syrup. Pectin was added with constant stirring followed by propylene glycol and citric acid. Scum was removed and sodium benzoate was added and mixed. Herbal drug extracts were weight accurately, dissolved in water, added, transferred to moulds and allowed to cool and settle. Garcinia cambogia extract with betacyclodextrin was prepared by triturating for 1 hr, and then concentrated & free flowing drug powder was obtained. Then it was subjected to same above procedure. After the jelly was set, it was wrapped in to the butter paper and stored in dry place.

Evaluation parameters for formulation

Appearance

The prepared jelly was inspected visually for clarity, colour and presence of any particle.

pH

The pH of all the jelly was determined using digital pH meter. 0.5 g of the weighed formulation was dispersed in 50 ml of distilled water and the pH noted.

Determination of viscosity

Viscosity of the jelly was carried out by using (LV) Brookfield viscometer (Dial type).

The viscosity was calculated by following relation:

Viscosity in centipoises = Dial reading × Factor

Stability Studies

Stability study was conducted as per ICH (International Conference on Harmonization) guidelines at room temperature (25±2 °C, 60±5% RH) and accelerated temperature condition (40±2°C, 75±5% RH) for one month.

Table 1: Formulation batches of different jelly products

Ingredients	F1 (%w/w)	F2 (%w/w)	F3 (%w/w)	F4 (%w/w)	F5 (%w/w)	F6 (%w/w)	F7 (%w/w)	F8 (%w/w)
Pectin	2%	2%	2.5%	3%	3%	3%	3%	3%
Citric acid	1%	1%	1%	1%	1%	1%	1%	1%
Sugar syrup	60	60%	67	67	67%	70	80	90
Propylene glycol	3%	3%	3%	3%	3%	3%	3%	3%
Sodium benzoate	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
G.Cambogia extract	1%	1%	1%	1%	1%	1%	1%	1%

RESULTS:

Table 2: Evaluation parameters for formulation

Formulations	Appearance	pH	Viscosity (cps)
F1	Transparent	3.5	640000
F2	Syrupy	3.8	600000
F3	Opaque	3.4	588000
F4	Opaque	3.6	580000
F5	Opaque	3.5	624000
F6	Transparent	3.2	590000
F7	Transparent (Sugar crystallization)	3.4	552000
F8	Transparent (Sugar crystallization)	3.3	604000

All the eight batches of prepared jelly were subjected to the evaluation for the appearance, pH, and viscosity.

Table 3: Stability of the optimized formulation (f6)

Days	Appearance	Viscosity	pH	Stiffness	Sugar crystallization
Room Temperature					
15	Transparent	585000	3.40	Yes	No
30	Transparent	568300	3.95	Yes	No
Accelerated Temperature					
15	Transparent	495000	3.30	Yes	No
30	Transparent	413600	3.20	Yes	No

As per stability data of the jelly, F6 formulation was found to be stable at room temperature. It became very sticky when kept at accelerated temperature, but even at the accelerated temperature if it is kept in covered or enclosed condition; there was no or little change in consistency.

CONCLUSIONS:

The present study demonstrates the herbal extracts of *Garcinia cambogia* were successfully formulated in the jelly formulations. In formulation development, taste masking of bitter herbal drugs was a big challenge and that was solved by making complex with betacyclodextrin. All drugs extracts, which are used in the dose range are safe for consumption and can be swallowed without any risk of systemic side effects.

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