

# HERBAL NUTRITIONAL CHOCOLATE

Author : *Rajeshwari Bandu Tungar.*

Author Affiliation : *PRESS College of pharmacy for ( womens)Chincholi,Sinner, Nashik.*

## 1. Abstract:

*The essential arget of this study was formulate and evaluate nutritious chacolote containing herbal ingredient that will provide maltinutritions and will have work on nutritional deficiencien."Tht berbal chcolate formulation is widcly used to boosts immane yem s an oxidant and teating mood disorders. The dark chcolate is majorlybeneficialin cardiovsseular dinesaseland other benefits. Far bheformulation of" herbal chcolatethe extract of moringa and giloy are used which areinich in/nutrients. The drug extractwhich are used in the dose range are safeconsumption and and\_can can te he\_kwhllowed without any risk of side-effect. The-medicated ehcololote formulation is widclysystem i aind increases the patientGused lo immune compliance. Chcolate formulation serves as favorable for masking the taste and anpleasant flavor of majority of the active ingredients and mparts the smoorty. siky. And the composion of were evaluated active ingredients. creamy texture The prepared chcolate formulation for general appearance, PH, hardness and stability testing.*

*Keywords: Chcolate. antioxidant, immune system, paticnt complian*

## 2. Introduction:

2.1 Nutrition is the biochemical and physiological process by which an organism uses food to support its life. It provide nutrients which can be ecreate energy and chemicat structures. Failure to obtain sufficient nutrients causesmalnutrition. Nutrients deficiency or diseases can be result of poor nutritional intake, chronic health condition, acute health condition, medication, altcred nutrients metabolism, E combination of this factorean impact the level of both macronutrients\_ and\_ micronutrients in the body. They can lead to alteration in energy metabolism, immune function. cognitive function, bone formation, and muscle function, as well as growth and development if the deficieny is present during fetal development and carly childhood. Macronutrients deficiencies include deficiencies in protein, fat and calories and can be lead to stunting. pronouncedwasting or disproportionality large abdomen, marasmus\_in disease of severe wasting due to prolonged inadequate intake of protein, carbohydrate andfat. Kwashiorkor is disease that results from a prolonged inadequate intake of protein.essential fatty acid defencies, which would include dry scadly rash, decreased growth in infants and children. lowered immune response and impaired wound healing, Micronutrients deficiencies would inelude deficiencies in vitamins and mineral in the body. According to national health and nutrition examination survey(NHANES) data, the most common nutrients deficiencies from 2003-2006 in

2.2the general united states population were vitamin B6,iron,vitamin D , calcium, vitamin C and vitamin B12. The formulated herbal chcolate containing the moringa and giloy are rich in minerals like calcium, potassium, and ironand copper. Vitamins like beta-carotene of vit A, vit 1B, vit C, D, E which help to reduce the deficiency and fulfill the body nutrient. Dark chcolate used in it have many benefits used as antioxidant, help to reduce the blood pressure and balance certain hormones in the body. This formulated herbal chcolate fulfills body need and preventfrom several diseases.

Table 1 : Information about vitamin

nutrient	function	Sign and symptom of deficiency
Vitamin A	Involved in immune function, vision, cell growth	Night blindness and xerophthalmia
Vitamin B6	Involved in greater than 100 enzyme reaction in the body and involved in protein metabolism	Microcytic anemia, scaling of the lips and corners of the mouth, swollen tongue, depression, and confusion.
Vitamin B12	Involved in red blood cell formation, neurological function, and DNA synthesis.	Megaloblastic anemia, fatigue, weakness, constipation, loss of appetite, and weight loss.
Vitamin D	Promotes calcium absorption and proper bone formation involved in cell growth, immune function, and	Development of rickets in children or osteomalacia in adult, and fatigue.

	reduce inflammation.	
iron	A component of hemoglobin and therefore important in the transfer of oxygen from lungs to organs, and involved in synthesis of hormones as well as normal growth and development.	Microcytic, hypochromic anemia: impaired cognitive function, poor body temperature regulation, depressed immune function and spoon like shape of nails.
Calcium	Involved in muscle function, nerve transmission and proper bone formation	Development of osteoporosis
magnesium	Involved in more than 300 enzyme reaction, protein synthesis, muscle function, nerve function, blood sugar control and blood pressure control.	Loss of appetite, fatigue, weakness, nausea, vomiting, numbness, muscle cramps, seizures, personality changes and abnormal heart rhythms

## 2. Chocolate:

It is a complex and adaptable food that may be combined to create a wide range of taste and consistency sensations. Chocolate is an anhydrous medium for water-sensitive active agent that is resistant to microbial growth and hydrolysis. In many ways, chocolate is an excellent vehicle for delivering active agent. The organoleptic characteristic of chocolate, for example are suitable for mask unpalatable flavors associated with some active agents and delivering a smooth and creamy texture to otherwise unappealingly abrasive active agent formation. Saturated fat, polyphenols, sterols, di and triterpenes, aliphatic alcohol and methylxanthines are all prevalent in chocolate. Chocolate main constituent is cocoa, which is high in polyphenols, especially flavan-3-ols like epicatechins, catechins, and procyanides. A high intake of dietary flavonoids a subgroup of polyphenols may reduce the risk of coronary heart disease, according to research. Antioxidant protects cells from free radical damage produced by biological function like breathing and external impurities like cigarette smoke. Free radical cause damage to our bodies' when we don't eat enough antioxidant increased Oxidation, for example, might cause plaque to form on the artery wall due to low density lipoproteins, generally known as bad cholesterol. However chocolate has multiple benefits such as a rapid initiation of action ease of manufacture and scale reduced drug dose, and increased drug loading capacity.

## 3. Moringa:

Obtained from leaves of *moringa oleifera*. The leaves of *m.oleifera* are rich in minerals like calcium, potassium, iron, copper. Vitamins like beta-carotene of vit A, vit C, vit D and vit E also present in *m.oleifera*. Moringa provide 7 times more vitamin C than orange, 10 times more vitamin A than milk, 25 times more iron than spinach, 15 times more potassium than bananas. Phytochemicals such as tannins, sterols, terpenoids, flavonoids, saponins, anthraquinones, alkaloids and reducing sugar present along with anti cancerous agent like glucosinolates, isothiocyanates, glycosides compounds and glycerol-1- octadecanate.

Table 2. The nutrient composition of  
leave:

Sr no.	Nutrient	M.oleifera powder
1.	Calories	205kcal
2.	Protein	27.1 gm
3.	Carbohydrate	38.2 gm
4.	Vitamin B1	2.64
5.	Vitamin B2	20.5
6.	Vitamin B3	8.2
7.	calcium	113
8.	Vitamin c	17.3mg
9.	Phosphorus	368
10.	iron	0.57mg
11.	Copper	324

**4. Giloy:**

It is consist of dried, matured pieces of stem of tinospora cordifolia miers belongs to family menispermaceae. Medicinal uses of giloy:

- Boosts immunity
- Reduce stress and anxiety
- Treat chronic fever
- Reduces sign of aging
- Improve digestion
- Control blood sugar level Nutritional composition of giloy stem powder:

Sr.no	nutrient	Giloy stem powder
1.	Calories	88.64kcal
2.	Proteins	2.30 g
3.	Carbohydrate	3.34 g
4.	Fiber	11.3 g
5.	Vit C	56mg
6.	Calcium	85.24 mg
7.	iron	5.87mg

Stevia leaves powder: Stevia powder derived from the leaves of the plant species stevia rebaudiana. Benefits of stevia:

- Add sweetness without adding calories
- Helps in weight loss journey
- Manage high blood pressure
- Manage blood glucose level

**6. Need and Objective:**

Nutrients are as substance required by the body for survival, growth and reproduction. Nutrition is related to improve infant, child, and maternal health, stronger immune system, safer pregnancy and child birth, and lower risk of non-communicable disease. It is important to have a balanced diet reach in all nutrients to ensure that no deficiencies and hormonal imbalance are created in the body.

Basic causes of nutritional deficiency include:

- a) Inadequate intake
- b) Inadequate absorption
- c) An increased requirement of nutrients.

Multinutrients play an essential role in improving the body immune system it helps to fight against several diseases. Every organism on the earth needs nutrients. Due to our changes in day to day lifestyle one cannot fulfill the nutrients requirement. This gives us energy and allows our bodies to perform their essential function. To fulfill the day to day requirement of body. Provide the multinutrients, multivitamin and minerals

#### 7.OBJECTIVE:

Objective of this study is to formulate chocolate which fulfill the body nutritional requirement.

- a) To improve the immune function of a person
- b) To improve vitamin and mineral levels
- c) To increase overall health and well being
- d) To provide iron supplement during pregnancy
- e) To provide antioxidant supplement like vitamin C and vitamin E



**8. Material:**

- a) Moringa leaves powder
- b) Giloy stem powder
- c) Stevia powder
- d) Dark chocolate
- e) Sodium benzoate

Sr.no	Name of ingredient	Role	Quantity taken
1.	Moringa leaves powder	Nutritional supplement	250 mg
2.	Giloy stem powder	Nutritional supplement	150 mg
3.	Dark chocolate	Taste masking, nutritional	1.5 gm
4.	Stevia powder	Sweetener	500 mg
5.	Sodium benzoate	Preservative	5-6 mg

**Method:****8.1 :Preparation of chocolate formulation**

- All the ingredients are were weight accurately
- In one beaker dark chocolate has melted properly into this moringa leaves powder and giloy stem powder added.
- Stir it for 3-4 min allows it to melt completely to get fine consistency.
- To provide the sweetness to the chocolate add stevia powder in it as a sweetener.
- Add sodium benzoate as a preservative in it.
- Then the prepared chocolate containing herbal drug extract was poured in molds and kept in freeze to set it.
- Pack it properly and store it in cool and dry place

## 8.2 :PH of chocolate formulation:

The ph of chocolate formulation was checked using ph meter it is found to be 7.2

## 8.3 : Physcal stability:

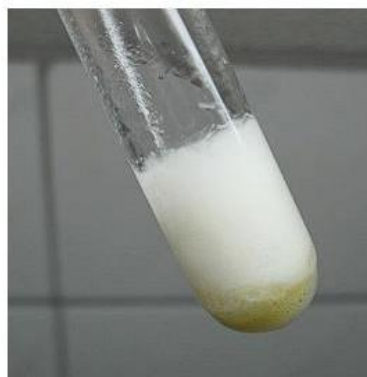
The formulation and preparation of any product is incomplete without proper stability studies of the prepared product. To check the physical stability sample of chocolate was kept in closed container for 1 month at 28 °C afterone month interval, test sample of chocolate was observed for physical appearance and drug degradation.

Table no 4: Test

Sr.no	test	observation	inference
1.	<b>Dragendroff test:</b> Add 1ml of dragendroff reagent to 2ml extract	Brownish red color	Alkaloid present
2.	<b>Ferric chloride:</b> Few drops of 10% ferric chloride add 2ml of extract	Greenish black color	Tannins present
3.	<b>Fehling's test:</b> To 2 ml of sample add Fehling solution A and Fehling's solution B	Brick red color	Carbohydrates present
4.	<b>Salkowski test:</b> 5ml extract add 2ml chloroform and 3ml con.sulphuric acid	Reddish brown color observed	Terpenoids present
5.	<b>Frothing test:</b> 0.5 gm. of extract is dissolve in water and shake vigoursly	Formation of foam	Saponins present
6.	<b>Biuret test:</b> In 2ml of extract add 2 ml of biuret reagent	Purple color	Protein present
7.	<b>Killer killiani test:</b> Dissolve drug extract in ferric sulphate solution in 5% of glacial acetic acid. add 1drop con h <sub>2</sub> so <sub>4</sub>	Blue color observed	Glycoside present



Ferric chloride test of tannin



Foam test for saponin



Fehling test for carbohydrate



Keller Killiani test for glycoside

Table no 5: Phytochemical analysis of giloy stem powder :



Sr.no	test	observation	inference
1.	Wagner test	Reddish brown color	Alkaloid present
2.	Biuret test	Purple color	Proteins present
3.	Salkowski test	Reddish brown color	Terpenoids present
4.	Foam test	Foam formed	Saponin present
5.	Ferric chloride test	Greenish black color observed	Tannin present
6.	Fehling test	Brick red color observed	Carbohydrate present



Biuret test for proteins



Fehling test for carbohydrate

**9. Sensory evaluation:**

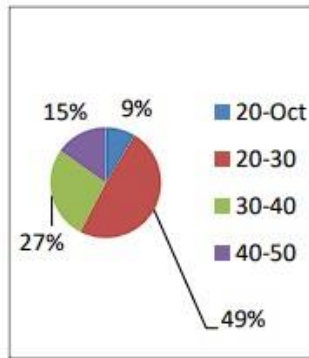
The prepared chocolate were evaluated by all age group for sensory characteristics.

Parameter	Tester					Total score	Average score
	1	2	3	4	20		
Appearance	5	4	5	5	4	92	4.6
Taste/flavour	4	5	4	3	4	90	4.5
Smell/odour	5	4	5	5	4	93	4.6
Texture	4	3	4	5	4	89	4.4
Mouth feel	5	5	4	4	5	94	4.7
Sweetness	4	4	3	4	4	91	4.5
Overall acceptability	5	5	4	4	5	95	4.7
Packaging	4	4	5	5	4	94	4.7

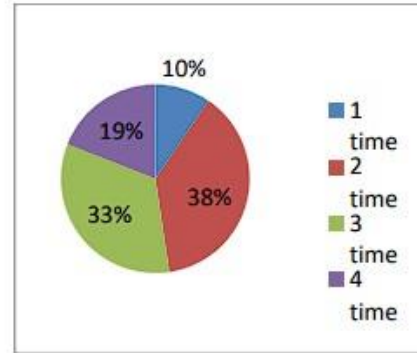


10:Result and discussion :

Age of consumer:



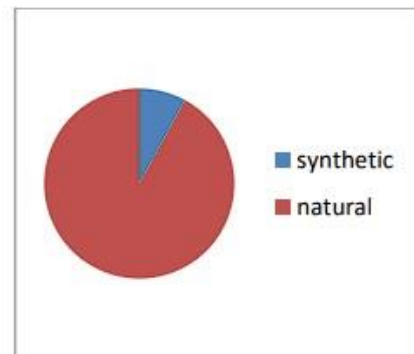
How many times you can consume this product



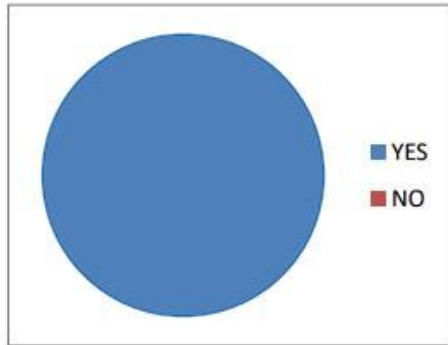
Would you buy this product



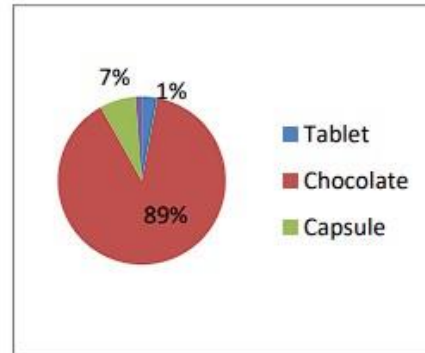
Which product would you prefer Natural or synthetic



Do you like the taste of chocolate



what would you prefer?



10.1 : Any suggestions for chocolate:

- Modify taste little bit
- Add some flavoring agent
- After taste little bitterness occu
- Use some other herbal ingredient with it

## 11:Summary and conclusion:

## Summary:

We have conducted a survey; according to survey we found that many people has suffering from malnutrition. Also we conduct market survey from that we found that there is not any specific chocolate preparation for malnutrition. The main aim of our project is to formulate a product which mask the bitter test of herbal drug as well as provide the multinutrients. That will work on nutritional deficiencies this widely used for boost the immune system as an antioxidant and also used in mood disorders. Chocolate is adaptable food that can be combined to create completely different taste and texture sensation. Our aim to increase the patient compliance. Our product is different from marketed preparation as our product show significant effect. It provide the all necessary vitamins, nutrients and minerals as well taste good.

## Conclusion:

We develop herbal chocolate having multinutritional property show significant effect. extract of moringa and giloy was prepared and phytochemical analysis was carried out to check the presence of desired compounds that shows the acceptable result. By using prepared extract medicated chocolate prepared and evaluated for general appearance, dimension and physical stability. From above study we can conclude that the chocolate provides smooth and creamy texture to the formulation and good for masking the unpleasant taste associated with some drugs. Also, good oral drug delivery system to gives therapeutic effect

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