Journal of Pharmacognosy and Phytochemistry
Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; Sp 9(3): 114-119
Received: 07-04-2020
Accepted: 10-05-2020

Prerna Mitra
Department of Food Technology, School of Applied and Life Sciences (SALS) Uttaranchal University Prem Nagar Dehradun, Uttarakhand, India

Shilpa Sharma
Department of Food Technology, School of Applied and Life Sciences (SALS) Uttaranchal University Prem Nagar Dehradun, Uttarakhand, India

Corresponding Author:
Prerna Mitra
Department of Food Technology, School of Applied and Life Sciences (SALS) Uttaranchal University Prem Nagar Dehradun, Uttarakhand, India

Development of *Mung Dal* based instant soup mix fortified with *Moringa*: A review

Prerna Mitra and Shilpa Sharma

Abstract
As the population increasing competition is also increasing and for maintaining this status people stay away from home for the purpose of study and employment, so the demand of Ready to Eat, Ready to Cook and Ready to serve foods is also rising day by day. Between all this, instant soup powders have gained the attraction of the consumers due to its ease in preparation. The present study was carried out with the objective to develop an instant soup mix from *Mung Dal* Powder, *Moringa* Leaves powder, Onion powder, Garlic powder, Ginger Powder, and Spice powder mix with other ingredients. The prepared product samples were evaluated for sensory evaluation quality and shelf life. Due to the dehydration and drying process it contains less moisture hence can be stored for more time than usually homemade soups. It gives us an idea about how much *Mung Dal* Powder, *Moringa* leaves powder and other ingredients can be incorporated to get the best soup mix of desired health benefits and without compromising on taste and odour. Preparation of the soup mix is so easy that it can be termed as comfort healthy soup mix.

Keywords: Ready to eat, ready to cook, ready to serve, instant soup, *mung dal* powder, *moringa* leaves powder, shelf life

Introduction
Food processing industries holds astonishing growth and famous as sunrise sector. It acts as a major drive for economic progression of the country. The utilization of food has been completely changed since decade and novel technologies have been used and there are various formulations of instant and ready to serve foods. Food technology has made convenience foods possible and easy to cook by introducing instant food products. Nutritional rich beneficial and convenience foods formulation will have definite uprising and fulfils the market demands. Some foods that comes under the category of instant food products are, Canned foods, convenience foods, frozen foods, dried foods, preserved foods, etc. Soup is the very quick form of cuisine. Human beings are consuming soup for so long, it is apparently one of man's earliest foods, since it must have developed around the time that boiling was launched to be a mean of cooking food. Soup is generally prepared by cooking meat or vegetables in stock or hot/boiling water, until the flavour is extracted, forming a broth. In modern world commercially prepared instant soup (such as canned, dehydrated, and frozen soups) are replacing homemade soup as preparing soup at home is a time consuming process. Instant soup can become a second possible food for breakfast because it may be fulfil the adequacy of nutrients and energy requirement of the body. They are very easy to prepare and can serve instantly.

Instant Soup Mix
In present day's homemade soup is being substituted by industrially prepared instant soup powders as they take less time in preparation. Instant soup came under the category of Ready to Cook foods which are easy and simple to prepare. (BK Sarkar *et al*., 2019)
Instant soup is a vast group of dried foods, which perform a significant part in the nutrition of people as they need to fulfill the present and future consumer needs. Vegetable soup is a type of food containing high water. An easy way of preparing a soup is to use a base of soup in the form of flakes, granule and powder components aside from the burdensome way of removing the peel of vegetables, cutting, mincing, hot extraction, preparing with thickening agent, garnishing and decorating with condiments and herbs prior to serving. Soup is generally consumed as the starter or just before the main meal as it activates appetite and gives instant nourishment, which is primarily important for the enhancement of appetite and gastrointestinal responses.

Mung Bean

The *Mung* Bean came under the category of pulse and is related to the family of *Fabaceae.* It is round in shape and small in size and prepared in the same manner as other lentils. It can be eat up whole or as a split seeds and is widely consumed in Southern Europe and in Asian countries.

Between the local foods, products based on *mung* bean are widely consumed in India. *Mung* bean or green gram (*Vignaradiata*) is considered to be a native crop of India and has been cultivated in India since ancient times. *Mung* Bean contains high protein content compared to chick and has minimum anti-nutritional factors. There are different types of sweets, savoury and snacks products where *mung dal* is being used. Different *Mung* bean based products consumption rate is very high.

Botanical Illustration of Mung Dal

The *Mung* Bean (*Vignaradiata*) is the member of the legume family Fabaceae and known as green gram. *Mung* Bean originated in the plains of Peninsular India with its botanical origins, area of maximum genetic diversity and location of domestication being South India. The height of *Mung dal* is 25-100cm tall with trifoliate leaves and tiny fine brownish hairs on the stem branches. It is a deep rooted herb which produced annually. Planted in early June, the crop begins to flower in 50 to 60 days and continues for few weeks then after is ready to harvest in early to mid-September. When pods become fully matured it turns glabrous with 8-20 globose seeds per pod. Green gram is cultivated in several countries of Asia, Africa and the America. Altitudes of 0-1600m above sea level and under warm climatic conditions (28-30 ^{0}C) are the best conditions for the growth of *mung* bean. They are well adapted to red sandy loam soils and are drought tolerant giving reasonable yields with as little as 650 mm of yearly rainfall. Heavy rainfall results in increased vegetative growth with reduced pod setting and development. The most important part of *mung dal* is the seed used in several food products, both as whole seed and in processed form. They are also rich in protein just like another legume. The principal domestic use of *mung dal* is the production of dal sprouts which is seen commonly in Asian cooking and is used for *dals* and soups**.** (Kavya N. *et al.*, 2014) [7]

Nutritional value of Mung beans as a common food

Mung beans contains about 20-24% protein. The main storage proteins found in *mung* bean seeds are globulin and albumin which make up over 60% and 25% of the total *mung* bean protein, respectively. *Mung* bean protein is rich in essential amino acids, such as total aromatic amino acids, leucine, isoleucine, and valine, as compared with the FAO/WHO (1973) reference. Although, on pomparing with the reference pattern, *mung* bean protein is slightly deficient in threonine, total sulfur amino acids, lysine, and tryptophan. Moreover, the proteolytic breakdown of proteins during sprouting promote to a significant rise in the levels of amino acids.

Mung beans have much higher carbohydrate content than soybeans around 50–60%, and the predominant carbohydrate in the legume is starch. *Mung* beans have typically been used for the production of starchy noodles due to its high starch content, and also called *muk* in Korea. Oligosaccharides, such as raffinose, stachyose, and verbascose, in raw or imperfectly processed legumes are correlated with flatulence in the human diet. Due to these oligosaccharides which are present in *mung* beans, they are soluble in water and can be removed by proper pre-soaking, germination, or fermentation. *Mung* beans and sprouts provide less energy than that of other cereals, which is beneficial for people with obesity and diabetes. In inclusion, trypsin inhibitors, hemaglutinin, tannins, and phytic acid found in the *mung* bean have also been reported to have biological functions, eliminating toxins and promoting digestion. (Dongyan Tang *et al*., 2014) [5]

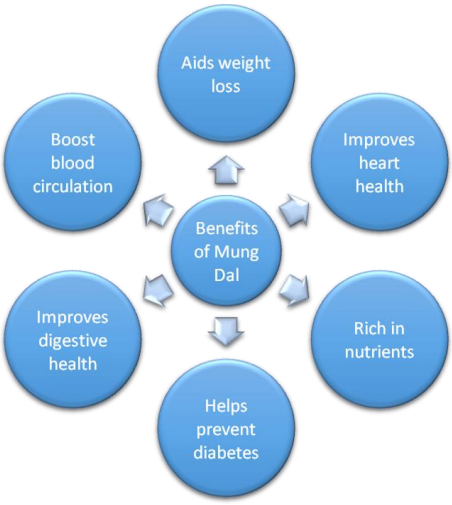
Table 1: Biological activities and compounds of *Mung* beans

Biological activities	Biological compounds
Antioxidant effects	Proteins, polypeptides, polysaccharides, polyphenols
Antimicrobial activity	Enzymes, peptides, polyphenols
Anti-inflammatory activity	Polyphenols
Antidiabetic effects	Polyphenols
Lipid metabolism accommodation	Phytosterols
Antihypertensive effects	Proteins, amino acids
Antitumor effects	Polyphenols, *mung* bean trypsin inhibitor fragments
Antisepsis effects	Polyphenols, aqueous extracts from *mung* bean coat

(Dongyan Tang *et al*., 2014) [5]

Mung Dal Benefits

Adding *mung dal* to your daily diet can have a range of health benefits, thanks largely to their high nutrient content. Here are some reasons for you to include these split pulses in your diet:



(Dongyan Tang *et al*., 2014) [5]

Fig 1: Benefits of Mung Dal

Moringa oleifera

Moringa oleifera is generally belongs to the region of Northern India, but currently it is widely distributed and found in the Americas, Africa, Europe, Oceania and Asia. Whole tree like pods, leaves, seeds and flowers are highly rich in nutrients. Three non-governmental organizations, Trees for Life, Church World Service, and the Educational Concerns for Hunger Organization, have advocated the motto "Natural nutrition for the tropics" to stimulate the use of several plant species as food sources, including *M. oleifera*. Leaves can be directly consumed when fresh or sometimes cooked. Leaves of the *moringa* can be stored for longer period of time without loosing its nutritional characteristics by drying them and convert into powdered form. Without any doubt *moringa* has many health benefits which attract consumer's focus towards it. *Moringa* leaves have many essential nutrients some of them are Vitamin E, ß-carotene, protein, minerals, and essential sulfur-containing amino acids which are rarely found in daily diets. According to Fahey (2005), the content of vitamin C in *moringa* leaves is seven times higher than that of oranges, quantity of vitamin A is four times to carrots, calcium is four times and protein content is two times to milk. There is also the presence of antioxidant compounds in *moringa* leaves. Due to these several health benefits and nutrients, the leaves, seeds, pods and flowers are widely used in the preparation of various kind of food.

Benefits of *Moringa*

Moringa oleifera is a plant that has been praised for its health benefits for thousands of years. It is very rich in healthy antioxidants and bioactive plant compounds. Here are some benefits of *Moringa oleifera*:

1. Anti-diabetic properties

Moringa has been shown to cure both Type 1 and Type 2 diabetes. Type 1 diabetes is one where the patients suffer from non-production of insulin, which is a hormone that maintains the blood glucose level at the required normal value. Type 2 diabetes is one associated with insulin resistance. Type 2 diabetes might also be due to Beta cell dysfunction, which fails to sense glucose levels, hence reduces the signalling to insulin, resulting in high blood glucose levels. Several studies have shown that, *moringa* can act as an anti-diabetic agent.

2. Anti-cancer properties

At established concentrations *M. oleifera*can be used as an anticancer agent as it is natural, reliable and safe. According to some studies *moringa* can be used as an anti-neoproliferative agent, thus inhibiting the growth of cancer cells. Soluble and solvent extracts of leaves have been proven effective as anticancer agents.

3. Rich in Antioxidants

The antioxidant activity of *M. oleifera* in leaf, pod and seed extracts is particularly strong. Leaves contain the high content of flavonoids and phenols favors the reduction of oxidative damage to the main biomolecules through the inhibition of lipid peroxidation and the action of nitric oxide and induction of deoxyribose degradation, preventing the generation of free radicals. (Jamille Alencar sales *et al*., 2017) [12]

4. Anti-inflammatory and immunomodulatory activities

Anti-inflammatory, antioxidant, and immuno-modulatory (Shaila *et al*., 2010) properties of biophenols are abundant in *Moringa oleifera* Lam. Suggest that they may have beneficial effects on inflammatory bowel diseases (IBD)**.**

Nutritive properties of *Moringa*

Every part of *M. oleifera* is a storehouse of essential nutrients and antinutrients. The leaves of *M. oleifera* contain minerals like calcium, potassium, zinc, magnesium, iron and copper. Vitamins like beta-carotene of vitamin A, vitamin B such as folic acid, pyridoxine and nicotinic acid, vitamin C, D and E also present in *M. oleifera*. Phytochemicals such as tannins, sterols, terpenoids, flavonoids, saponins, anthraquinones, alkaloids and reducing sugar present along with anti-cancerous agents like glucosinolates, isothiocyanates, glycoside compounds and glycerol-1-9-octadecanoate. *Moringa* leaves also have a low calorific value hence can be used in the diet of the obese. The pods are fibrous and are valuable to treat digestive problems and thwart colon cancer. A research shows that immature pods contain around 46.78% fiber and around 20.66% protein content. Pods have 30% of amino acid content, the leaves have 44% and flowers have 31%. The immature pods and flowers showed similar amounts of palmitic, linolenic, linoleic and oleic acids. *Moringa* has lot of minerals that are important for growth and development among which, calcium is considered as one of the essential minerals for human growth. While 8 ounces of milk can provide 300-400 mg, *moringa* leaves can provide 1000 mg and *moringa* powder can provide more than 4000 mg. *Moringa* powder can also be used as a substitute for iron tablets, hence as a treatment for anemia. Beef has only 2 mg of iron while *moringa* leaf powder has 28 mg of iron. It has been reported that *moringa* have more iron than spinach. For proper growth of sperm cells a good dietary intake of zinc is essential and is also necessary for the synthesis of DNA and RNA. *M.oleifera* leaves show around 25.5–31.03 mg of zinc/kg, which is the daily requirement of zinc in the diet. PUFAs are linoleic acid, linolenic acid and oleic acid; these PUFAs have the ability to control cholesterol. Research show that *moringa* seed oil contains around 76% PUFA, making it ideal for use as a substitute for olive oil.

A complete list of nutrients available in leaves is shown in Table.

Table 2: The nutrient compostion of Moringa leaves

Nutrients	Fresh leaves	Dry leaves	Leaf powder
Calories (KCal)	92	329	205
Protein (g)	6.7	29.4	27.1
Fat (g)	1.7	5.2	2.3
Carbohydrates (g)	12.5	41.2	38.2
Fibre (g)	0.9	12.5	19.2
Vitamin B1 (mg)	0.06	2.02	2.64
Vitamin B2 (mg)	0.05	21.3	20.5
Vitamin B3 (mg)	0.8	7.6	802
Vitamin C (mg)	220	15.8	17.3
Vitamin E (mg)	448	10.8	113

Calcium (mg)	440	2185	2003
Magnesium (mg)	42	448	368
Phosphorus (mg)	70	252	204
Potassium (mg)	259	1236	1324
Copper (mg)	0.07	0.49	0.57
Iron (mg)	0.85	25.6	28.2
Sulphur (mg)	-	-	870

(Kruthy Doriya *et al*., 2016)

Ingredients Used in Soup Mix

Mung Dal Powder, *Moringa* Leaves Powder, Onion Powder, Garlic Powder, Ginger Powder, Salt, Spice Powder, Modified Corn Starch, Anti-caking Agent, Antioxidants, Anti Foaming Agent, Thickening Agent, Emulsifier, Stabilizer, Carrots, *Dals*.

Processing of *Mung Dal* Powder

Mung bean is converted into powder by using different type of processing methods.

Cleaning and Washing

Cleaning and washing of *Mung dal* was done 2 times with tap water and at last it is rinsed with water to remove dirt, dust and other adhering impurity.

Dehusking and splitting

It is the processes of removing the husk to obtain husk free *mung* bean and then it is splitted.

Drying

The mechanical drying of *mung* bean is not necessary; it can be dried at room temperature (27±3 ^{0}C) for 2-3 days. To protect from foreign impurities it should be covered either with cloth or paper.

Powder making

In this step dried *mung dal* was converted into powder through grinder and sifted according to desired size to get uniform powder and paste. (Alpana Singh *et al*., 2017) [1]

Preparation of *Mung* Bean Powder

Mung Bean
↓
Cleaning and Washing
↓
Dehusking and Splitting
↓
Soaking in water
↓
Germinating
↓
Sun Drying
↓
Grinding
↓
Mung Bean Powder (Alpana Singh *et al*., 2017) [1]

Fig 2: Preparation of Mung Bean Powder

Processing of *Moringa* Leaves into Powder

Selection of healthy leaves

Fungi like Cercosporaspp and Septoria lycopersic causing brown spot in the leaves and further turning the leaves yellow and killing them. Apart from fungi the most common pests on the leaves are grasshoppers, crickets and caterpillars [21, 11]. Therefore diseased and damaged leaves are discarded manually just after the collection of fresh leaves.

Washing

Collected leaves are washed in running tap water till the removal of dirt. After this leaves are soaked in 1% saline solution (NaCl) for 5 minutes to remove microbes. Leaves are further washed with 70% ethanol followed by twice washing with distilled water. This step plays a substantial role in removal of dust, pathogens as well as microbes present on the leave surface.

Draining

The excess water can be removed by spreading the leaves in sunlight for a brief period till the removal of water present on the leaf surface.

Selection of healthy leaves

After the harvesting, some fungi cause browning in the leaves. Even the most common pests on the leaves like leaf miner, mites and caterpillars etc., can damage the leaves at feild. Therefore selection of healthy leaves is necessary to get the good quality of end product.

Washing

After selection leaves are washed under running tap water to remove dirt and other impurities. Generally, for washing 1% saline solution (NaCl) is used for soaking of leaves for 5 minutes to remove microbes. Then further 70% ethanol washing followed by washing with distilled water 2 times. This is the basic step which plays an important role in removal of dirt, microbes as well as any other impurities and pathogens present on the surface of leaves.

Draining

The remaining part of water in leaves can be drained or removed by spreading them under sunlight.

Drying
According to previous studies, if leaves are dried under direct sunlight only 20-40% of vitamin A will be retained, but that 50-70% will be retained if leaves are dried in the shade so shade drying is generally recommended. A well ventilated room is required with maintained sterile conditions. Mosquito net must be used for this purpose, because these materials give a space between the floor and the leaves. There is no entrance for insects, rodents or even for dust. Air circulation can be better by using ceiling and floor level inlets and outlets protected with a clean filter to keep the dust and sun out. It is feasible to use a fan, but contamination can be increased with germs in the air so the air must not be directly oriented towards the leaves. It is preferable to roll the leaves over at least once, with sterile gloves, to enhance uniform drying. Leaves should be completely dry within a maximum of 4 days. The loading density should not exceed 1 kg/m^2. All employees on work must ensure that, while on duty, personal cleanliness and hygiene are maintained. Personal protective equipment (PPE) such as head caps, nose masks, disposable gloves, etc. must be used during whole process.

Grinding
Grinding of dried leaves can be done by mortar and pestles. At small scale level pulmonizer machine can be used for fine grinding. Commonly 0.5 mm – 1.0 mm pore size screen is used for screening and sifting of the fine grinded leaf powder.

Drying of the leaf powder
Moringa leaf powder should be dried at 50 ^{0}C for 30 minutes to reduce moisture content because *moringa* leaf powder immediately starts to absorb moisture and the product can reabsorb humidity during or after grinding. It is sensitive to light and heat, so exposure to light and heat should be avoided when stored because it can degrade and reduce the nutrient content. *Moringa* Leaf Powder can be stored for up to 6 months under the following conditions: clean, dried powder stored in air-tight containers, protected from light and humidity, and kept below 24 °C (75.2 °F). (Satya Prakash Mishra *et al*., 2012) [14]

Preparation of Spices Mix Powder
Dried cinnamon, cumin, black pepper, were mastered by electric balance and roasted. Then spices were ground by electric grounder and mixed with salt to make spices mix. (Monirul Islam *et al*., 2018) [9]

Preparation of Garlic Powder
Raw garlic was blanching by 100 ˚C hot water for 5 minutes and dried by oven drying at 65 ˚C for 6 hours. Then dried clove of garlic was ground by electrical grounder. The ground powder was packed in LDPE bag and storage at room temperature. (Monirul Islam *et al*., 2018) [9]

Preparation of Ginger Powder
Raw ginger was blended by electric blender and dried by oven drying at 65 ˚C for 6 hours in thin layer. Then dried ginger was ground by electrical grounder. The ground powder was packed in LDPE bag and storage at room temperature. (Monirul Islam *et al*., 2018) [9]

Preparation of Onion Powder
Raw onions were cut into thin slices and dried by oven drying at 50 ± 5 ˚C for 6-8 hours. (Anju Sangwan *et al*., 2010) [3]

Modified Corn Starch
The main contribution of the starch is to provide texture to the foods. Starch can be used for various applications in industries such as a thickener, colloidal stabilizer, gelling agent, bulking agent, water retention agent and adhesive. Much of industrial starch is processed or modified to enhance its dissolution in water, to lower down gel viscosity and reduce retrogradation tendency of amylose. Extrusion cooking has been successfully used for modification of starch.

Anti-caking agents
For controlling the lumps formation and make the products feasible for packaging and transportation anti-caking agents are used. They permits the free flowing conditions to the foods. They do not allow the particles of food to stick together. Anti-caking agents consist of such material as starch, magnesium carbonate, and silica. (Pandey and Upadhyay, 2012) [11]

Antifoaming agents
The basic function of anti-foaming agents in foods is reduced the formation of foam or to prevent it. (Pandey and Upadhyay, 2012) [11]

Antioxidants
Generally antioxidants are used to prevent the process of oxidation and also aid to preserve the foods for longer period of time. Antioxidants can control the growth of bacteria as they worked as oxygen scavengers. Oxidation of unsaturated fats takes place and cause rancidity rendering to foul smell and discoloration of food. (Pandey and Upadhyay, 2012) [11]

Emulsifiers
It is a type of additive that helps to stabilize the mixture of two immiscible liquids and balances the texture of the food product. Emulsifiers let water and oils to remain mixed together in an emulsion. It stops fats from clotting together. (Pandey and Upadhyay, 2012) [11]

Stabilizers
It is a type of additive which helps to preserve the structure. It makes possible to maintain a uniform diffusion of two or more components. Stabilizers like gelatine, pectin or alginate provide foods a firmer texture also prevents crystallization in frozen products. (Pandey and Upadhyay, 2012) [11]

Conclusion
Among the many foods, *mung dal* based food products are widely consumed than any other lentils based products. To increase the utilization of *mung dal* and add to diversification in the market, which is mostly dependent on products from wheat and rice. So, this is an experiment to develop Ready-to-cook recipe from *mung dal*. As people are getting more concerned of their health and fitness this soup could be the best substitute food with high protein. People are getting busy with their work, sometimes they do not even have time to cook food which leads to increase the demand for instant foods, ready-to eat snacks and ready-to-cook products with good nutritional quantity. Incorporation of *moringa* powder is even more beneficial as it has some common benefits as *mung dal*. The leaves of *moringa* are rich in iron. Instead of many other benefits this soup mix can treat malnutrition in children below 3 years as it contains both *mung dal* powder as well as *moringa* leaves powder.

References

1. Alpana Singh, Dr. Mamta Jaiswal, Kiran Agrahari, Archana Singh. Standardization and Development of *Mung Dal* Based Products. ISSN: 2395-7476 IJHS 2017: 3(1):358-362 ©2017 IJHS
2. Anita S, Sameshwari T, Kalpana B. Formulation and evaluation of instant soup powder using millets, ISSN: 0975-833X, International Journal of Current Research : Vol.8, Issue, 08, pp.35668-35673, August, 2016.
3. Anju Sangwan A, Kawatra, Salil Sehgal. Nutritional Evaluation of Onion Powder Dried Using Different Drying Method. J. Dairying. Foods & H.S. 2010; 29(2):1510-0153.
4. Convenience I. Characterization of Instant Soup Mix, 2011, 158-197.
5. Dongyan Tang, Yinmao Dong, Hankun Ren, Li Li, Congfen He, A review of phytochemistry, metabolite changes, and medicinal uses of the common food *mung* bean and its sprouts (*Vignaradiata*)Chem Cent J, 2014, 8. PMCID: PMC3899625,
PMID: 24438453doi: 10.1186/1752-153X-8-4
6. Farzana T, Mohajan S, Saha T *et al*. Formulation and Nutritional Evaluation of a Healthy Vegetable Soup Powder Supplemented with Soy Flour, Mushroom, and Moringa Leaf. Food Science & Nutrition. 2017; 5:911-920. https://doi.org/10.1002/fsn3.476
7. Kavya N, Kavya B, Ramarao V, Kishore Kumar R and Venkateshwarlu G, Nutritional and Therapeutic Uses of Mudga [Vignaradiata (L.) R. Wilczek]: A Potential International Dietary Component. Int. J Res. Ayurveda Pharm. 2014; 5(2):238-241.
http;//dx.doi.org/10.7897/2277-4343.05248
8. Lakshm Ipriya Gopala krishnan, Kruthi Doriya, Devarai Santhosh Kumar, *Moringa oleifera*: A Review on Nutritive Importance and Its Medicinal Application. Food Science and Human Wellness.2016; 5:49-56.
9. Monirul Islam, Md Nazirul Islam Sarker, Md Shahidul Islam, Adhita Sri Prabakusuma, Niaz Mahmud, Yang Fang *et al*. Development and Quality Analysis of Protein Enriched Instant Soup Mix. Food and Nutrition Sciences, 2018; 9:663-675 ISSN Online: 2157-9458 ISSN Print: 2157-944X. http://www.scirp.org/journal/fns
10. Neeraj Gandhi, Baljit Singh, Savita Sharma, Swati Kapoor. Extrusion Process Optimization of Corn Starch to Develop Instant Vegetable Soup Mix. *Int J Curr. Microbiol. App. Sci.* 2018; *7*(2):2886-2910 *ISSN: 2319-7706*, 2018, 7(2). http://www.ijcmas.comPradeep Kumar Dahiya MJR, Nout, Martinus A. Van Boekel, Neelam Khetarpaul, Raj BalaGrewal *et al*. Nutritional Characteristics of *Mung Dal* Foods. British Food Journal, 2014.
11. Pandey RM, Upadhyay SK. Food Additive. Chapter, 2012, 1-30. DOI: 10.5772/34455.
12. Raimunda Samia Nogueira Brilhante, Jamille Alencar Sales, Vandbergue Santos Pereira, Research advances on the multiple uses of *Moringa oleifera*: A sustainable alternative for socially neglected population. Asian Pacific Journal of Tropical Medicine.
http://dx.doi.org/10.1016/j.apjtm.2017.07.002
13. Mathangi Sudarsan S, Geethanjali Santhanam S, Visalachi V. Development and formulation of instant soup mix from sprouted horse gram and radish leaves, ISSN: 2395-7476 IJHS. 2017; 3(1):346-349 © 2017 IJHS
14. Satya Prakash Mishra, Pankaj Singh, Sanjay Singh. Processing of *Moringa oleifera* Leaves for Human Consumption. Online ISSN 2277-1808 Bull. Env. Pharmacol. Life Sci. ©, Academy for Environment and Life Sciences, India. 2012; 2(1):28-31.