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Research Article

Formulation and Evaluation of Herbal Chocolate: Chocogil

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ABSTRACT

Giloy is the ayurvedic formulation. Commonly term as guduchi satva, this magical powder hails immense health benefits towards pitta, aggravating disorders like indigestion, constipation, burning sensation of hands and feet, fever, gout, fatigue, jaundice, diabetes, COVID-19 etc also work as immunity booster. Our present study in this review encompasses the formulation and evaluation of Herbal Chocolate made by Giloy using HPTLC and taste masking methods.

INTRODUCTION

Giloy (*tinospora cordifolia*) is a climbing shrub and essential herb in ayurvedic medicine. All parts of these plant are thought to have health benefits. Chemical constituents of Giloy are glycosides, alkaloids, aliphatic compounds, steroids, carbohydrates, etc people have long used it to treat a wide range of issues, including fever, infections, diarrhoea and diabetes, gout, fatigue, liver problems. Giloy is the ayurvedic formulation. It is considered an essential herbal plant in ayurvedic and folk medicine, all parts of the plant are used in ayurvedic medicine. however, the stem is thought to have the most beneficial compound. ayurvedic pharmacopeia of India has approved the plant's stem for use in medicine. recently the discovery of active components from the plant and their biological function in disease control has led to active interest in the plant across the globe. Our present study in this review encompasses to mask the bitterness of Giloy.[(1)]

It's a big, deciduous climbing vine that spreads widely and has many long, twining branches. Simple, alternating, and exstipulate leaves with long, roundish, pulvinate petioles that can reach a maximum length of 15 cm (6 in). The basal petiole is longer than the apical one, and it is partially and completely twisted. Its reddish fruit and heart-shaped leaves give rise to the name heart-leaved moonseed. Broadly elliptical or ovate cordate, lamina measure 10–20 cm (4–8 in) in length or 8–15 cm (3–6 in) in width. At the base, they are profoundly cordate and have seven nerves. They are membranous, pubescent above, and have

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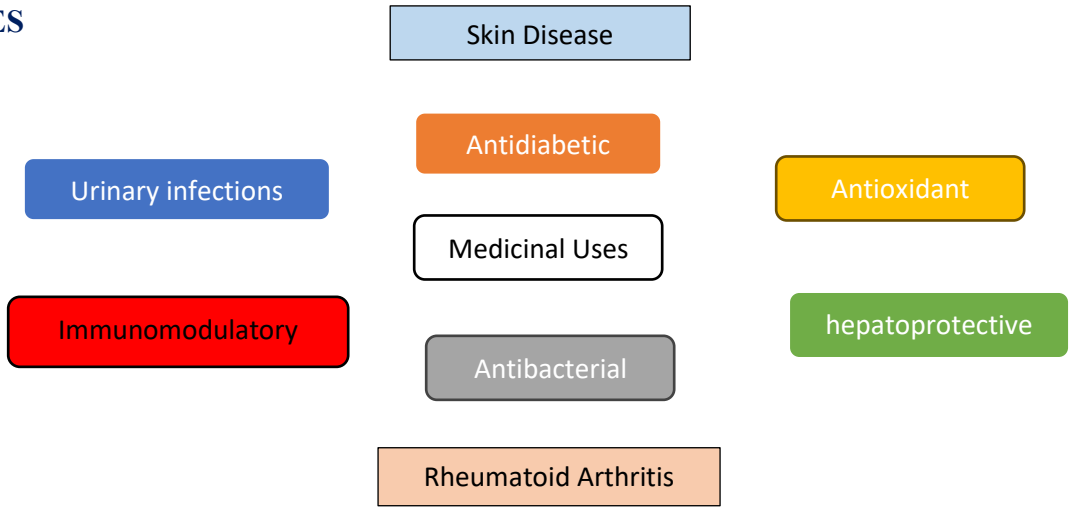
whitish tomentose with a noticeable reticulum underneath. Small, greenish-yellow, unisexual flowers on distinct plants that develop when the plant has no leaves are seen on the axillary and terminal racemes.[2,3]

Fig. Parts of *tinospora cordifolia.*

USES



MATERIALS AND METHODS

Materials:

1. Milk chocolate compound,
2. White chocolate compound and
3. Dark chocolate compound.
4. Giloy satva (extraction),
5. Giloy churna (dry powder of stem)
6. HPMC
7. Sodium saccharin

Dosage:

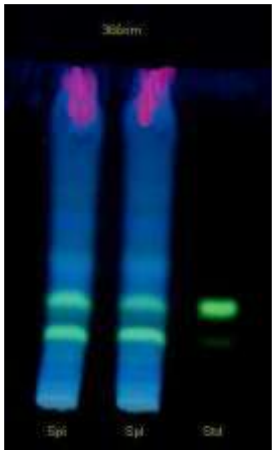
- Child – 20mg/day
- Adult – 100mg/day

Method I:

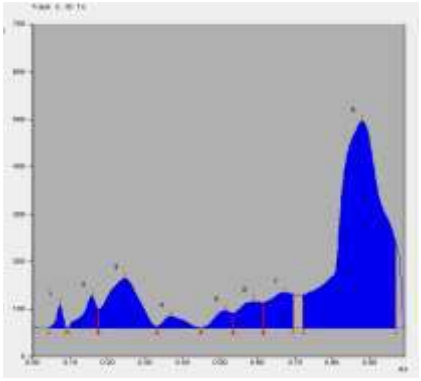
Drug Content determination:

Drug content of herbal chocolate was determined by High Pressure Thin Layer Chromatography. Here, control was taken as aqueous giloy extract and test as melted chocolate sample. HPTLC plates were prepared by using silica G and plates were activated for ½ Hr. Spotting was carried out on both plates i.e., control and test plate by using capillary. Run both the plates in mobile phase i.e., Toluene: Ethyl acetate: Water having ratio 7:3:2. After running of both plates air drying of plates

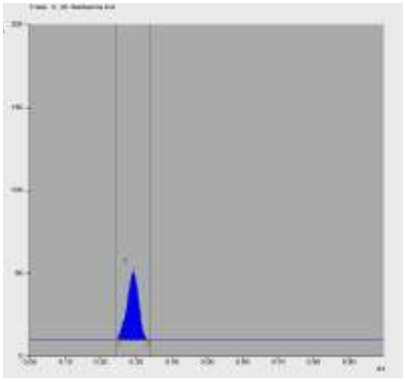
was carried out. Further, visualization of both plates was carried out by using iodine chamber. By comparing the RF value of both the plates i.e., control and test, Drug content in Medicated chocolate was determined.



HPTLC Spectra



Standard



Test

Fig. HPTLC spectra of *Tinospora cordifolia* stem powder

Application

10µl of methanol extract of *Tinospora cordifolia* stem powder and 10µl berberine Standard were applied as bond of 0.2mm width.

Mobile phase- Butanol: ethyl acetate: acetic acid: water

(3:5:1:1) (V/V/V/V).

Saturation time - The chamber was saturated with mobile phase for 30 – 40min.

Migration distance - 8 cm.

Lamp- Deuterium

Wavelength of detection – 366 nm.

Method II:

Taste masking for bitterness of Giloy was done in four different age groups including Children, adults, diabetic patients.

FORMULATIONS

- For Churan:

1. Child – 10mg churan + 5gm milk chocolate + Sodium saccharin + HPMC
2. Adult – 50mg churan + 10gm milk chocolate + Sodium saccharin + HPMC

   Taste masking method is used.
3. Diabetic – 50mg churan + 10gm dark chocolate + HPMC

   Taste masking method is used.

- For Satva:

3. Adult – 50mg satva + 10gm white chocolate + Sodium saccharin + HPMC

Fig. Methodology of making Chocolate of *T. cordifolia*

EVALUATION PARAMETERS

1) Physical appearance

- Colour - Dark Brown / White
- Odour - Chocolate with no brunt, no smoky smell
- Taste - Sweet
- Texture - Smooth and even

2) Phytochemical evaluation

Sr. No.	Phytochemical constituents	Aqueous extract
1	**Tannins**	-
2	**Alkaloids**	+
3	**Saponins**	+
4	**Phenols**	+
5	**Flavonoids**	+
6	**Cardiac glycosides**	+
7	**Carbohydrate**	+
8	**Protein**	+
9	**Steroids**	+

Table No. 1: Phytochemical evaluation of T. cordifolia (-) indicates absent and (+) indicates present.

Chemical constituents of ***T. cordifolia* (*Guduchi*)**

Type of chemical	Active principles	Part in which present
Alkaloids (*Tikta*-Bitter Principle)	Berberine, Palmatine,	Stem
	Tembetarine, Magnofl orine, Choline, Tinosporin, Isocolumbin, Palmatine, Tetrahydropalmatine, Magnofl orine	Root
Glycosides	18-norclerodane glucoside, Furanoid diterpene glucoside, Tinocordiside, Tinocordifolioside, Cordioside, Cordifolioside A, Cordifolioside B, Syringin, Syringin-apiosylglycoside, Palmatosides C, Palmatosides F, Cordifoliside A, Cordiofoliside B, Cordifoliside C, Cordifoliside D, Cordifoliside E	Stem
Diterpenoid lactones	Furanolactone, Clerodane derivatives and [(5R,10R)-4R-8R-dihydroxy-2S-3R:15,16- diepoxy-cleroda-13 (16), 14-dieno-17,12S:	Whole plant

	18,1S-dilactone] and Tinosporon, Tinosporides, and, Jateorine, Columbin	
Steroids	β -sitosterol, δ-sitosterol, 20 β-	Aerial part
	Hydroxy ecdysone. Ecdysterone, Makisterone A, Giloinsterol.	Stem
Sesquiterpenoid	Tinocordifolin.	Stem
Aliphatic compound	Octacosanol, Heptacosanol,	Whole plant
Miscellaneous	Nonacosan-15-one	Whole plant
	3,(α,4-di hydroxy-3-methoxy-benzyl)-4-(4-	Root
	Compounds hydroxy-3-methoxy-benzyl)-tetrahydrofuran. Jatrorrhizine. Tinosporidine, Cordifol, Cordifelone, N-trans-feruloyl tyramine as diacetate, Giloin, Giloinin, Tinosporic acid	Whole plant

Table No. 2: List of chemical constituents present in T. cordifolia.(4,5)

3) Physical stability

To check the physical stability, sample of chocolate was kept in closed container for 1 month at 28° After one month interval, Test sample of chocolate was observed for physical appearance and drug degradation.

4) Evaluation for taste masking:

Table 1:

Sr. No	Name	Product 1	Product 2	Product 3	Product 4
1	Children	-	-	-	-
2	Adults	-	-	-	-
3	Anti-Diabetic	-	-	-	-

Table 2:

1	2	3	4	5
No Bitter 100%	**Mild Bitter** 80%	**Moderate Bitter** 60%	**Partial** 40%	**Bitter** 20%

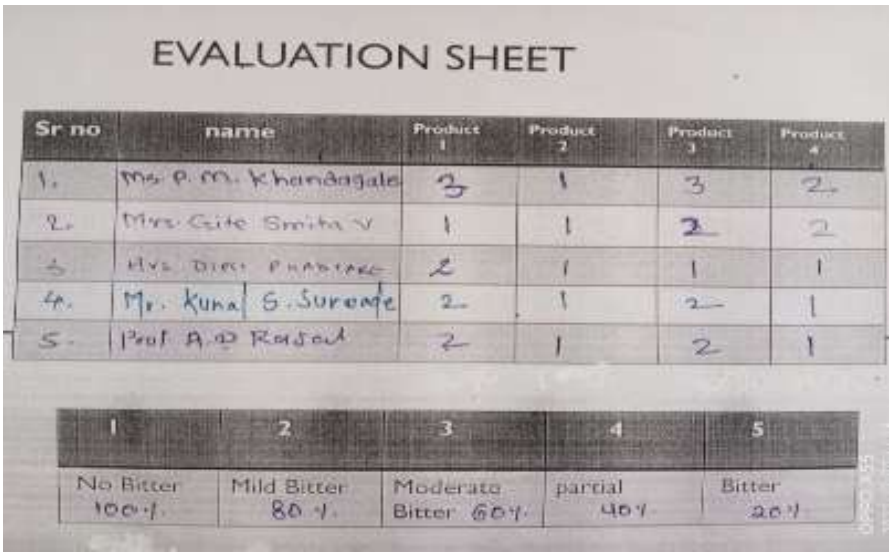


Fig. Evaluation sheet for Survey

Fig. Final formulation with packing

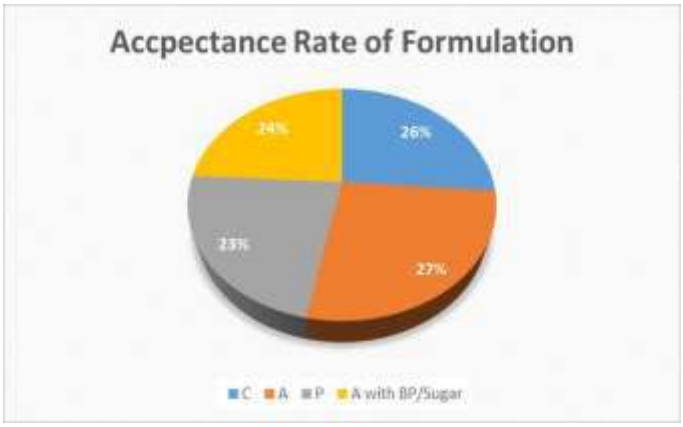


Fig. Pie chart for acceptance rate of formulation

RESULTS AND DISCUSSION

Giloy has bitter taste so that children, adults generally do not like to consume it. Present study covers the bitterness of Giloy in chocolate formulation with the help of taste masking. It is evaluated, this study succeeded to cover the bitterness of Giloy.

Qualitative testing by HPTLC method is ensuring the presence of Giloy extract in herbal chocolate.

CONCLUSION

In the present study, formulation and evaluation of Herbal Chocolate was carried out. Aqueous extract of Giloy was prepared and phytochemical analysis was carried out to check the presence of desired compounds that shows the acceptable results. By using prepared extract herbal chocolate prepared and evaluated for drug content determination, physical appearance, bitterness, and physical stability. From above study, we concluded that the successful masking of bitterness associated with Giloy. The herbal chocolate provides smooth and creamy texture to the formulation. Also, good oral drug delivery system to gives therapeutic effect. Choco Gil is the immuno-booster chocolate in which bitterness is masked. Qualitative testing by HPTLC method is ensuring the presence of *Tinospora cordifolia* extract.

MARKETED FORMULATIONS Amrtarishta, Churna, Taila, Kwatha, Sattva, Giloy papaya tulsi juice, Giloy tea, Giloy drop, Giloy stick powder, Giloy syrup, Giloy ras, Guduchi satv powder, etc

NOVELTY AND FUTURE SCOPE To mask the test of natural Giloy which is harshly bitter and to formulate a chocolate of it which is easily acceptable by all age groups? This will be a desirable dosage form for not only children's but also adults. The dosage form can be used as an ideal delivery agent in many other similar bitter drugs.

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