

EVALUATION OF NUTRITIVE VALUE OF KUSHMANDA AVALEHA

Adhave Swati Sheshrao^{1*}, Ingole Rajesh Kundlikrao², Lagad Chatraguna Eknathrao³,
Gandhi Piyush Krantikumar⁴

¹PG Scholar, ²Professor and HOD, ³Professor, ⁴Assistant Professor,
Department of Rasashastra and Bhaishajya Kalpana, Government Ayurved College Nanded, Maharashtra, India

Email: adhaveswati25@gmail.com

ABSTRACT

Concept of Nutraceuticals and *Ayurvedic* principles of *ahara* emphasizes that food which not only provides nutrition but also helpful to prevent disease and maintain the healthy status is balanced food. *Ayurveda* is having number of dosage forms, where *ahara dravyas* has been used i.e. *pathya kalpana* etc. *Kushmanda Avaleha* is recommended as *Rasayana*. Hence it is used for *pittaja prakruti* and also useful in summer season, which is having dominancy of *pitta*. This work has been done to evaluate the nutritive value of *kushmanda avaleha*. It has been prepared as per reference given in classical text of *Sharangdhar Samhita*. Percentage of Carbohydrate, Protein, and other elements (Sodium, Zinc) in *Kushmanda avaleha* is evaluated. *Kushmanda Avaleha* contains 4.44 % of fats, 1.05% of proteins, 82.10% of carbohydrates, 60mg/100gm of sodium and 11mg/100gm of zinc which provides 372Kcals/100gm energy to the body.

Keywords: Nutraceuticals, Dietary supplements, carbohydrates, protein, fat

INTRODUCTION

Ayurveda mentioned five basic *kalpana* which are called as *panchvidha kashya kalpana*. *Panchvidh kashya kalpana* has several drawbacks such as less palatability, shorter shelf life. Hence to overcome these drawbacks, secondary formulations were developed. *Avaleha kalpana*, a secondary formulation¹ developed by using primary formulations like *swarasa* (Juice), *Kwatha* (Decoctions). *Avaleha* formulations prepared by using herbal medicinal drugs and food articles like sugar, *ghee* (Clarified Butter), honey.² Nowadays nutraceuticals has been considered as part of food that provides health benefits with prevention and treatment of diseases.³ *Kushmanda avaleha* is

polyherbal *ayurvedic* formulation in semisolid state. *Kushmanda* is rich source of carbohydrates. It is nourishing medicine also used in respiratory condition such as *kasa*, *shwasa* and to improve immunity and strength. Main ingredient of *Kushmanda Avaleha* is *kushmanda* which is also known as ash gourd, white pumpkin etc. Its chemical constituents are proteins, mucins, mineral salts, starch, calcium, vit.B, vit. C. In *ayurveda* there are some preparations like *avaleha*, *ksheerpaka*, *pathya kalpana* can be compared with nutraceuticals.

Dr. Stephan De Felice coined the term nutraceuticals which means (Nutrition and pharmaceu-

tics=nutraceuticals) in 1989⁴. The nutritional treatment is a system using dietary therapeutics and nutraceuticals as complementary therapy this treatment is based on belief that foods can not only be source of nutrients and energy but could also provide medicinal benefit.³ These preparations provide adequate amount of vitamins, fat, carbohydrates proteins etc. needed for better health. So these preparations can be used by young as well as old people, alike as a medicine as well as a food supplement.

Materials and Method:

Table 1: Ingredients of *Kushmanda avaleha*

English name	Latin name	Quantity in kg/ gm
Ash gourd	<i>Benincasa hispida</i>	2 kg
Water	-	4 L
Clarified butter	-	154gm
Sugar	-	2 kg
Long pepper	<i>Piper lonum</i>	38.5gm
Zinger	<i>Zinziber officinale</i>	38.5gm
Cumin seeds	<i>Cuminum cyminum</i>	38.5gm
Coriander seeds	<i>Coriandrum sativum</i>	9.6gm
Malabar leaf	<i>Cinnamomum tamala</i>	9.6gm
Cardamom	<i>Elettaria cardamomum</i>	9.6gm
Black pepper	<i>Piper nigrum</i>	9.6gm
Bark cinnamon	<i>Cinnamomum verum</i>	9.6gm
Honey	-	77gm

Preparation of *Kushmanda avaleha*⁵:

Kushmanda avaleha was prepared by as per *sharangdhar samhita*. *Kushmanda* or white pumpkin collected from local market. Outer skin of the *kushmanda* was removed, then cut it into small pieces & boiled with 4 parts of water. Then well-boiled pulp was strained through a clean dry cloth and remaining liquid part was separated. Paste was fried with *ghruta* till it becomes brown in color. Fried paste of white pumpkin was added to mixture of sugar and separated liquid. The mild heat was applied till desired appearance of *paka siddhi lakshana*. (Appearance of three threads when drop of above mixture kept in between thumb and index finger). Lastly *prakshepa dravyas* were mixed in above mixture in lukewarm stage. Once *avaleha* achieves room temperature, honey was added and then mixed uniformly.

Ayurvedic principles of *ahara* can be correlated with the properties of dietics and nutraceuticals that include antioxidants, digestive stimulants, probiotics etc. which are very important. With the help of *ayurveda* we can fill up the gap between food and medicine. *Ayurveda* has different concepts related to *ahara* that plays an important role in the prevention of disease and to enhance the immunity. Hence this study was selected to evaluate the nutritional value of *kushmanda avaleha*.

Estimation of Carbohydrate⁶: Test solutions (*kushmanda Avaleha* preparation) 10 gm of sample taken in volumetric flask and 20 ml of 2N H₂SO₄ & 20 ml of water was added to it; hydrolyzed for 2 hrs by boiling on water bath. After cooling, neutralized with 1N NaOH and made it 200 ml with water.

Standard solution (Dextrose solution - 250 mg of dextrose anhydrase dissolved in water to make the volume 100 ml.

Titration- 25 ml of Benedict's solution was taken, 1-2 gm sodium bicarbonate added and titrated with test and standard solutions respectively and the reading was noted.

% carbohydrates = $\frac{\text{Std reading} \times 2.5 \times 200 \times 100}{\text{Test reading} \times \text{Test wt.} \times 1000}$

Estimation of Protein⁷: After gone through digestion and distillation procedures, titration of samples was

carried out. 2-3 drops of phenolphthalein indicator was added to sample and titrated against 0.1N NaOH solution till the pink color obtained. Burette reading was noted.

Conversion factor- 1 ml of 0.1N NH₃ → 0.0014 g of Nitrogen
 % of N₂ × 6.25 → % of protein

Estimation of Fat⁸: Weight of dry round bottom flask of 250 ml capacity with 2-3 porcelain beads was done. Accurately weighed 3 gram sample was kept in a thimble and fat free cotton wool was kept on the mouth of thimble. Thimble was kept in Soxhlet apparatus at 60-80^o C Petroleum ether up to 1 complete siphon. The R.B. flask was heated gently till cycling of ether for 5-6 siphons gets completed. After disassembling the assembly, R.B. flask was placed in oven at 105 degree for 3-4 hours to evaporate the ether completely.

Calculation of Energy⁹: Energy from per gram protein, carbohydrate and fat is calculated by multiplying with 4, 4 and 9 respectively. Total energy is calculated by addition of the energy getting from carbohydrate, protein and fat.

Estimation of Sodium¹⁰:

Determination of sodium was done by flame photometry method. Firstly photometer was calibrated using standard solutions, and then diluted sample solution was allowed to pass through photometer. When a par-

ticular color of flame appeared, galvanometer reading was noted. Same procedure was repeated during both samples. From the above values, sodium readings in the undiluted samples were calculated.

Estimation of zinc¹¹:

Firstly zinc standard solution i.e. stock and working solution had been prepared. A test acid has been collected for the measurement of zinc by AA and then sample has been prepared by mixing, blending or grinding. After dry ashing accurately weighted sample kept in to clean petry dish as represented sample that was used to estimate the contain 25-100µg zinc. Char under the IR lamp ash heated at temperature ≤ 525°C until it get free from carbon. Prepared ash had been dissolved with minimum volume HCL (1+1). Then 20 mL of H₂O has been evaporated up to steam bath get dried. 20mL of 0.1N HCL has added and heated continuously for 5 min. That was filtered through fast paper in to volumetric flask. After that dish was washed with 5-10 mL of 0.1 HCL, cool and diluted with 0.1N HCL, this procedure had done till it attains working range of instrument. Instrument has been calibrated per instructions. Then 2 readings have been taken and burner was flushed with water and 0 point between readings was checked. Zinc content was determined by plotting standard curve against the µg Zn/mL.

$$\text{ppm Zn} = [(\mu\text{g Zn/mL from curve}) \times \text{diln factor, mL}]/ \text{g sample}$$

Results –

Table 2: Nutritive values of *kushamanda Avaleha* –

Constituents	Values/100gm	Constituents	Values/100gm
Carbohydrates	82.10	Total energy	372.56 kcals
Protein	1.05	Sodium	60 mg
Fat	4.44	Zinc	11 mg

DISCUSSION

Balanced diet is defined as one which provides all the nutrients in required amount and proper proportions of proteins, vitamins, minerals, fats, carbohydrate and other nutrients important for health and well being¹². *Kushmanda avaleha* provides total energy 372.56

kcal/100g to the body, out of this maximum part of energy (328.4 kcals) comes from 82 % of carbohydrate present in it. The recommended intake of carbohydrate in the balanced diet is 50-80 percent of total energy intake¹³. Carbohydrate acts as instant energy

supplier and also essential for body function mainly nervous tissue function¹⁴.

Kushmanda Avaleha contains 1.05 g/100 g of protein, which provide 4.2 kcals energy. The daily requirement of protein is 0.83g/kg/d it gives 39 kcals/kg/d¹⁵. Mainly Protein act as building blocks or for repair or maintains of body tissues. Occasionally they act as source of energy by providing 4 kcal per one gram.¹⁵ *Kushmanda avaleha* contain 4.44 percentage of fat which can provides near about 39.96 kcals of energy. The minimum intake of fat ranges between 20-40g/day¹⁶. So *kushmanada avaleha* provides only 10 to 20 % of daily intake of fat.

Some minerals especially the macro minerals are important as electrolytes. These minerals regulate nerve and muscle function and maintain acid-base balance and water balance¹⁷. Heat stroke is the condition in which internal temperature of the body rises over 41⁰C as result of high body temperature, which cause fatigue, headache, dry skin, absence of sweating¹⁸. Sodium lost from body through urine and sweat, that which is passed out in urine is regulated by the kidney but that which lost by sweating is not controlled. To prevent these symptoms body needs replenishment of electrolytes¹⁹. Sodium (60mg/100gm) and zinc 11mg/100gm present in *Kushmanda Avaleha* may act as preventive to replenish the loss of sodium which occurs due to excessive sweating.

Zinc deficiency is common in children from developing countries due to lack of intake of animal food, high dietary phytate content, inadequate food intake. Suggested daily intake for adults is 12 mg per day for men, 10 mg for women and 10 mg per day for children. Adequate zinc intake is essential for maintaining the integrity of immune system. Zinc affects multiple aspects of the immune system, from the barrier of the skin to gene regulations within lymphocytes. Zinc plays an important role as antioxidant agent. Daily intake of *Kushmanda avaleha* in 40 gm provides 4.4 mg of zinc daily, which provide adequate amount of zinc²⁰.

Medhyarasayana drugs are used for the prevention and treatment of mental disorders. *Kushmanda* is described in *ayurveda* as *medhya* drug, *kushmanda* con-

trols *vata pitta dosha* and its *prabhava* is *medhya*²¹. *Kushmanda Avaleha* is very useful in treatment of nervous system disorder due to its *medhya* property. *Kushmanda* is widely used for the treatment of *amlapitta* due to its *pittashamak* property²².

Recent studies proves that extract of *kushmanda* prevent development of experimental ulcers. Study showed extract of *kushmanda* may be a natural drug with antiulcer activity²³. *Kushmanda Avaleha* provides strength and reduces aggravated *pitta* symptoms including burning sensation, acid reflux, hyperacidity and headache occurring during burning sensation is treatable by *kushmanda avaleha*. It soothes the stomach linings modulates the gastric secretion, which helps to reduce pungency and sharpness of gastric secretions. It gives relief from above all conditions related to *amlapitta*.

CONCLUSION

Kushmanda avleha is beneficial for both young and old age group. It is used as an *ayurvedic* supplement that provides strength, nourishment to the body, enhances the immunity. *Kushmanda avaleha* contain high percentage of carbohydrates hence it plays an important role in nervous system. Its *medhya prabhava* described in *Ayurveda* so it can be best solution for mental disorders and Sodium present in it also helps to reduce excess of heat and elevated *pitta* in body.

REFERENCES

1. Dr. Reddy K.R, Aushadhi Kalpana Bhaisajya kalpana Vijnanam, Varanasi,Chaukhambha Sanskrit Bhavan, 1998, p.209.
2. Sharangdhar, Madhyam Khanda 8/1-3 Sharangdhar Samhita commentary with Dipika and Gudhartha dipika Commentary,4th Ed, Varanasi, Chaukhamba Orientalia,;2000 p 206
3. Chavan B, Kumar G, Kalam N. Current concepts and projects of herbal nutraceutical: A Review, J.Adv Pharm Technol Res.2013 jan-march;4(1):4-8 Wolters Kluwer—Medknow publications
4. Arun R et.al, Nutraceutical Applications in Ayurvedic Dietics and nutrition, International Ayurvedic Medical Journal review article Vol.4; 2016

5. Sharangdhar, Madhyam khanda 8/22-28 Sharangdhar samhita Dipika and Gudhartha dipika commentary, 4th Ed, Varanasi chaukhamba orientalia, 2000 p 209
6. Association of Official Analytical Chemists ch 4th/ Animal feed, In.Official Methods of Analysis-Volume 1st,15th Ed 1990, Virginia USA, Published by association of Official Analytical Chemist, INC 1990 Wilson Boulevard Arlington p83
7. Association of Official Analytical Chemists ch 4th/ Animal feed, In.Official Methods of Analysis-Volume 1st,15th Ed 1990, Virginia USA, Published by association of Official Analytical Chemist, INC 1990 Wilson Boulevard Arlington p69
8. Association of Official Analytical Chemists ch 4th/ Animal feed, In.Official Methods of Analysis-Volume 1st,15th Ed 1990, Virginia USA, Published by association of Official Analytical Chemist, INC 1990 Wilson Boulevard Arlington p79
9. K. Park, Ch 11th Nutrition and Health, Textbook of Preventive and Social Medicine, 24th Ed, Jabalpur, M/s Banarsidas Bhanot publications jan2017 p.671
10. Association of Official Analytical Chemists ch 4th/ Animal feed, In.Official Methods of Analysis-Volume 1st,15th Ed 1990, Virginia USA, Published by association of Official Analytical Chemist, INC 1990 Wilson Boulevard Arlington p.33
11. Association of Official Analytical Chemists ch 4th/ Animal feed, In. Official Methods of Analysis-Volume 1st,15th Ed 1990, Virginia USA, Published by association of Official Analytical Chemist, INC 1990 Wilson Boulevard Arlington p.237
12. K. Park, Ch 11th Nutrition and Health, Textbook of Preventive and Social Medicine, 24th Ed, Jabalpur, M/s Banarsidas Bhanot publications jan2017 p.675
13. K. Park, Ch 11th Nutrition and Health, Textbook of Preventive and Social Medicine, 24th Ed, Jabalpur, M/s Banarsidas Bhanot publications jan2017 p.674
14. What's function carbohydrate? Reviewed by Debra Sullivan,September 22, 2017 written by Erica Hersh [Accessed 7/04/2019] Available from: <https://www.healthline.com>
15. K. Park, Ch 11th Nutrition and Health, Textbook of Preventive and Social Medicine, 24th Ed, Jabalpur, M/s Banarsidas Bhanot publications jan2017 p.647
16. K. Park, Ch 11th Nutrition and Health, Textbook of Preventive and Social Medicine, 24th Ed, Jabalpur, M/s Banarsi Responses to Injury, Heat stroke das Bhanot publications jan2017 p.651
17. Larry e. Johnson, Overview of minerals university of Arkansas for medical science . Merck manual professional version, [www. Merckmanuals.com](http://www.Merckmanuals.com), [Accessed on date 11/04/2019]
18. A.C. Ritchie, ch 7th Boyd's Textbook of Pathology,General vol. 1 9th edition lea & febiger philadelphia/ London 1990 P.569
19. K. Park, Ch 11th Nutrition and Health, Textbook of Preventive and Social Medicine, 24th Ed, Jabalpur, M/s Banarsidas Bhanot publications jan2017 p.660
20. K. Park, Ch 11th Nutrition and Health, Textbook of Preventive and Social Medicine, 24th Ed, Jabalpur, M/s Banarsidas Bhanot publications jan2017 p.663
21. Vruddha vagbhata, chikitsasthan 5/ 29, Ashtang Sangrah Indu commentary, shivprasad sharma, 1st Edition Chaukhamba Sanskrit series office Varanasi 2006 p. 457
22. Bhavmishra, Bhavaprakash Nighantu, K.C. Chunekar Commentary edited by G.S. Pandey shakavarga 37/53-55 Chaukhamba Bharati Acadmy Varanasi reprint 2006 p.676
23. J. K. Grover , G. Adiga , V. Vats, S.S. Rathi 'Extract of Benincasa Hispida prevent development of experimental ulcers' Journal of Ethnopharmacology , vol 78, Issues 2-3, Dec. 2001 p.159-164

Source of Support: Nil

Conflict Of Interest: None Declared

How to cite this URL: Adhave Swati Sheshrao et al: Evaluation Of Nutritive Value Of Kushmanda Avaleha. International Ayurvedic Medical Journal {online} 2019 {cited May, 2019} Available from: http://www.iamj.in/posts/images/upload/723_727.pdf