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Preparation of Nutritive Food Supplement from leaf and Pods *Moringa oleifera* (lamm), *Tinospora cordifolia* ((Thunb) Miers) *and Cinnamomum verum* J. presl.

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ABSTRACT

Moringa oliefera is of unique plant which are more nutritious in nature. It is commonly known of drumstick due to their fruit structure. This plant has nutritive value more for that purpose ancient that is used as vegetable. Understanding benefit of that we have prepare moringa food supplement. First, we have to take healthy plant material select from the field dry them into fine course powder Them add preservative After sometime add some amount of cinnamon *(Cinnamomum verum)* for taste purpose then add sweeting agent such Gulvel (*Tinospora cordifolia*). Mixing the all content of food supplement. After that we have to testing will be done first of all Nutritive parameter are calculate such as carbohydrate, protein, lipid and ascorbic acid. Then later all phytochemical screening will be done then finally used as moringa food supplement

Keywords: Moringa food supplement, Biochemical parameter, Phytochemical screening

INTRODUCTION

Moringa oleifera is a small to medium-sized, evergreen or deciduous tree native to northern India, Pakistan and Nepal. It was cultivated and occur in naturally in the native region .The is belongs from the family Moringaceae The Moringaceae is a single-genus family (Lalas and Tsaknis,2002). It is angiopermic plant which grows up to 10-12 m in height with green colour leaf this plant shows zygomorphic white flower which produce c pod type of fruit the fruit having a structure like a drum stick hence it also called as Drum stick tree .This having a value for the edible fruit ,leaves, flower root and seed and also used as traditional medicine in most of native places (Parrotta, 2004).It is a type of local medicinal Indian herb which has turn out to be familiar in the tropical and subtropical countries. The other terms used for Moringa are Horseradish tree, Mulangay, Mlonge, Benzolive, Drumstick tree, Sajna, Kelor, Saijihan and Marango. Moringa oleifera division to become from Kingdom: Plantae, Division: Magnoliphyta, Class:

Magnoliopsida, Order: Brassicales, Family: Moringaceae, Genus: Moringa, Species: *M. oleifera* (Fahey, 2005). There different investigation has done on the chemical composition of Moringa oleifera leaves. The percentage of protein 11.9%, moisture content shows 73.9%, fat is 1.1%and carbohydrate are 10.6%. There are some nutritive elements are also present in the dry matter per 100 g are Calcium was estimated 847.1 mg/gm Magnesium151.3 mg/gm , Potassium 549.6 mg/gm, Iron 17.5 mg/gm, Zinc 1.3 mg/gm and Phosphor 111.5 mg/gm. (Yaméogo *et al.,* 2011) In fact, the nutritional properties of Moringa are now so well known that there seems to be little doubt of the substantial health benefit to be realized by consumption of Moringa leaf powder in situations where starvation is imminent. Nonetheless, the outcomes of well controlled and well documented clinical studies are still clearly of great value Moringa (Moringa oleifera Lam) (Fahey, 2005). The Moringa oleifera tree consider as multipurpose tree they feature that used as multiple medicine the root, leaves and flower is used as traditional medicine for the treatment of diarrhea and hypertension it also used as folk medicine in most of countries (Anwar *et al.*,2007). From the many of centuries in many cultures of the world the use of moringa to treat several diseases such asthma, blackhead, blood impurities, bronchitis chest paining, malnutrition cholera and many other illness (Mahmood et al. 2010). Moringa is thought to have the potential of providing vital nutrition as well as health and wellbeing to consumers. In this work, fresh Moringa leaves juice extract was envisaged as a good vehicle of spreading its nutraceutical benefits. (Quarcoo, 2008). *M. oleifera* is rich in proteins, vitamin A, minerals, essential amino acids, antioxidants, and flavonoids, as well as isothiocyanates. The extracts from *M. oleifera* exhibit multiple nutraceutical or pharmacological functions including anti-inflammatory, antioxidant, anti-cancer, hepatoprotective, neuroprotective, hypoglycemic, and blood lipid-reducing functions. The beneficial functions of *M. oleifera* are strongly associated with its phytochemicals such as flavonoids or isothiocyanates with bioactivity (Kou *et al*., 2018) Cinnamon has been used as a spice and as traditional herbal medicine for centuries. It was suggesting that cinnamon has anti-inflammatory, antimicrobial, antioxidant, antitumor, cardiovascular, cholesterol-lowering, and immunomo-dulatory effects. Furthermore, animal studies have demonstrated strong hypoglycemic properties. The use of cinnamon as a used to the treatment of diabetes (Gruenwald, 2010). *Cinnamomum verum* stem bark aqueous extract against food-borne pathogen bacteria, nosocomial infection bacteria and normal flora. Extraction with an aqueous system from the dried stem barks of *C. verum* yielded 2.5% of the dried plant. *C. verum* stem bark aqueous extract showed interesting inhibitory effect on the growth of *S. epidermidis*, *K. pneumoniae* and *E. coli* at low minimum concentration. This may give additional information of antimicrobial activity of *C. verum* stem bark aqueous extract. (Puangpronpitag and Sittiwet, 2009). *T. cordifolia* in countering various disorders and usages as anti-oxidant, anti-hyperglycemic, antihyperlipidemic, hepatoprotec-tive, cardiovascular protective, neuroprotective, osteo-protective, radioprotective, anti-anxiety, adaptogenic agent, analgesic, anti-inflammatory, antipyretic, a thrombolytic agent, anti-diarrheal, anti-ulcer, anti-microbial and anti-cancer agent. The plant is also a source of micronutrients viz. copper, calcium, phosphorus, iron, zinc and manganese. A special focus has been made on its health benefits in treating endocrine and metabolic disorders and its potential as an immune booster. Several patents have been filed and granted to inventions encompassing T. cordifolia as a major component of therapeutics for ameliorating metabolic, endocrinal and several other ailments, aiding in the betterment of human life expectancy (Dhama, *et al.,* 2016).

MATERIAL METHODS

Sample Collection:

Moringa oleifera leaf and pods ,*Tinospora cordifolia* stem , *Cinnamomum verum* stem are collected from market of rahata that material are observed and inspect carefully all foreign material are discarded and plant material washed with tap water clean the sample and dry in the oven at 60 ^{0} c make the drying the material course into fine powder with help of mortal and pestle then sieved it and stored air tight container

Method:

Preparation of food supplement:
Selection of Material from local market.
Identification of material with taxonomic literature.
Washing of material with tap water.

Removal of the debris and unwanted material in our sample.
Drying of plant material by natural and artificial that is sun drying and artificial by oven drying.
After drying that are crushed into mortar and pestle into fine powder.
Then sieve it and stored in air tight container.
Then fine powder of plant material is to mixed together as proportion 5:2:1.
And make final mixture of food supplement.

Nutritional parameter of Food supplement

Moisture Content:

Moisture is nothing but moisture is present in the mixture. The moisture content was measured by standard protocol of weight determination method (Bell and Labuza, 2000). Two-gram sample was placed in a preheated and weighed glass petriplate and then dried in a hot air oven at 130 °C for 2 hrs or till constt. Weight after drying glass petriplate was transferred to the dessicator to cool and then petriplate was reweighed. The loss in weight was calculated as percentage of moisture content.

$$Moisture\ content\ (\%) = \frac{W1 - W2}{Weight\ of\ Sample}\ X\ 100$$

W1 = Weight (g) of Sample before drying.
W2 = Weight (g) of Sample after drying

Ash content:

The analysis of **ash** content in foods **is** simply the burning away of organic content, leaving inorganic minerals The ash content was determine by the standard method (Bell and Labuza 2000).Two gram sample was placed in a preweighed crucible and then uncovered crucible was allowed to incinerate in a muffle furnace at 820 °C for 4 hours and then crucible was cooled in a desiccator and then weighed.

$$Ash\ (\%) = \frac{Weight\ of\ ash}{Weight\ of\ Sample}\ X\ 100$$

Mineral composition:

A naturally occurring, inorganic, solid, crystalline substance which has a fixed structure and a chemical composition Inductively coupled plasma optical emission spectrometry (ICP-OES), is an analytical technique used for the detection of trace metals. It is a type of emission spectroscopy that uses the inductively coupled plasma to produce excited atoms and ions that emit electromagnetic radiation at wavelengths characteristic of a particular element. It is a flame technique with a flame temperature in a range from 6000 to 10000 K. It is also a solution technique and standard silicate dissolution method are employed (Stefansson *et al.,* 2007). The intensity of this emission is indicative of the concentration of the element within the sample.

Carbohydrate:

The carbohydrate is estimated by DNSA method using standard protocol (Rajbhar *et al.*2015). The concentrations of reducing sugars and nonreducing sugars were determined by the dinitro salicylic acid method We can estimate sugar content and it is discussed in detail in result section

Protien:

Macro method was used for the estimation of crude protein content Grind 2g of sample food supplement sample and dry powder in a pestle and mortar with 10ml of distilled water and centrifuge 4000rpm for 10mins. Then 1ml of supernatant was made up to 100ml with distilled water. The amount of protein was estimated by the method of Lowry *et al.*using BSA as the standard (Ikawa *et al.,* 2003).

Lipid:

The lipid confirmatory test is determined by lipid spot test that is determined by physical test (AOAC. 1999). In which we take dry paper do not wet them it gives spot of fruit extract from conclude C.T. of lipid and detailed discuss in result and conclusion Taken a 1gm powdered sample and add to it 4 ml chloroform. Dissolve all samples properly. Then spot the mixture in whatsmann filter paper no. 41 by using dropper. Identified the lipids present in the sample

Ascorbic acid:

The Ascorbic acid estimation method that is by volumetric analysis the ascorbic acid content in these fruits and vegetables were determined by volumetric method (Ahmed *et al.,* 2016)

Phytochemical analysis

Test for secondary metabolite:

1. ***Steriods:***

1ml extract dissolve in 10 ml chloroform and equal volume of concentrated sulphuric acid was added by sides of the test tube. The upper layer turns red and sulphuric acid layered showed yellow with green fluoresence. This indicated the presence of steriods.

2. Tarpenoids:

2 ml of extract was added to 2 ml of acetic anhydride and concentration of H2SO4 formation of blue green rings indicate the presence of tarpenoids.

3. Tannins:

2 ml extract was added to few drops of 10%ferric chloride.A yellowish precipitate indicated the presence of tannins.

4. ***Saponins:***

5ml extract was mixed with 20 ml D.W. and then agitated into graduated cylinder for 15 min formation of foam indicates the presence of saponins.

5. Alkaloid:

Take 2 drop of extract treated with few drops of Wagners reagent. The reddish brown precipitate is observed.

6. ***Phlobatanin:***

1 ml extract was boil in 2ml 1% aq. Hcl. Red colour indicates presence of phlobatanin.

7. ***Quinine:***

1 ml extract was mixed with 1ml conc H2SO4.Red colour indicates presence of quinone.

8. Glycosides:

2 ml extract was mixed with 3 ml of chloroform and 1ml 10%NH3 solution was added. Pink colour indicates presence of glycosides.

9. ***Flavonoids:***

3ml of 1%NH4Cl solution was added to 5ml of extract. Yellowcolour indicates the presence of flavonoids.

10. ***Phenolic compound:***

The 2ml extract is treated with 2ml water and 10% aq. Fecl3 solution. The blue or green colouration observe.

RESULTS & DISCUSSION

Nutritional analysis

Moisture content and ash content is important for the nutritional analysis ,It is very important factor which directly and indirectly effect on the nutrition of food the Nutritional analysis of moisture content was determine by table 1 moisture and as content of mixture that's tell that two garam of sample contained 8.9%while ash contained are 7.3

% per two gram of sample was reported. The mineral is composition is reported by the method of Inductive Coupled Plasma Optical Emission Spectrometer (ICPOES).that are reported in Table no 2 Estimation of mineral composition of mixture the reports tell that the calcium more amount is present that is 2003 ppm, iron having a concentration of 30 ppm, mangnese having content 150 ppm, magnesium 350 ppm, nickel 400 ppm, phosphorous 1000ppm, zinc having 150 ppm. The Carbohydrate analysis of mixture was done by DNSA method and calculated and represent as each 100 mg of mixture contained 38% *M. oleifera* leaves, crude protein was 20.51%, crude fiber 19.25%, crude fat 2.63%, ash content 5.13%, moisture content 71.73%, carbohydrate content 43.78% (Sharma *et al.,* 2012).

The protein analysis of food supplement done by lowery method is calculated 100mg sample contained 18.40 % are present. The food supplement contained vitamin c (ascorbic acid). The ascorbic acid estimation is carried out by standard protocol with the help of that ascorbic acid analysis are done. The Ascorbic acid present is calculated by the specific protocol. The 1gm of food supplement comprised 45.6mg are present. The lipid analysis is carried out of by standard method lipids spot test in which following are lipid spot when food supplement sample are tested that shows lipid spot on Whatman filter paper. Food supplement shows presence of secondary metabolite which are shown by Table 3.

Table 1: Nutritive analysis of food supplement

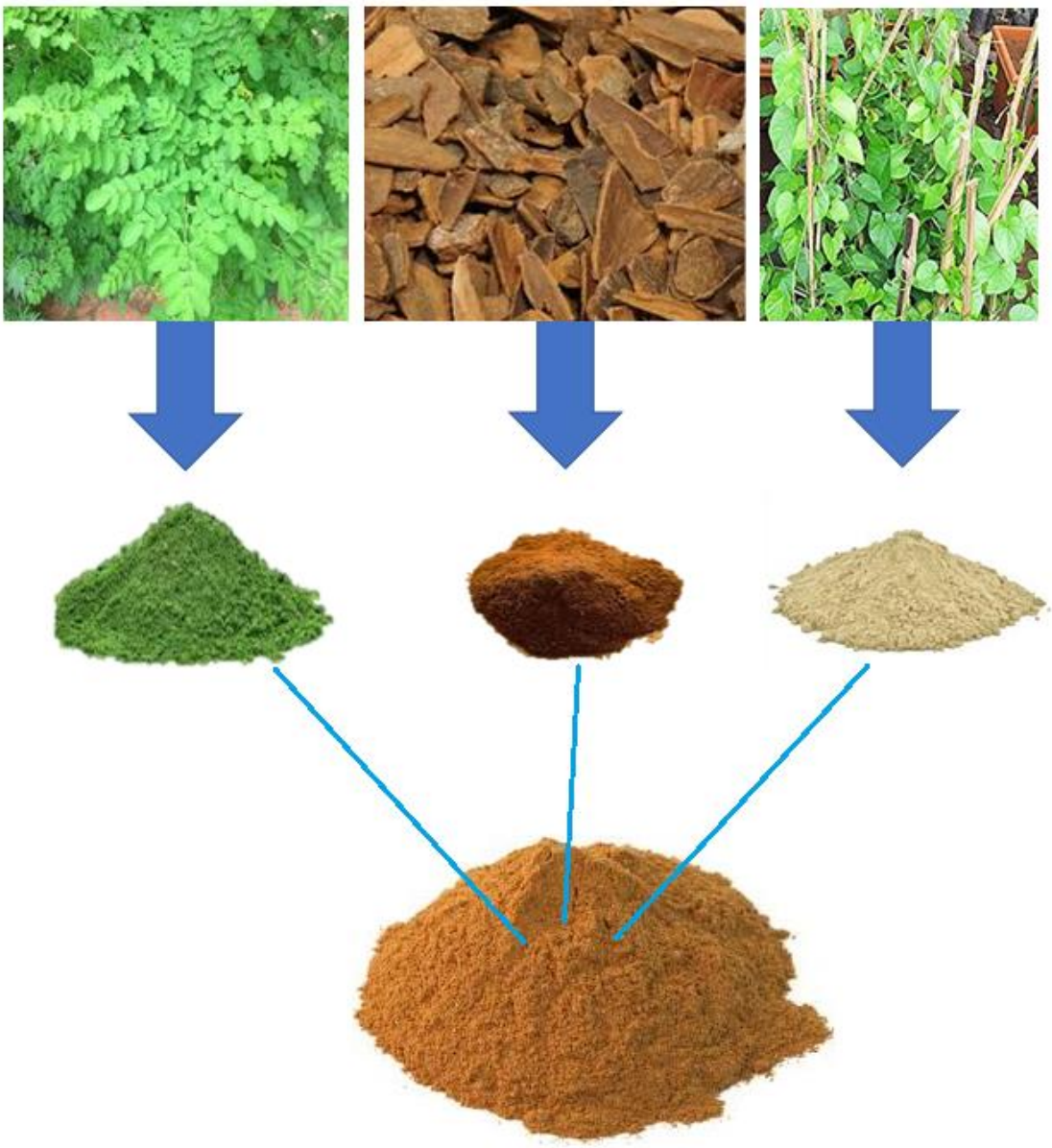
Sr. No.	Nutritive parameter	Content
1	Moisture Content	8.9%
2	Ash content	7.3%
3	Carbohydrate	38%
4	Protien	18.40%
5	Ascorbic acid	45.6 mg

Table 2: Mineral composition of food supplement

Sr. No.	Mineral	Concentration (PPM)
1	Ca	2003
2	Fe	30
3	Mn	150
4	Mg	350
5	Ni	400
6	P	1000
7	Sr	0.6
8	Zn	150

Table 3: Phytochemical analysis of food supplement

Sr. No.	Secondory metabolite	Test
1	Steriods	-
2	Tarpenoids	++
3	Tannins	++
4	Saponins	+
5	Alkaloid	++
6	Phlobatanin:	+
7	Quinin	-
8	Glycosides	+
9	Flavonoid	++
10	Phenolic compound	+++



Figures 1: Entire process of Preparation of food supplement

Phytochemical analysis of food supplement they show presence of terpenoid, saponin alkaloid, tannin, glycoside, flavonoids are present in our supplement. The Moringa oleifera shows presence of the flavonoids, tannins, steroid, alkaloid and saponins (Patel *et al.,* 2014). The seed and leaf of Moringa oleifera contained a number of phytochemicals such as alkaloids, glycerides, flavonoids, steroids, terpenoids, saponins and tannins (Akinyeye *et al.,* 2014) There are some report of on the phytochemical analysis on the *Tinospora cordifolia* chemical constituents reported different classes such as alkaloids, diterpenoid lactones, glycosides, steroids, sesquiterpenoid, phenolics, aliphatic compounds and polysaccharides. (Singh *et al.* 2003)

Application

This moringa food supplement is used to prevent inflammation in body the food supplement prevent cancer This food supplement made by using the different plant source hence it used improved immunity It is important for the improvement mental health it is good for brain It is help to solved problem related kidney due to high calcium level in it .it is rich in calcium so it will helps in the improve the health bone It helps in reducing the symptoms of diabetes It prevents the respiratory problem solving by improving immunity It helps in reduces the blood sugar increased the mental health proper nutrition This food supplement helps wound healing capacity it helps in proper digestion in

the body due to low level of carbohydrate and high level of vitamin c.it is very important nutrition in pregnant women with little amount of supplement gate more nutrition which improves the health of newborns this food supplement avoid making ageing in the face user because nutritive immunity building supplement .It will helps in the enhance the skin color and function.

CONCLUSION

The overall result of nutritional analysis and phytochemical analysis shows by the food supplement that the mixture of *Moringa oleifera, Tinospora cordifolia, Cinnamonum verum* showing that plant The mixture of this plant shows the excellence performance which can be we consider as best nutraceutical and can be used as flavoring agent which shows the number of benefit to health This food supplement has equal to range of protein two yoghurts to gate energy In equality of vitamin per gram shows nutrition equal to two carrot having vitamin . Then equality of potassium per gram nutrition you need three bananas the most of improvement in the per gram is qual calcium four glass milk then only gate that level of calcium. then vitamin C when we six orange then per gram nutritional level of a vitamin c It is totally herbal food supplement .it can be used in the different sources of food If the user take this supplement in regularly then it is helpful in the increase health status of user. The most important this food supplement shows the nutritive component available of different sources. There is no much cost require for the production. Food supplement prepare from three different plant that having medicinal values that used in different diseases treatment

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