iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** V **Month of publication:** May 2022

DOI: https://doi.org/10.22214/ijraset.2022.42524

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue V May 2022- Available at www.ijraset.com

Development of Neem Based Instant Herbal Soup Mix

Hema Prabha. P[1], Ponnazhagammai N[2], Pooja Sri V S[3], Sharoon Roja German A[4], Sruthi V[5], Tejaswini S[6]
[1]*Associate Professor (SS), Dept of Food Processing and Preservation Technology, Faculty of Engineering, Avinashilingam Institute for Home Science and Higher Education for Women, ,Coimbatore, TamilNadu, India*
[2, 3, 4, 5, 6]*Scholars, Food processing and Preservation Technology, Dept, of Faculty of Engineering, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, TamilNadu,,India*

Abstract: ***In India there are several underutilized herbal plants that are of vital importance. Those under-utilized herbal plants can be very well naturally processed and used for consumption. The purpose of this study is aimed at developing an instant healthy herbal soup mix using various under-utilized herbal plants such as A.indica leaf powder, moringa leaf powder along with various other herbal ingredients.***
The major ingredients neem and moringa leaves are profoundly known for their enormous health benefits. Other ingredients such as onion, garlic, ginger, pepper species; are known to impart great flavor for the cooked product. Drying is one of the most effective method of preserving foods and powdered products are considered best in various aspects such as storage, package, consumption etc.
Drying was done over different stages for each ingredients and the best was selected based on minimal loss in the nutrients. Physio-chemical tests and organoleptic test were carried out for the developed soup mix.
Keywords: Instant soup mix, Neem leaves, Moringa oleifera leaves, Drying, Shelf life.

I. INTRODUCTION

In modern life, people have become more aware of the health benefits of consuming traditional foods. This led to the improvement in the consumption of traditional food and its processing. Soups are one of the best and easily digestible traditional liquid food packed with enormous health benefits. The tradition of consumption of soup roots back to 20,000 BC [1].
An increase in population and urbanization has led to reduction in time for healthy food preparation and consumption. Therefore people tend to consume fast foods despite reduced health benefits. Hence an attempt is made to prepare a soup that requires less time for preparation without compensating health benefits. Instant soups play an important role in balancing the nutrients required for people to stay healthy and also it is easy to prepare with the least time. Also, they do not need any preservatives or refrigerators to preserve them [2]. It has high nutritive value, particularly it is rich in fibre and Vitamin-C. It is notable that the product can be hydrated and made into soup in a short time. The formulation and development of new products from easily available raw materials have received a lot of attention. Considering their lesser weight, they are easy to ship and can be readily available around the clock. Functional soup can become an alternative food for breakfast because it could fulfill the adequacy of energy and nutrient required by the body, is very practical in preparation, and takes only a short time to serve. For maintaining nutritive value whole, legumes and vegetables are added to it [3]. Due to these needed carbohydrates, proteins, fiber, and amino acids are provided.
Soups are one of the basic liquid food which are prepared using combination of various ingredients such as vegetables, leaves, meat, cereals and pulses etc.,. The major ingredients used for soup preparation are *Azadirachta indica, Moringa oleifera, Piper longum, Piper nigrum, Zingiber officinalae, Allium sativum, Allium ascalonicum.*

II. REVIEW OF LITERATURE

A.indica is an evergreen tree species which is abundantly grown in various parts of India subcontinent. The usage of neem for health enrichment is dated back to our ancestral period. It is one of the readily available traditional herbal plant with various benefits that aid in treatment of ailments in humans [4]. It is one of the readily available traditional herbal plant with various benefits that aid in treatment of ailments in humans. Neem leaves contain quercetin and nimbosterol as well as liminoids which are known for their antimicrobial effects on consumption. The Quercetin is a kind of polyphenolic flavonoid. Neem contains 7.1% of Proteins and 22.9% of Carbohydrates and also calcium, phosphorus, minerals, vitamins, chemical compounds and pigments [5].

M.oleifera is one of the best but, underutilised super food [6]. *M. oleifera* are known for the presence of various antioxidants in its leaves making it an abundant source of natural antioxidant [6]. The presence of compounds such as amino acids, vitamins, minerals etc., are known to enhance and activate enzymes, hormones and other functions.

Allium cepa.L the Queen of Vegetables is one of the most consumed vegetable [7]. The onion bulb is a bunch of nutrient source along with the presence of important bioactive component, flavonoids [8,9]. Onions are majorly known for its abundance of sulphur components which has effects [10].

The flavonols present in onions are the main health promoting components [11]. In low temperature, less time onion drying ensured the detainment of onion properties and Phenolic compounds [12].

Allium sativum is an aromatic bulbous flowering spice plant. *A.sativum* bulb are rich source of flavonoids, vitamins, tannins, antioxidants etc. Garlic is a commonly used spice and its dried form is one of the most preferred flavouring substance in pre-processed and instant foods [13]. Garlic contains 8 main group amino acids along with 17 other amino acids [14]. It is also a great source of sulphide components. Garlic has been proven effective as anti-inflammatory and lipid lowering agent. It has also been proven as effective against various diseases such as skin disease, bone disease, diabetics etc. [15].

Piper nigrum the king of spices is an age old traditional medicinal herbal plant. There are various types of peppers, but the most commonly used pepper is black pepper.

The pepper itself is a preservative as well as a flavouring substance. The pungent flavour of pepper is because of the presence of the pungency alkaloid, Piperine [16].

Piper nigrum is known to possess antioxidant activity due to the presence of flavonoids and phenolic compounds [17, 18]. Spices are mainly known for its digestion stimulation action and most importantly, the Piperine that we consume is the digestion stimulant that plays vital role in inducing the pancreatic enzyme secretion that for digestion [19, 20].

P.longum is a kind of woody flavoured fruit with the same spiciness as that of *Piper nigrum*. The basic chemical components extracted from them that are effective in humans are piperine, piperine longumine, pipermonaline etc. Also, *Piper longum* contains various other compounds such as lignans, esters, volatile acids, organic acids as their important constituents [21].

They also exhibit various other properties such as anticancer, antioxidant, anti-inflammatory, antimicrobial and so on [22 - 25]. It is notable that considering the benefits of *P.longum*, it has been widely used in cooking and it is a well-known traditional medicinal food.

Z.officinalae one of the nature's beneficial underground factory of important compounds that aid in human health promotion [26]. It is one of the most less – toxic way of treating disease with greater efficiency [27]. Ginger are not only used as spice from the age old period, they are one among the natural digestive medicine that can be included in the daily food we consume. Ginger contains number of bioactive compounds that have been proven to be alleviating for various health problems [28]. The primary constituents of ginger includes gingerols, anthocynanins and tannins in its roots [29]. Ginger contains 2–12% fixed oil, 3–8% fibre, 40–70% starch, 6–20% protein, 1.5%-3% essential oil, 8% ash, 9–12% water, and other few minerals and colouring materials [30].

III.MATERIAL AND METHODOLOGY

The raw materials used for the preparation of the Instant Herbal Soup mix includes Azadirachta indica, Moringa oleifera, Piper longum, Piper nigrum, Zingiber officinalae, Allium sativum, Allium cepa.

The fresh neem leaves were collected and the leaves were blanched to around 10 to 15 times to remove the bitterness from the leaves. The blanched leaves were first shadow dried for 30 minutes initially to remove the wetness, and then they were dried in Hot air oven at 45℃ for 15 hours. Fresh Moringa leaves were collected and the leaves were blanched to remove the unwanted residues. The blanched leaves were then shadow dried for 30 minutes. After the shadow drying, the leaves were subjected to Hot air oven drying at 100℃ for 3 hours. Onions were sorted and checked for freshness. Then those onions were peeled and washed. The washed onions were chopped into medium pieces and the scaled off. The scaled onion pieces were placed on a tray and dried in Hot air oven at 130℃ for 3 hours. The garlic bulb is inspected for defects and the best bulb is selected and they are peeled off. The garlic cloves are separated from the main stem and are further peeled. The peeled garlic cloves are washed once and cut into halves and placed in a tray. The tray is then placed in hot air oven at 130℃ for 3 hours for drying .Best ginger root is selected and is peeled off. The peeled ginger root is sliced and spread out in a drying tray and dried at 150℃ for 4 hours .The other ingredients that is the Piper longum and Piper nigrum are used in a dried form for powdering of the ingredients and product preparation. The dried ingredients are separately powdered using electric miller for fine powdering of the major ingredients. Then the powdered ingredients along with salt for flavouring is mixed in a calculated ratio.

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue V May 2022- Available at www.ijraset.com

Fig.1 dried leaves powder

Fig.2 Dried Onion, Garlic and Ginger Powder

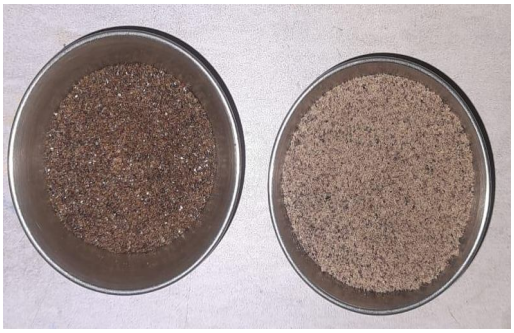


Fig.3 Powdered Black Pepper and Indian Long Pepper

Fig. 4 Final Product

A. Proximity Analysis

1) Moisture Content: Moisture content is that how much water is in a product. It influences the physical properties of a substance, including weight, density, viscosity and conductivity. It is generally determined by weight loss upon drying. Water activity, aW, is a measure of how much of that water is free, unbound, and available to microorganisms to use for growth. Microorganisms will not grow below a certain water activity level 0.90 for most pathogenic bacteria, 0.70 for spoilage molds, and 0.60 for all microorganisms. A sample of 5 gm of the Instant soup mix is taken in a dry bowl and is kept for drying in hot air oven at 120°C for 1 hour. The sample is weighed at an interval of 15 minutes for 1 and half an hour to determine the drying characteristics of the sample.

2) *Ash Content:* Ash content represents the total mineral content in foods. It is a part of proximate analysis for nutritional evaluation. Because certain foods are high in particular minerals, ash content becomes important that one can usually expect a constant elemental content from the ash of animal products, but that from plant sources is variable. Dry Ash is an incineration at high temperature (525◦C or higher) and the Incineration is accomplished with a muffle furnace. Several models of muffle furnaces are available, ranging from large-capacity units requiring either 208 or 240 V supplies to small bench top units utilizing 110-V outlet. A 5 gm sample is kept in crucible and is placed in the Muffle furnace at 550°C for 2 hours. After 2 hours, the sample is let to cool down in a desiccator for 30 minutes and is weighed.
3) *Fat Content:* Most fats and oils contain both saturated and unsaturated fats in different proportions As part of a healthy diet, you should try to cut down on foods and beverages that are high in saturated and trans fats and replace them with unsaturated fats. Each leaf of the Neem consists of 3.3 gm of fat. Each fresh leaves in Moringa oliefera leaves consists of 1.7gm and leaf powder consists of 2.3gms of fat as per the research The sample was liquefied and made into soup using distilled water. A concentrated solution of Sodium hydroxide is added and is kept in water bath for about 5 minutes. A small amount of Ethanol solution is added to the liquid in water bath and is observed. The formation of froth is the indication for presence of fats.
4) *Protein Content:* Proteins are made up of chains of amino acids joined by peptide bonds, they can be hydrolysed to their component amino acids, which can then be measured by ion-exchange, gas-liquid or high-performance liquid chromatography. The sum of the amino acids then represents the protein content of the food. This is sometimes referred to as a “true protein”. Neem leaves contain 7.1 Percent Protein and 22.9 percent carbohydrates .They also contain the mineral, calcium, phosphorus, vitamin C and carotene 3 and Moringa oliefera’s immature pods contains around 46.78% fibre and around 20.66% of protein content as per the research.The Protein content of the Sample is tested using the UV – Vis Spectrophotometry. In this method, the sample is subjected to the UV Radiations were the proteins’ light absorption capacity is measured to determine the protein content.

IV. RESULTS AND DISCUSSION

The neem leaf is used to reduce tooth plaque and to increase immunity power. Neem contains chemicals that might help reduce blood sugar levels, cardiovascular diseases, heal ulcers in the digestive tract, prevent pregnancy, and prevent plaque from forming in the mouth. Daily intake of neem range to 60mg for 10 weeks is safe. Neem is not safe when taken by mouth in large doses or for long periods of time. It might harm the kidneys and liver. Various physio-chemical proximate analysis tests were conducted on the soup mix powder. The tests include moisture content analysis, Ash content determination, Protein content conformity test, Fat content analysis, Vitamin C determination, Caloric value identification, Fibre and Iron content determination tests.

The table 1 shows the results of the tests conducted on the Instant Herbal Soup Mix and the values. From the table, it is clear that most of the moisture from the product is removed leaving the product with a Moisture Content of 3.49%. It can be found that the product contains Partial amount of Vitamins and minerals that are present in the Raw Materials. The Fig. 5 shows the drying rate of the product after final mix of all the ingredients, it can be concluded that there is some moisture left even after drying all the ingredients separately. This drying is carried out in order to determine its shelf life and its packaging capacity. It is found out that vacuum pouch packaging can be decided to be efficient for storage and transportation of the product. On considering the health benefits of the Herbal Soup, the ingredients are of very high nutritive values and are of high health benefits. All the ingredients used are naturally highly beneficiary in improving health in general. Fig. 6 explains the sensory attributes of the soup was acceptable in the aspect of color of the final product, flavor obtained on cooking of the soup, and the taste of the soup on consumption and overall appearance and the acceptance. The soup will be a complete package of essential nutrients on considering the Nutritive value of the Instant Herbal Soup Mix.

TABLE I. Proximity Analysis Results

ANALYSIS	RESULTS
Calorific Value	156 Kcal
Moisture Content	3.49%
Ash Content	10.8%
Fat	4.056 g/100g
Fibre	3.0 g/100g
Sugar	0
protein	2.11
VitaminA: 0.08 g/100g	VitaminC: 0.06 g/100g
Calcium: 3.0 g/100g	Iron: 0.03 g/100g

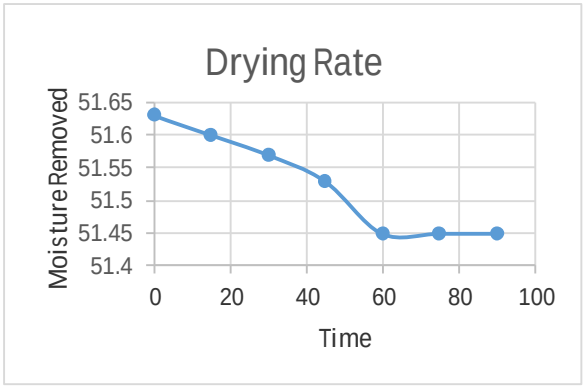


Fig. 5 A line graph showing the Drying characteristics of the Soup Powder

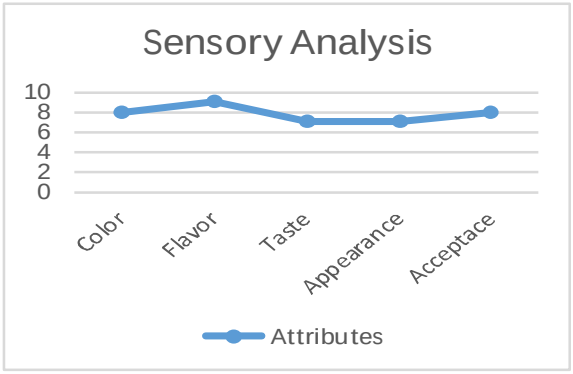


Fig. 6 A line graph showing the Drying characteristics of the Soup Powder

V. CONCLUSIONS

This research mainly aimed at development of an instant liquid based food packed with incredible nutrient benefits that aids in betterment of living. This instant soup mix is prepared by drying fresh ingredients in such a way ensuring the detainment of most of the nutritional qualities of them. All those ingredients such as neem, Moringa leaves, onion, garlic, black pepper, long pepper and ginger are of great importance in maintaining the health. The final product's estimated storage life is to be about 6 months without refrigeration as all the ingredients used are in dry form.

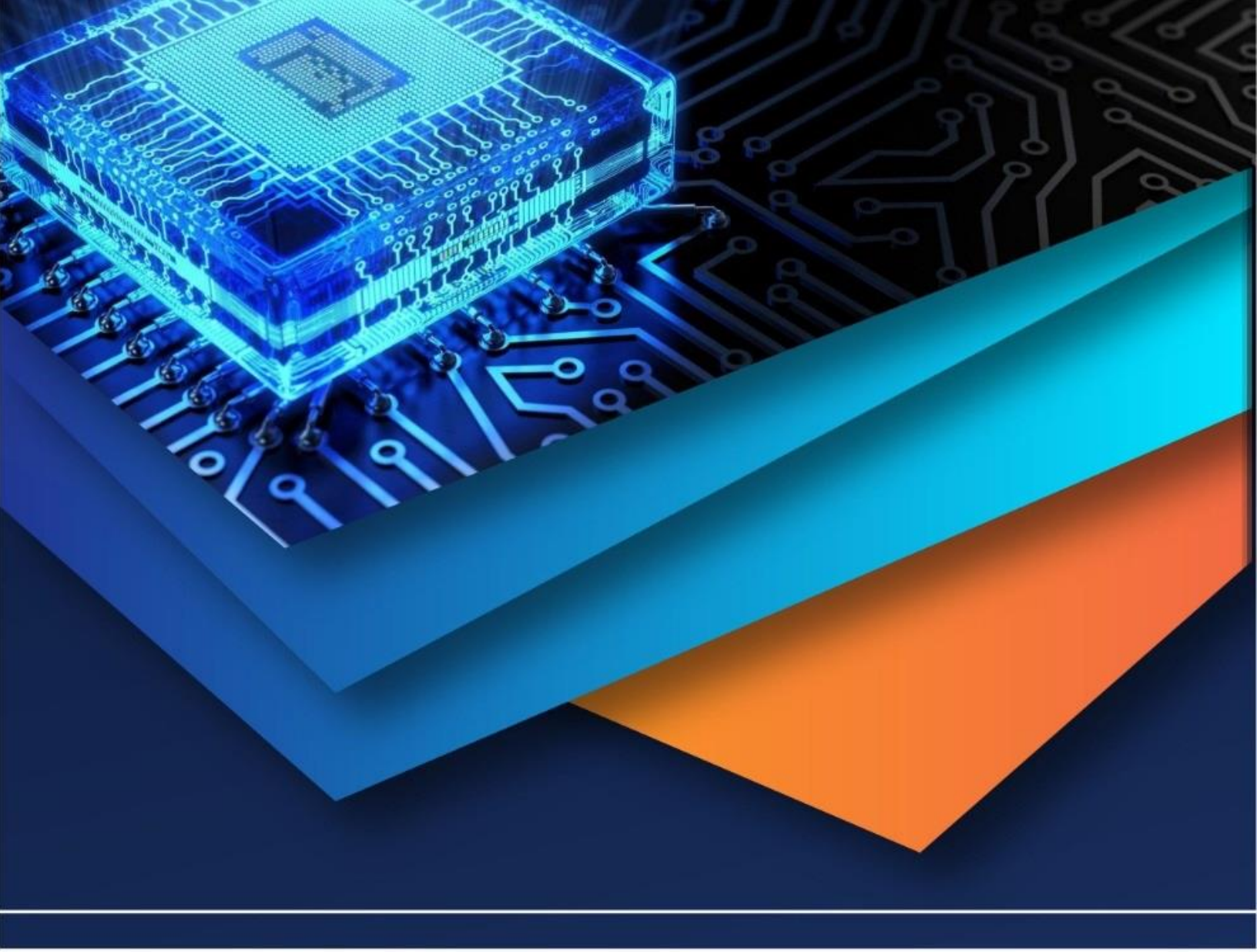
VI. ACKNOWLEDGMENT

We would like to thank our Guide who guided and motivated us to do the research work and all our staffs. We would like to thank our department Head for encouraging our work and for their continuous support and motivation for completing this research article. Our sincere thanks to our Institute which stood by our side on all our times to successfully complete our Graduation Program.

REFERENCES

[1] Wu, X., Zhang, C., Goldberg, P., Cohen, D., Pan, Y., Arpin, T., & Bar-Yosef, O. (2012). Early pottery at 20,000 years ago in Xianrendong Cave, China. Science, 336(6089), 1696-1700.
[2] Sudarsan, S. M., Santhanam, S. G., & Visalachi, V. (2017). Development and formulation of instant soup mix from sprouted horse gram and radish leaves. International Journal of Home Science, 3(1), 346-349.
[3] Abdel-Haleem, A. M., & Omran, A. A. (2014). Preparation of dried vegetarian soup supplemented with some legumes. Food and Nutrition sciences, 5(22), 2274.
[4] Chopra, R. N., Nayer, S. L. and Chopra, I. C., Glossary of Indian Medicinal Plants, CSIR, New Delhi, 1956
[5] Kirtikar, K. R. and Basu, B. D., in Medicinal Plants (eds Blatter, E,, Cains, J. F., Mhaskar, K. S.), Vivek Vihar, New Delhi, 1975, p. 536.
[6] El Sohaimy, S. A., Hamad, G. M., Mohamed, S. E., Amar, M. H., & Al-Hindi, R. R. (2015). Biochemical and functional properties of Moringa oleifera leaves and their potential as a functional food. Global Advanced Research Journal of Agricultural Science, 4(4), 188-199.
[7] Anwar F, Latif S, Ashraf M, Gilani AH (2007). Moringa oleifera: A food plant with multiple medicinal uses, Phytotherapy Res. 21: 17-25
[8] Tram, N. L.; Chiharu, H.; Makoto, S.; Hiromune, A.; Koji, K.; Ryo, Y. Antioxidative compounds from the outer scales of onion. J. Agric. Food Chem. 2005, 53, 8183-8189.
[9] Ramos, F. A.; Takaishi, Y.; Shirotori, M.; Kawaguchi, Y.; Tsuchiya, K.; Shibata, H.; Higuti, T.; Tadokoro, T.; Takeuchi, M. Antibacterial and antioxidant activities of quercetin oxidation products from yellow onion (Allium cepa) skin. J. Agric. Food Chem. 2006, 54, 3551-3557.
[10] Rune, S.; Torgils, F.; Ingunn, M. V. Onions: a source of unique dietary flavonoids. J. Agric. Food Chem. 2007, 55, 10067-10080.
[11] Li, Q., Wang, Y., Mai, Y., Li, H., Wang, Z., Xu, J., & He, X. (2020). Health benefits of the flavonoids from onion: Constituents and their pronounced antioxidant and anti-neuroinflammatory capacities. Journal of Agricultural and Food Chemistry, 68(3), 799-807.
[12] Bamba, B. S. B., Komenan, A. C. A., Kouassi, K. K. P., & Soro, D. (2020). Effects of onion bulb processing conditions on drying characteristics, physicochemical and functional properties profile of onion (Allium cepa L.) powder. Journal of food science, 85(10), 3345-3354.
[13] Bianchini, F.; Vainio, H. Allium vegetables and organosulfur compounds: do they help prevent cancer Environ. Health Persp. 2001, 109, 893-902.
[14] Fenwick G.R., Hanley A.B., Whitaker J.R. The genus allium. Part 2. Crit. Rev. Food Sci. Nutr. 1985;22:273–377.
[15] Ansary, J., Forbes-Hernández, T. Y., Gil, E., Cianciosi, D., Zhang, J., Elexpuru-Zabaleta, M., ... & Battino, M. (2020). Potential health benefit of garlic based on human intervention studies: A brief overview. Antioxidants, 9(7), 619.
[16] Jiang T.A. Health Benefits of Culinary Herbs and Spices. J. AOAC Int. 2019;102:395–411..
[17] Acharya SG, Momin AH and Gajjar AV (2012) Review of Piperine as A Bio- Enhancer. Am J Pharm Tech Res 2:32-44

[18] Taqvi SI, Shah AJ, Gilani AH (2008) Blood pressure lowering and vasomodulator effects of piperine. See comment in PubMed Commons below J CardiovascPharmacol 52: 452-458.
[19] Hussain A, Naz S, Nazir H, Shinwari ZK (2011)Tissue culture of Black pepper (Piper nigrum L.) in Pakistan. Pak J Bot 43: 1069-1078.
[20] Ahmad N, Fazal H, Abbasi BH, Farooq S, Ali M, et al. (2012) Biological role of Piper nigrum L. (Black pepper): A review. Asian Pacific J Trop Biomed: S1945-S1953
[21] Kumar, S., Kamboj, J., & Sharma, S. (2011). Overview for various aspects of the health benefits of Piper longum linn. fruit. Journal of acupuncture and meridian studies, 4(2), 134-140.
[22] Anuradha V, Srinivas PV, Rao JM. Isolation and synthesis of isodihydropiperlonguminine. Nat Prod Res 2004;18:247−51.
[23] Pradeep CR, Kuttan G. Effect of piperine on the inhibition of lung metastasis induced B16F/10 melanoma cells in mice. Clin Exp Metastasis 2002;19:703−8.
[24] Natarajan KS, Narasimhan M, Shanmugasundaram KR, Shanmugasundaram ER. Antioxidant activity of a salt/ spice/herbal mixture against free radical induction. J Ethnopharmacol 2006;105:76−83.
[25] Koul IB, Kapil A. Evaluation of the liver protective potential of piperine, an active principle of black and long peppers. Planta Med 1993;59:413−7.
[26] L. M. Reyes-Fermín, O. E. Aparicio-Trejo, S. H. Avila-Rojas, T. Gómez-Sierra, E. Martínez-Klimova and J. Pedraza- Chaverri, Natural antioxidants' effects on endoplasmic reticulum stress-related Diseases, Food Chem. Toxicol., 2020, 138, 111229.
[27] J. Poltronieri, A. B. Becceneri, A. M. Fuzer, J. C. Cesar, A. C. Martin, P. C. Vieira, N. Pouliot and M. R. ominetti [6]-gingerol as a cancer chemopreventive agent: A review of its activity on different steps of the metastatic process, Mini-Rev. Med. Chem., 2014, 14, 313–321.
[28] Singletary, K. (2010). Ginger: an overview of health benefits. Nutrition Today, 45(4), 171-183.
[29] Shahrajabian, M. H., Sun, W., & Cheng, Q. (2019). Clinical aspects and health benefits of ginger (Zingiber officinale) in both traditional Chinese medicine and modern industry. Acta agriculturae scandinavica, section b—Soil & Plant Science, 69(6), 546-556.
[30] Chan EWC, Lim Y, Wong S. 2009. Effects of different drying methods on the antioxidant properties of leaves and tea of ginger species. Food Chem. 113:166–172.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY