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Ready to drink soup : Moringa oleifera (Moringa leaves) with Curcuma longa (Turmeric)

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1. Abstract:

Utilization of natural products of plant origin has gained popularity over the years. There is immense scope for natural products that can intimate health benefits beyond traditional nutrients. Natural plant products have been used throughout human history for various purposes. Having co-evolved with animal life, many of the plants from which these natural products are derived are billions of years old. Tens of thousands of these products are produced as secondary metabolites by higher plants as a natural defence mechanism against disease and infection.*Moringa oleifera* is one such tree having tremendous nutritional and medicinal benefits. It is rich in macro- and micronutrients and other bioactive compounds which are important for normal functioning of the body and prevention of certain diseases. Leaves, flowers, seeds, and almost all parts of this tree are edible and have immense therapeutic properties including anti-diabetic, anticancer, antimicrobial, and antioxidant. Most of the recent studies suggested that Moringa should be used as a functional ingredient in food. it is known as the miracle tree because of its diversified beneficial features, e.g., 10 times more vitamins than carrots, 7 times more vitamin C than oranges, 17 times more calcium than milk, and 15 times more potassium than bananas . In addition, it helps to increase the blood antioxidant level and reduce the blood sugar level *M. oleifera* is the most widely known and utilized of these.similarly

Turmeric is a plant that has a very long history of medicinal use, dating back nearly 4000 years. In Southeast Asia, turmeric is used not only as a principal spice but also as a component in religious ceremonies. Because of its brilliant yellow colour, turmeric is also known as "Indian saffron." Modern medicine has begun to recognize its importance, as indicated by the over 3000 publications dealing with turmeric that came out within the last 25 years.

2. INTRODUCTION

2.1 Moringa-Turmeric:

Soup is a primary liquid food, generally served warm or hot. Instant soup is almost ready to eat and take less time to prepare. It has an important role for maintain nutrition of the people by covering wide range of dried foods. There is a big demand of instant soup mixes in the global market. There are millions of peoples who suffered from malnutrition in the world; Instant soup mix can be great source of nutrition for them. People are passing hectic life due to urbanization. They do not have enough time to cook foods and are becoming habituated to consume fast foods and something like that. Most of these foods are junk foods due to high sugar, fat, salt content, and low nutrient value in terms of protein, fibre, vitamin, and mineral content. Consumption of these nutrient-deficient foods ultimately leads to malnutrition and related diseases. Moreover, cereal- based dietary pattern may also exaggerate this condition. This problem could be overcome by supplying easy- to cook nutrient- enriched foods. The reason of choosing Moringa and turmeric as supplementary ingredients is their nutritional content which makes them a complete nutritional source for regular diet.

This powerful duo blended together to offer the best in super foods. Research shows they **controls blood sugar, Cholesterol, they are an immune booster, manage high blood pressure and Arthritis**.It's Anti-inflammatory suppress cancercells, Anti- Fungal, Anti-

bacterial, a memory booster and more.

The leaves of *M. oleifera* are rich in minerals like calcium, potassium, zinc, magnesium, iron and copper. Vitamins like beta-carotene of vitamin A, vitamin B such as folicacid, pyridoxine and nicotinic acid, vitaminC D and E also present in *M.oleifera*. Phytochemicals suchas tannins, sterols, terpenoids, flavonoi ds,saponins, anthraquinones, alkaloid s and reducing sugar present along with anti-cancerous agents like glucosinolates, isothiocyanates, g lycosidecompounds and glycerol-1-9-octadecanoate . Moringa leaves also have a low calorific value and can be used in the diet of the obese. Moringa (Moringa oleifera) belongs to the family Moringaceae. It is multipurpose tree widely distributed in Bangladesh, India, Pakistan, Sri Lanka, grows in tropical and subtropical region of the world. Moringa can withstand both severe drought and mild frost conditions. It is medium size tree about 10m high, the stem is normally straight that reaches a height about 1.5-2m, the extended branches grow in a disorganized manner. Moringa leaves are feathery with green to dark green elliptical leaflets 1-2cm. the fruits are trilobed capsule, green in colour and lenghthwise 30-120cm long and 1.8cm wide. Moringa a storehouse of important nutrients and antinutrients. Moringa leaves contain protein (31.64%), Carbohydrates (38-60.75%), Fat (6.95%), Moisture (4.5%), Ash (9.29%), Fiber (11.37%). It also contain mineral like Iron (28mg/100gm), Magnesium (368mg), Phosphorous (204mg). Moringa oleifera leaves are rich source of α-tocopherol (17.3mg/100gm), carotenoids (44.30-80.48mg/100gm). It also contains βcarotene,luteoxanthin,glucosinolate. Flavonoids such as flavanol glycosides (glucosides, rutinosides, mononylglucosides, kaempferol (0.05-0.67%), quercetin (0.07-1.26%)

Curcuma longa L. is a perennial rhizomatous herb which grows up to one metre in height. It is the most utilized species of the genus Curcuma andfamily Zingiberac eae. There are approximately 100

species in the genus, of which around 40 are of Indian origin. The Latin word “Curcuma” is derived from the Arabic word “Kourkoum”, which means saffron. It grows in hot, humid conditions and requires plenty of water. It has a short pseudostem and large oblong leaves. The underground rhizome has a primary or mother rhizome, with multiple branching secondary rhizomes. They are ovate, oblong, or pyriform and have a pale yellow, reddish yellow or orange brown colour. It has pale yellow flowers and does not bear fruits. It is cultivated in India, China, Indonesia, Thailand, and other tropical regions including Africa. “Madras” and “Alleppey” turmeric are the two main commercial types of turmeric in India, based on the area of production. Alleppey turmeric is imported by the United States as a food colourant and spice, whereas the British and Middle Eastern markets prefer Madras turmeric which has lower curcumin and volatile oils. Madras turmeric has a brighter lighter yellow colour that is suitable for mustard paste and curry powder/paste. The “Bengal” type is predominantly used as a dye.Turmeric has been put to use as a foodstuff, cosmetic, and medicine. It is widely used as a spice in South Asian and Middle Eastern cooking.

3. Materials and methods:

3.1 Required Materials

s.no	Name of the ingredients
1	Moringa leaves
2	Turmeric rhizome
3	Other herbs and spices

3.2 Procurement of Raw Material:

Raw materials required for the preparation of soup have been procured from the organic food material supplierafter complete verification and analysis. The procured raw materials are Moringa leaf, turmeric and other herbs and spices. These materials are washed dried and processed to flakes and the quantity and quality analysis have been done

3.3 Nutritive value of Moringa leaf

Table – 1: Proximate composition of dehydrated Moringa leaf (per100gleafflakes)

Nutrient	Freshleaves	Sundriedsample%	Shadowdriedsample%	Ovendriedsample%
Moisture(%)	75.9	6	6	6
Energy(kcal)	92	268.56(65.74)	271.83(66.15)	271.54(66.12)
Protein(g)	6.7	23.42(71.39)	23.66(71.68)	23.78(71.82)
Carbohydrate	12.5	27.98(55.33)	28.476(56.10)	28.323(55.86)
Fat(g)	1.7	6.987(75.66)	7.032(75.81)	7.014(75.76)
Fiber(g)	0.9	11.3(92.04)	12.1(92.56)	11.8(92.37)

Table2Proximatecompositionofdehydrated*Moringa*leaf(per100g)

Nutrient	Freshleaves	Sundriedsample%	Shadowdriedsample%	Ovendriedsample%
Iron(mg)	0.85	21(95.95)	24(96.45)	19(95.52)
Calcium(mg)	440	3382(87.44)	3405(82.88)	3467(82.06)
Phosphorus(mg)	70	203(65.51)	218(67.89)	215(67.44)

Table 3 Chemical Composition ofTurmeric

s.no	Component	Standard value
1	Protein	3.18±0.38
2	Lipids	1.62±0.23
3	Ash	2.12±0.18
4	Crude fibre	2.94±0.29
5	Moisture	11.41± 0.15

4. Processing of raw materials

4.1 Sorting

Fresh Moringa oleifera leaves were bought from the vendor in the village over inspection and testing. Fresh, green, un-damaged, non - insect infested leaves are selected. Bruised, discoloured, decayed and wilted leaves were discarded before washing the leaves, as decayed and wilted leaves give a bad flavour to the whole batch. Besides decayed and wilted, leaves can also lead to loss of nutrients too. For turmeric we have selected the matured and well grown rhizome. Shrinked and decayed rhizomes are discarded as they will rot the other rhizomes alsowe made sure that our products are free from pesticides and chemical fertilizer before we purchase

4.2 Washing

The stalks of the leaves were cut from the main branches and the leaves were washed thoroughly three to four times with plenty of water to remove all the adhering dust, dirt

particles. After washing the stems of the leaves were tied together in small bunches and was hung in an airy space to drain away extra water and to air - dry the leaves. The residual moisture was evaporated at a room temperature, before the actual drying process on a clean paper with constant turning over to avert fungal growth. After air drying, all the stems and branches of the leaves were removed and only the leaves were used for drying. Similarly for turmeric we have washed the rhizome with tap water for thrice to remove all the adhering dust, dirt particles. Then we have peeled the outer skin and kept for shadow drying we have followed the same procedure for other herbs and spices

4.3 Shadow drying:

The air - dried leaves and rhizome were spread on cotton sheets and was kept in the room. The room selected for shadow drying of our raw products was well ventilated. Natural current of air was used for shadow. It took about six days for the leaves to dry completely and become crisp and brittle to touch during the drying process of turmeric we constantly turned over to rhizome to avert fungal growth

4.4 Flakes:

After drying, the leaves, turmeric rhizome and other herbs and spices were made into flakes by using mixer and stored in air tight container

4.5 Blending:

The blender machine is cleaned washed and allowed it to dry completely. Once the machine is dried we have transferred the processed ingredients into the blender.We have blended all the ingredients for about 30 minutes so that all the ingredients mix up well

4.6 Packing

After blending is completed, we have packed Moringa leaf flakes along with turmeric and other spice in the dip bag made of wheat jute materials.

5. Result

We have prepared the standard composition and gave for tasting and the results are mentioned below:

Characteristics	1	2	3	4	5	6	7
Taste	Good	Nice	Nice	Nice	Nice	Good	Nice
Odour	Pleasant Turmeric smell	Pleasant Turmeric smell	Mixed smell of herbs with turmeric	Mixed smell of herbs with turmeric	Herbs smell	Pleasant turmeric smell	Pleasant Turmeric smell
Appearance	Greenish yellow	Greenish yellow	Greenish yellow	Greenish yellow	Greenish yellow	Yellow	Greenish yellow
Mouth feel	Nice	Soothing	Soothing	Soothing	Good	Pleasant	Soothing
Overall acceptability	9/10	8/10	9/10	9/10	9/10	9/10	8/10

6.**Conclusion:**

According to our study, the results illustrate that, consuming Moringa leaf along with turmeric soup is good for health. Leaves can be given to infants and growing children and serve as a good tonic. However, it may be difficult for children to eat them naturally, as they are bitter. But we removed the bitterness of leaves by adding some spices and herbs. So, it is notdifficult for children to drink the soup. Consuming of these leaves soup daily is highly nutritious. Because generally the drumstick leaves are the most nutritious part of the plant, being a significant source of vitamin B6, vitamin C, pro vitamin A as beta-carotene, magnesium and protein

Drumstick leaves are more effective for growing. Kids in providing minerals for the minerals for strong bones and teeth iron is also present in high value which can be a great dietary supplement for anemic patients. This underutilized plant could further be justified as mothers best friend plant best friend plant to combat the associated problems of under developed and developing countries. Similarly turmeric has the ability to **aid digestion and detox properties** make turmeric a superfood for weight loss too. Turmeric's anti-inflammatory properties also help in relieving symptoms associated with both rheumatoid arthritis and osteoarthritis. The umpteen antioxidants present

in turmeric can help curb the free radical activity.The findings of the present study concluded that Moringa oleifera Soup is effective inimproving the hemoglobin level among antenatal mothers. It is also a simple, safe, cost effective and non-pharmacological method which could be easily preparedanybody at home and it does not cause any side effects. Hence, the Moringa oleifera and curcuma longa soup administration can be incorporated as an effective method in management of anemia and add on nutritive supplementation among Antenatal Mothers. This may be promoted in the community as a prophylactic and dietary Supplementation for anemiaTurmeric soup is beneficial to the cancer patients with regards to its anti-cancer activity due to the presence of curcumin content.

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