

Evaluation of Finger Millet Herbi Dumpling for Proximate composition, Minerals and Micronutrient Content

Comment [D1]: Consider this: "Evaluation of proximate composition, minerals and micronutrient contents of finger millet herbi dumpling"

Abstract

In India, finger millet (*Eleusinecoracana*) also known as Ragi and it is comes from Graminae family. It is the widely grown in different part of India, Asia, and Africa. In India, Orissa, Jharkhand, Uttarakhand Maharashtra, Karnataka, Tamil Nadu, and Andhra Pradesh are the leading Ragi growing states. Finger millet is rich source of calcium, iron and dietary fiber and many diseases like anemia, teeth disorder etc. can be controlled by using in our regular diet and it is an ideal food for sugar patients due to its low content of sugar and slow release of glucose in the body. This study was conducted to determine the proximate composition minerals and micronutrients content of the herbi dumplings. However, it was observed that herbi dumplings were nutritionally enriched and highly acceptable.

Comment [D2]: Scientific Abstract should be a summary of the work done in prose and consist of introduction (title of the work), methodology, analysis done, statistical tool used for data analysis, result obtained (empirical) and inference.

Comment [D3]: Hence this abstract will be suitable for the first paragraph of the introduction

Keywords: Ragi Flour, Herbi Dumpling, nutritional composition

Introduction

The term millet is derived from the French word "mille" which means thousand, with a handful of millet containing up to 1000 grains (Shahidi&Chandrasekara, 2013). Finger millet (*Eleusinecoracana*) popularly well-known as ragi, nachni or Nagli is one of the important millets grown broadly in different regions of India and Africa ((Muktar, et.al., 2018; Majumder et al., 2006). Finger millet is a drought resistant crop and used as a staple food in India as well as African countries (Devi et al., 2014).

Comment [D4]: delete

Comment [D5]: these names should italised

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Finger millet is similar to reddish mustered and it is fast growing cereal crop that reaches at maturity level within 3 to 6 months and sometimes in only 45 days (Dida et al. 2006). Commonly, it is harvested in December and January. Finger millet is similar to protein rice (6-8%) and fat (1-2 %) and better than rice and wheat with reference to minerals and micronutrients (Kumari, P. L. and Sumathi, S. 2002; Dubey, P. and Mishra, S.). Finger millet is an

Comment [D7]: is there anything like "protein rice"? or protein content of finger millet is similar to that of rice - - -

Comment [D8]: initials of authors are not cited in text. Put date to Dubey and Mishra

enriched of carbohydrates, proteins, minerals, sugars, starch and dietary fibre. The proximate composition of finger millet grains has been studied by many researchers (Wadikar et al., 2007). Finger millet is also a major source of micro nutrients especially of calcium and iron (Verma et al., 2013). Calcium and Iron play a significant role in the human body. Deficiency of calcium can lead to muscles pain and increase the risk of fractures. Deficiency of iron can lead to Anaemia (Verma and Mishra, 2018). Therefore, Ragi plays a key role as a natural treatment for several patients who suffering from Anaemia, diabetes, muscles pain and also bone fractures. Finger millet is capable of fulfil the requirement of calcium and iron in human body (Siddiqui, et al., 2015).

Comment [D9]: "rich in"

Comment [D10]: are

Comment [D11]: fulfilling

Utilization of Finger millet involves traditional and other processing methods such as soaking, malting, cooking, fermentation, popping and radiation (Rao and Muralikrishna, 2001). These processes are utilised to improve digestibility and nutritional quality of micronutrients and inhibitory activities of antinutrients such as phenols, phytic acids and tannins (Pawar and Dhanvijay, 2007).

Comment [D12]: do you process to improve inhibitory activities of ant nutrient or to reduce/stop them?

Eryngiumfoetidum, *Rumexacetosa* and *CentellaAsiatica* were used in preparation of herbidumbling. *Eryngiumfoetidum* is popularly known by several local names, such as Mexican coriander, spirit weed, fit weed, cilantro and bhandhania (Duke JA., 2009). This herb is used by indigenous people of Northeast India as a kitchen food. The fresh leaves of *Eryngiumfoetidum* contain over 85% moisture, 3.3% protein, 0.6% fat, 6.5% carbohydrate, 1.7% ash, 0.06% phosphorus and 0.02% iron (Culantro, 1999). The nutritional value of the plants growing in Assam, India and South China has been well-known (Youkai, et al., 2005).

Comment [D13]: Delete initials of author

Rumexacetosais commonly known as 'Sorrel' and this perennial plant is mainly distributed in eastern Asia, Europe, and America (Kato T. and Morita Y., 1990). This herb is used in food products with medicinal properties related to its tannin content (Vasas, et al., 2015). Previous studies reported that *Rumexacetosa* possessed antioxidant, anti-hypertensive, antiviral, and anticancer effects (Qamar, et al., 2011; Gescher, et al., 2011; Lee, et al., 2005).

Comment [D14]: Delete initials

CentellaAsiaticais popularly known as Gotu Kola, Asiatic pennywort, Indian pennywort or Spadeleaf and it comes from Apiaceae family. This herb has been used as vegetable in China, Southeast Asia, India, Sri Lanka, Oceania, and Africa from a long time period. This herb is traditionally used for the treatment of several diseases such as skin diseases, rheumatism,

inflammation, syphilis, mental illness, epilepsy, hysteria, dehydration, and diarrhea (Yu QL, *et al.*, 2006). In India, *Centellaasiaticais* used as medicine for trigger the memory and for skin diseases and nerve related disorder treatment (Jamil, *et al.*, 2007), In China, it is indigenously called as Gotu kola, and over 2000 years ago, it was one of the well-known as “miracle elixirs of life”(Diwan, *et al.*, 1991).

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In this study, the herbi dumpling can be defined as a final product obtained by ragi flour, corn flour sugar, Dehydrated Carrot powder, dehydrated pea powder, Eryngiumfoetidum powder, Rumexacetosa powder, CentellaAsiatica powder, and salt (Taynath, 2018). Herbi dumpling preparations should be analyzed the proximate composition, minerals, micronutrients and the influence of processing on the nutritional functionality. Hence, the information generated in the present investigation will be useful for their certification as quality food for consumers. The rising demands of users for healthy and nutritious food have encouraged the researchers to develop value added food products (Tiwari, A. and Mishra, S., 2018; Mishra, V. and Mishra, S. 2020). Hence, this study focuses on preparation of herbidumbling as a final product using ragi flour, corn flour, dehydrated Carrot powder, dehydrated pea powder, Eryngiumfoetidum powder, Rumexacetosa powder, CentellaAsiatica powder, and salt (Taynath, 2018). Herbi dumpling preparations should be analyzed for proximate composition Minerals and micronutrients for their certification as quality food for consumers.

Comment [D17]: by what process /unit of operation? Example “blending, mixing, etc

Comment [D18]: recast to make the meaning clear and technical.

Comment [D19]: How many products are being considered here?

Comment [D20]: Delete the initials

Comment [D21]: recast

Material andMethod

The present investigation was carried out in the Department of Food Science and Nutrition, School for Home Science, BabasahebBhimraoAmbedkar University, A Central University, Lucknow, Uttar Pradesh, India. The proximate analyses were carried out in triplicates and the results obtained were the average values. The estimation of the various food parameters in herbi dumplings was carried out using the methods of AOAC (1990). Protein was determined as Kjeldahl nitrogen x 6.25. Carbohydrate (nitrogen-free extract) contents were calculated by the differencemethod.

Comment [D22]: sub- heading: Materialsand Ingredients Collection

Preparation of Herbi Dumplings

Comment [D23]: 1

Tools: Dehydrator, Mixer and grinder, Weighing machine, Measuring spoon, Steam box, Gas stove and Packaging bags.

Comment [D24]: Tools should be under material collection

Collection of Ingredients: The herbs *Eryngiumfoetidum*, *Rumexacetosa*, *CentellaAsiatica* leaf collected from market located in Guwahati. Ragi flour, corn flour, carrot and peas are purchased from market in Lucknow.

Preparation of leaf powder of herbs: Collect fresh *Eryngiumfoetidum*, *Rumexacetosa*, *CentellaAsiatica* leaves, processed to remove dirt and another field damaged portion. The clean and fresh leaves dried in dehydrator at 35°C for 8 hours. Collect all dried leaves were ground into powder in a grinder.

Preparation of HerbiDumplings : Collect all the ingredients and mixed it. Add water and knead into soft dough and divide the dough into equal portion and roll out each portion into a round and filled with grind vegetables. Heat a steamer and steamed each herbi dumplings on a slow flame for 10 to 15minutes.

Comment [D25]: Should be under material and Ingredient collection

Comment [D26]: Who will do the collection for you?

Comment [D27]: What type of processing? Is it washing or sorting or both?

Comment [D28]: ?

Comment [D29]: Recast the whole sentences using appropriate reported speech.

Comment [D30]: This heading appeared two times see 1 above

Comment [D31]: 1)Recast using reporting speech
Example: All the ingredients were mixed with water and kneaded into soft dough - -
-
2)Was water addition done once or intermittently during the mixing to form desired dough consistency?
3)How was the mixing done, manually or mechanically?

Table.1. Ingredients of herbi dumplings

S.No.	Ingredients	Amount (in gm)
1.	Ragi flour (Finger millets)	200 gm
2.	Corn flour	200 gm
3.	Dehydrated Carrot powder	20 gm
4.	Dehydrated pea powder	20 gm
5.	<i>Eryngiumfoetidum</i> powder	10 gm
6.	<i>Rumexacetosa</i> powder	20 gm
7.	<i>CentellaAsiatica</i> powder	20 gm
8.	Salt	According to taste

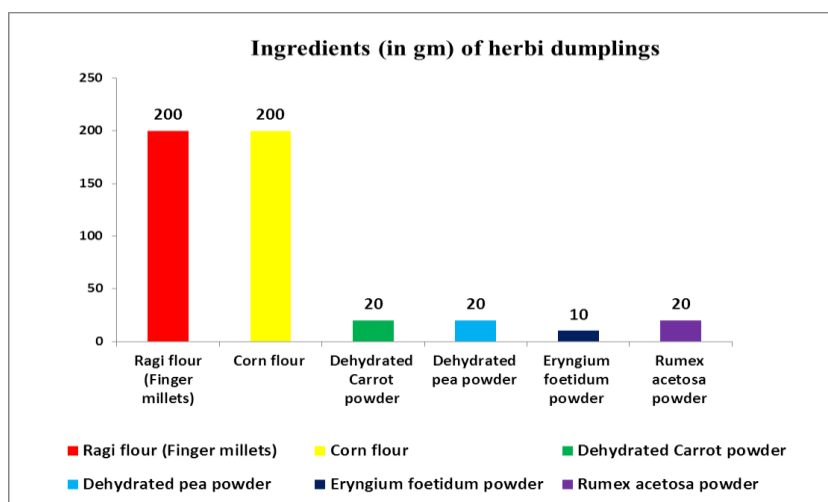


Figure.1. Ingredients of herbi dumplings

Comment [D32]: 1)a datum should not be presented in a Table and as a Figure in the same workie Table 1 and Figure 1 are the same information
2)Since the information is on the ingredients, Table should be appropriate.

Packaging: Food packaging is the most important and reliable process is necessary for food containment. This is the common method to safely control and protect the food against physical, chemical, biological and environmental factors. Aseptic packaging was used for the packaging of final product of herbidumpling in the form of flour. It is a well-accepted packaging method for the preservation of liquid and particulate foods. It is a type of thermal sterilization. It is a method in which commercially sterilized food product is placed in a sterilized packet and seal under aseptic environment. It is highly recommended for the preservation of fruit juices, tomato paste and food products. Paper and plastic are commonly used in aseptic packaging. Apart from this, foil wrap, plastic bags, metal cans & bottles, and various metal containers are used in aseptic packaging.

Comment [D33]: delete

Comment [D34]: Is it "dumpling" or "dumpling"?

Comment [D35]: 1) You talked generally on packaging, what type of aseptic packaging did you use in this work?
2) 'It' appeared four times here. Could you use appropriate conjunction to join the sentences

Result and Discussion

Proximate Composition

The result and discussion of the study are based on quality and sensory evaluation of herbi dumplings. Table 2 presents proximate composition of the herbi dumplings. The moisture content of herbi dumpling is 7.99 % and it can be stored for long time without spoilage. The value of 3.11 in herbi dumpling is considered appropriate, because it aids absorption of glucose, poison, fat and also increase fecal sample. The crude lipid content obtained for herbi dumplings was 1.12 %. Ash content of 2.49 % was obtained as a result for herbi dumpling. Crude fibre in food is an indication of the level of non-digestible carbohydrate and lignin. The crude protein of herbi dumpling is 11.32%. The carbohydrate content of herbi dumpling was 79.44%. The product is a good source of carbohydrate. The caloric value of herbi dumpling was 354.54 kcal/g. An average person requires 2000-3000 kcal per day (Jones et al., 1985). Herbi dumpling as a food fulfills the caloric requirement of the body.

Comment [D36]: Did you carry out sensory evaluation? It is not reported as one of the analysis done

Comment [D37]: Do not start a sentence in result discussion with 'Table 2'

Comment [D38]: What does "the value of 3.11" stand for?

Comment [D39]: How does the value of 3.11 in herbidumpling - - - aid the absorption of glucose, poison, - - - fecal sample?

Comment [D40]: Replace with: "The crude lipid and ash contents obtained for herbi dumpling were 1.12% and 2.49% respectively.

Comment [D41]: was

Comment [D42]: Replace with 'while'

Comment [D43]: delete

Comment [D44]: product

Comment [D45]: If average caloric requirement is 2000-3000kcal/day and herbi dumpling gave 354.54kcal/g, did it meet this need? How much of it will be taken to meet the caloric need/day?

Comment [D46]: Table 2 and the Bar Chart below have the same information. Choose the table or the bar chart and title it well

Table.2 Proximate Composition of HerbiDumpling

S. No.	Component	Value
1.	Moisture	7.99%
2.	Crude Fibre	3.11%
3.	Crude Fat	1.12%
4.	Ash	2.49%
5.	Crude Protein	11.32%
6.	Carbohydrates	79.44%
7.	Energy (Kcal.)	354.54(Kcal.)

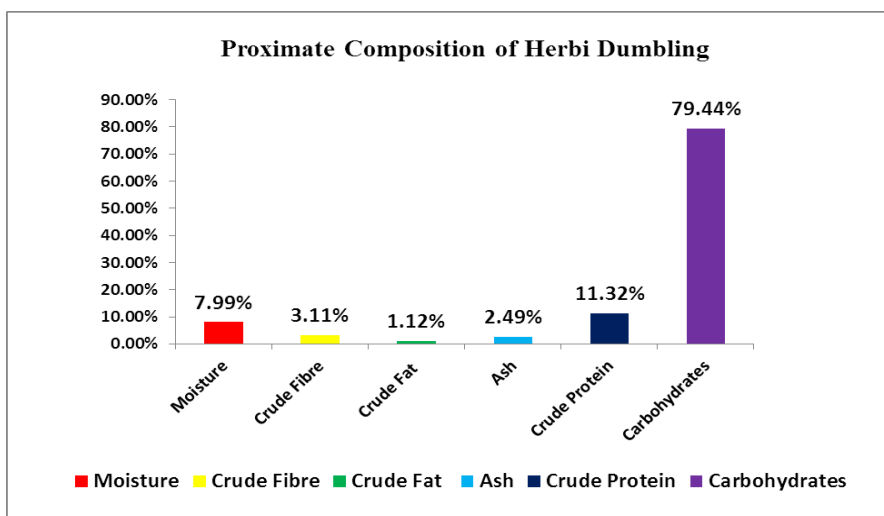


Figure.2. Micro Nutrients of HerbiDumbling

Table 3 presents the result of minerals and micro nutrients of herbi dumpling in mg/kg dry matter. The sodium content was 5.89 mg/g. The potassium content was 8.19 mg/g. The value obtained for calcium was 6.19 mg/g. The iron content was 1.09 mg/g. The manganese content was 0.52mg/g and copper content was 0.10 mg/g.

Comment [D47]: ?

Comment [D48]: Do not start a sentence with "Table 3"

Comment [D49]: Replace with "The values obtained for the macro minerals and micro nutrient were 5.89mg/g (sodium), 8.19mg/g (potassium) etc."

Table 3 Macro Minerals and Micro Nutrients of HerbiDumbling

S. No.	Macro Minerals and Micro Nutrients	Concentration mg/g
1.	Sodium	5.89
2.	Potassium	8.19
3.	Calcium	6.19
4.	Iron	1.09
5.	Manganese	0.52
6.	Copper	0.10

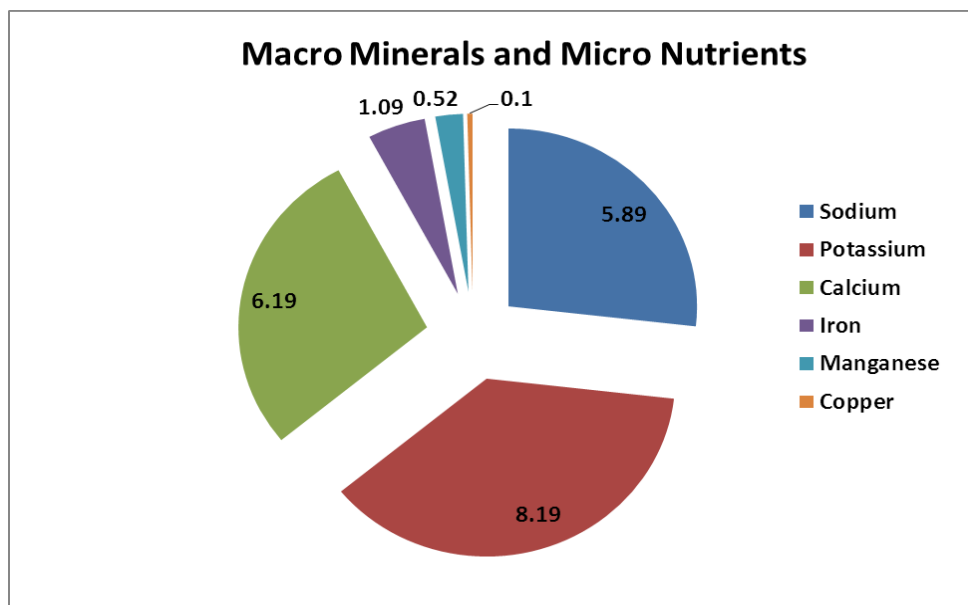


Figure.3. Macro Minerals and Micro Nutrients of Herbi Dumplings

Comment [D50]: A datum is presented twice again (Table 3 and Figure 3), choose one.

Conclusion

In the present investigation attempts have been made to study of finger millet herbi dumpling for proximate composition minerals and micronutrients content. The result of the study shows that the incorporation of ragi flour is found to be most acceptable to obtain herbi dumplings with improved nutritional value and health benefits. In present study the efforts are made towards the nourishment of herbi dumplings with ragi flour can be more beneficial for several disease such as anaemia, diabetes, brittle bones, osteoporosis and also increase bone strength.

Comment [D51]: No comparison test was conducted, no control sample and no sensory evaluation was carried out, so how did you prove that incorporation of ragi flour was found to be "most acceptable"?

Comment [D52]: enrichment

Recommendation

1. This product can be useful for diabetes and obese patients as well as growing children.
2. The herbi dumplings cheap in cost and easy to prepare so it can be used daily to fulfill the requirements of nutrients.

Comment [D53]: Recommendation in a research is for further work on areas not covered .

References

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Comment [D54]: Cited as single author Taynath 2018 in text

Comment [D55]: Cited as Verma et al 2013 in text

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Comment [D56]: No date in text

Comment [D57]: Not cited in text

Comment [D58]: Not cited in text

Comment [D59]: Cited as *Culantro*, 1999 in text

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Comment [D60]: Cited in text but not referenced

