

A COMPREHENSIVE STUDY ON NUTRACEUTICAL FORMULATIONS WITH LODHRA POWDER FOR WOMEN HEALTH

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ABSTRACT

Introduction- One of the most significant therapeutic herbs in the Symplocaceae family is Lodhra (*Symplocos racemosa roxb*). It possesses several anti-inflammatory, anti-acne, anti-ulcer, antioxidant, and anti-diabetic qualities. It is widely used to treat a wide range of illnesses, including Alzheimer's, PCOS, leprosy, and many more. **Objective-** The purpose of this study was to develop nutraceutical products incorporating dehydrated Lodhra bark powder, such as Lodhra Powder Chyawanprash and Lodhra Orange Squash, and then assess their sensory and nutritional properties. **Method-** Along with control (T_0), three variations (treatments) of the lodhra powder Chyawanprash T_1 , T_2 , and T_3 were prepared, which contain 1g, 3 g, and 5g of lodhra powder, respectively. Along with control (T_0), five variations (treatments) of the lodhra orange squash (T_1 , T_2 , T_3 , T_4 and T_5) were prepared, which contain 1g, 2g, 3g, 4 g, and 5g of lodhra powder respectively. The sensory attributes of products were analysed organoleptically by the panel of judges using a 9-point hedonic scale score card. The nutritional composition of value-added products was calculated using AOAC 2020 standard procedure. **Result-** The lodhra powder product was more nutritious as the addition of lodhra powder increased the fiber content of the product. It can be concluded that the addition of lodhra powder adds a fragrance and taste, and it also enhances the quality of lodhra powder chyawanprash and lodhra orange squash. **Conclusion-** It was concluded that the addition of lodhra powder added therapeutic value for reducing leucorrhea and improving reproductive health in the female population. It also enhanced the quality of the prepared nutraceuticals.

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INTRODUCTION

One significant therapeutic herb is lodhra. It belongs to the Symplocaceae family and is known by its botanical name, *Symplocos racemosa roxb*. It is a little, ten to fifteen meter tall evergreen tree. They are mostly found in the Himalayan regions of north and east India. There are 300–500 species in the Symplococaceae family that belong to the genus *Symplocos*. India is home to about 68 species (1). Lodhra is renowned in Ayurveda for cleaning wounds, stopping bleeding, and starting the quick healing process. Because of its ability to arrest, it is also known as Rodhra. Lodhra bark has been used to treat digestive problems since it is astringent, digesting, and bitter (2).

A common Ayurvedic treatment for gynecological disorders is lodhra, which can be purchased individually or in multicomponent mixtures through the Indian System of Medicine (ISM). It helps with bleeding gums, spongy gums, and eye disorders. It

treats complaints related to the liver, leprosy, dropsy, and blood disorders (Kapha) (3, 4). It is an effective treatment for uterine irritation and cleansing (5).

The intricate interaction of hormones from the pituitary, ovaries, and hypothalamus regulates the female menstrual cycle. Follicle stimulating hormone (FSH) is responsible for the early growth of the primary follicle up to the antral stage and the increased production of progesterone. The hypothalamus is the actual center of control because it produces gonadotropin releasing hormone (GnRH), which stimulates the anterior pituitary to release gonadotropins. LH completes the maturation of FSH primed or recruited follicles. Atypical pituitary production of FSH and LH is linked to numerous reproductive anomalies (6, 7). It has wound-healing, anti-inflammatory, anti-diabetic, anti-cancer, and anti-ulcerative properties. Bark from *Symplocos racemosa* has been shown to possess hepatoprotective, analgesic, antioxidant, antibacterial, and anthelmintic properties.

REVIEW OF LITERATURE

The goal of the research, which was undertaken by Kamble et al. in 2023, is to develop and evaluate a multi-herbal face pack that can be used as cosmetics and only contains natural ingredients. We got Lodhra, Rakta Chandan, Haridra, Manjistha, and Multani mitti from the Dadar Pharmacy Ayurvedic store in Vashi, Navi Mumbai. These herbs were dehydrated, ground into a powder, put through a 100-mesh sieve, combined geometrically, and assessed chemically as well as organoleptic and physico-chemical properties, surface powder, and microscopical features. The blended dry powder had a good flow effect and would be useful in a face pack. The powder's particles were found to have sizes between 20 and 25 m. The dried powder's homogenized form's microscopical characteristics were recorded. Using a herbal face pack helps to preserve skin suppleness, improve blood circulation, revitalize muscles, and clear debris from pores on the skin. Herbal cosmetics have the advantage of being nontoxic, reducing allergic reactions, and having many of its constituents functionally proven throughout time. Therefore, while the current work demonstrated promising features for face packs, more investigation is needed to determine the practical advantages of face packs for usage as cosmetics on humans.(8)

Sharma et al, (2022) stated that our skin serves as both a protective covering for our entire body and a window into our physical and mental well-being. The most prevalent skin condition in teenagers, mukhdushika disfigures the face. Propionibacterium acnes is the primary cause of the chronic inflammatory condition known as acne vulgaris, which affects the pilosebaceous follicles. It has a connection to the Ayurvedic disease Mukhdushika. The main factor causing illness and disease-related mortality is microbial infections. Antibiotic-resistant bacterial strains are a serious concern when antibiotics are taken carelessly. Antimicrobial resistance (AMR) poses a threat to the ability of medical professionals worldwide to effectively treat infectious diseases. Pseudomonas aeruginosa, a gram-negative skin pathogen, is one of the most prevalent and has a high rate of antibiotic resistance. Staphylococcus aureus is another common skin pathogen (9).

According to a study by Santra et al. (2022), lodhra (Symplocos recemosa Roxb) is a significant medicinal plant that is used to treat bleeding disorders, diarrhea, dysentery, conjunctivitis, and inflammation. It is also mentioned in Ayurvedic classics and Nighantus. This drug's useful part is the stem bark. A Pittaprokapak and Raktaprodushak vyadhi is bleeding disorder. Pittadushita Rakta leaves the body through both large

and small openings, including the mouth, nose, eyes, ears, urinary tract, anus, and vagina. Overconsumption of manasik hetu, vihara, and pitta prokopa ahara caused the development of this clinical condition. Using Sodhana, Sama, and Nidan Paribarjan rationally is the first step in treating this fatal illness. (10).

Nath et al, (2022) stated that Ayurveda is a long-established, conventional medical system. In Ayurveda, long, healthy lives are encouraged and unnecessary pain is avoided. Ayurveda uses natural ingredients to create potential medications that are thought to get rid of the diseases' underlying causes. India's subcontinent is one of the world's largest biodiversity hotspots with 45 000 plant species. 7500 of the 15,000 reported medicinal plant species in India are used by local populations to treat a variety of illnesses. Single or multiple herbs are used in Ayurveda treatments. Various formulations, including fermented formulations like arishtas and asavas, are prepared in these traditional medical systems. These formulations, which contain self-generated alcohol, are made using a decoction of herbal medicines (11).

MATERIALS AND METHODS

The present study entitled “**Development of Nutraceutical preparation with lodhra powder**” was conducted in the department of food and Nutrition, Era University, Lucknow.

PROCUREMENT OF RAW MATERIAL

LODHRA BARK- Lodhra barks were collected from local market of Lucknow city.

RAW INGREDIENTS FOR LODHRA POWDER CHYAWANPRASH

S. No.	Name of Ingredient	Quantity
1.	Indian Gooseberry	100gram
2.	Ginger	5gram
3.	Ghee	6 ml.
4.	Mace spice	1 flower
5.	Jaggery	100gram
6.	Clave	1.6 gram
7.	Black paper	1.6 gram
8.	Cinnamon	0.4 gram
9.	Green Cardamom	0.4 gram
10.	Nutmeg	1 gram
11.	Clave	1 gram
12.	Bay leaf	0.4 gram
13.	Cumin	1 gram
14.	Water	400 ml

Table 1: All Ingredients were Purchased from Local Market and the Quantity is as Follows.

RAW INGREDIENTS FOR LODHRA POWDER ORANGE SQUASH

S.No.	Name Of Ingredient	Quantity
1.	Orange	400 grams
2.	Sugar	100 grams
3.	Orange gel color	2drops
4.	salt	0.3 gram

Table 2: Raw ingredients were purchased from local market and about 100 gm 4 variations were prepared

PREPARATION OF LODHRA POWDER CHYAWANPRASH

- Take 100gram Indian Gooseberry / Amla and washed it.
- Pour amla and 1 cup of water into a pressure cooker.
- Pressure cooker for 3 whistles.
- Turn off the flame.
- Remove steam from the cooker and open.
- Take out in a bowl.
- Allow them to cool a bit and remove all seeds.
- Put the amla in a grinder jar.
- Grind it without water to get a smooth lumps free puree smooth consistency.
- Take a small grinder jar ginger, green cardamom, cinnamon, cumin black paper, mace flower, bay leaves, grind it to a very fine powder.
- Heat 6gram ghee in a pan add amla paste when the ghee is hot.
- Cook on low flame while stirring continuously.
- Cook for 1 hour until thickened (ghee is seen separated when the amla is roasted), strain the ¼ the remaining decoction and boil until it remains half then add jaggery and cook it like syrup.
- After the syrup thickens add the amla pulp and cook till it becomes a uniform mixture. Powder mixed it in syrup.
- Let the chyawanprash cool to room temperature and store it in an airtight container.

The lodhra powder chywanprash were developed with incorporating lodhra powder at different variations (1 gram, 3gram, 5gram, respectively). For product formulation following procedure was followed. One serving of lodhra chyawanprash was comprised of 15gm.

T₀- Control no incorporation of lodhra powder

T₁- lodhra powder 1gm. & chyawanprash

T₂- lodhra powder 3gm. & chyawanprash

T₃- lodhra powder 5 gm. & chyawanprash

PREPARATION OF LODHRA ORANGE SQUASH

- Take 400gram orange washed it. and remove the peel of the orange.
- blend using pulse made. Pulse it 2 time.
- Using strainer, strain the orange juice.
- 2 drop orange gel color, mix well. Remove orange zest and add in orange juice avoid white part.
- 100gram sugar in big plate.
- 125 ml orange juice.
- Dry the sugar in shade and not in sunlight.
- After 2 days sugar has dried up. Spread sugar evenly and again dry for 6 more days.
- Total 7 days the sugar has dried up check it this way.
- Remove the sugar from plate.
- Add the sugar in blender jar add salt.
- Blend and make powder.

The lodhra orange squash were developed with incorporating lodhra powder at different variations (1gram, 2gram, 3gram, 4gram & 5gram, respectively). For product formulation following procedure was followed.

T₀- control No incorporation of lodhra powder

T₁- lodhra powder 1 gm. & squash 5gm.

T₂- lodhra powder 2gm. & Squash 4gm.

T₃- lodhra powder 3gm. & squash 3gm.

T₄- lodhra powder 4gm. & Squash 2gm.

T₅- lodhra powder 5 gm. & squash 1gm.

STATISTICAL ANALYSIS

Appropriate statistical techniques were adopted to analyse the data. The data provides the acceptability of products which was analysed by panel member.

RESULTS

The nutraceutical food products like lodhra powder Chayawanprash, Lodhra orange squash, were prepared using lodhra bark powder, in different doses (1gram - 5 gram) respectively. The nutraceutical food product was subjected for sensory evaluation by expert panel members from the Department of Food and Nutrition with the help of 9-point hedonic scale. The results from the analysis as follows:

Table 4.1 & figure 4.1 shows the average sensory score

SENSORY ATTRIBUTE	COLOUR & APPEARANCE	TEXTURE	FLAVOUR	TASTE	OVERALL ACCEPTABILITY
Treatment	(Mean \pm Standard Deviation)				
T ₀	8.51 \pm 1.004	8.44 \pm 0.66	8.51 \pm 0.78	8.44 \pm 0.78	8.5 \pm 0.78
T ₁	7.75 \pm 0.91	7.86 \pm 0.83	7.7 \pm 0.83	7.93 \pm 0.75	7.86 \pm 0.69
T ₂	8.17 \pm 0.96	8 \pm 1.06	8.34 \pm 0.85	8.34 \pm 0.72	8.34 \pm 0.72
T ₃	6.89 \pm 0.81	7 \pm 0.83	6.96 \pm 1.01	7.06 \pm 1.16	6 \pm 0

Table 4.1 Average sensory score of nutraceuticals lodhra powder chayawanprash.

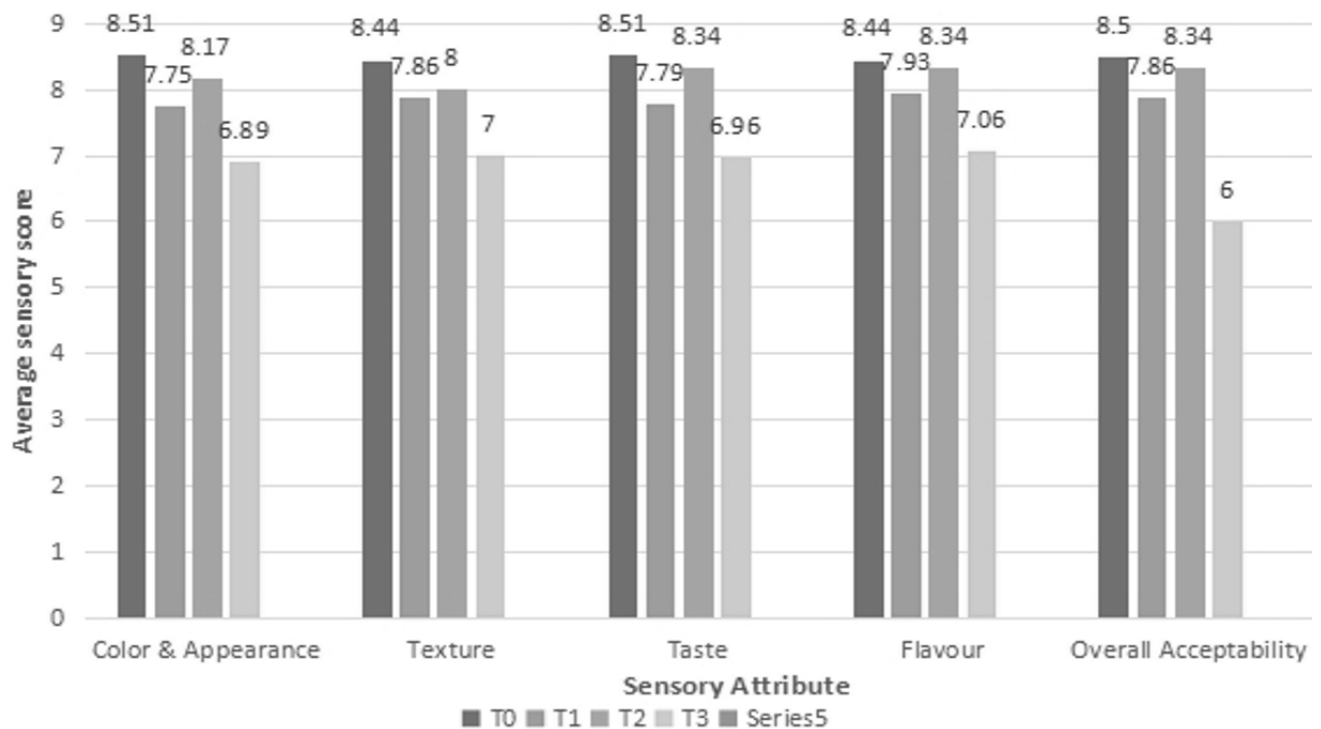


Fig. 4.1 Average sensory score of Lodhra Powder Chayawanprash

of different sensory attributes of lodhra powder Chayawanprash. All the products score high in the category of liked very much. When comparing the scores, it was clear from the table that the maximum scores were obtained by standard products T₀(8.51) for colour and appearance, (8.44)for texture,(8.51)for flavour, (8.44) for taste and (8.5)for overall acceptability. While comparing the treatment nutraceutical product with lodhra bark powder out of three variations maximum score were obtain by T₁ i.e.(7.75)for colour and appearance, (7.86)for texture,

(7.79)for flavour, (7.93)for taste, (7.86)for overall acceptability followed by T₂,(8.17)for colour and appearance,(8) for texture, (8.34)for flavour, (8.34) for taste,(8.34) for overall acceptability and by T₃, (6.89) for colour and appearance, (7) for texture,(6.96)for flavour, (7.06)for taste, (6)for overall acceptability respectively.

NUTRITIVE VALUE OF LODHRA POWDER CHAYAWANPRASH PER 100 gm

Table 4.3 depicts the average sensory score of different

Treatment	Energy (Kcal)	CHO (gm)	Protein (gm)	Fat (gm)	Ash	Moisture	Fiber (gm)
T ₀	343.11	74.21	1.0	4.81	6.25	18.54	7.72
T ₁	341.11	73.31	1.0	4.7	6.26	18.25	8.01
T ₂	339.95	73.21	1.0	4.79	6.27	18.30	8.92
T ₃	337.81	72.21	1.0	4.5	6.24	18.40	9.92

Table 4.2: Nutritive value of Lodhra Powder chayawanprash

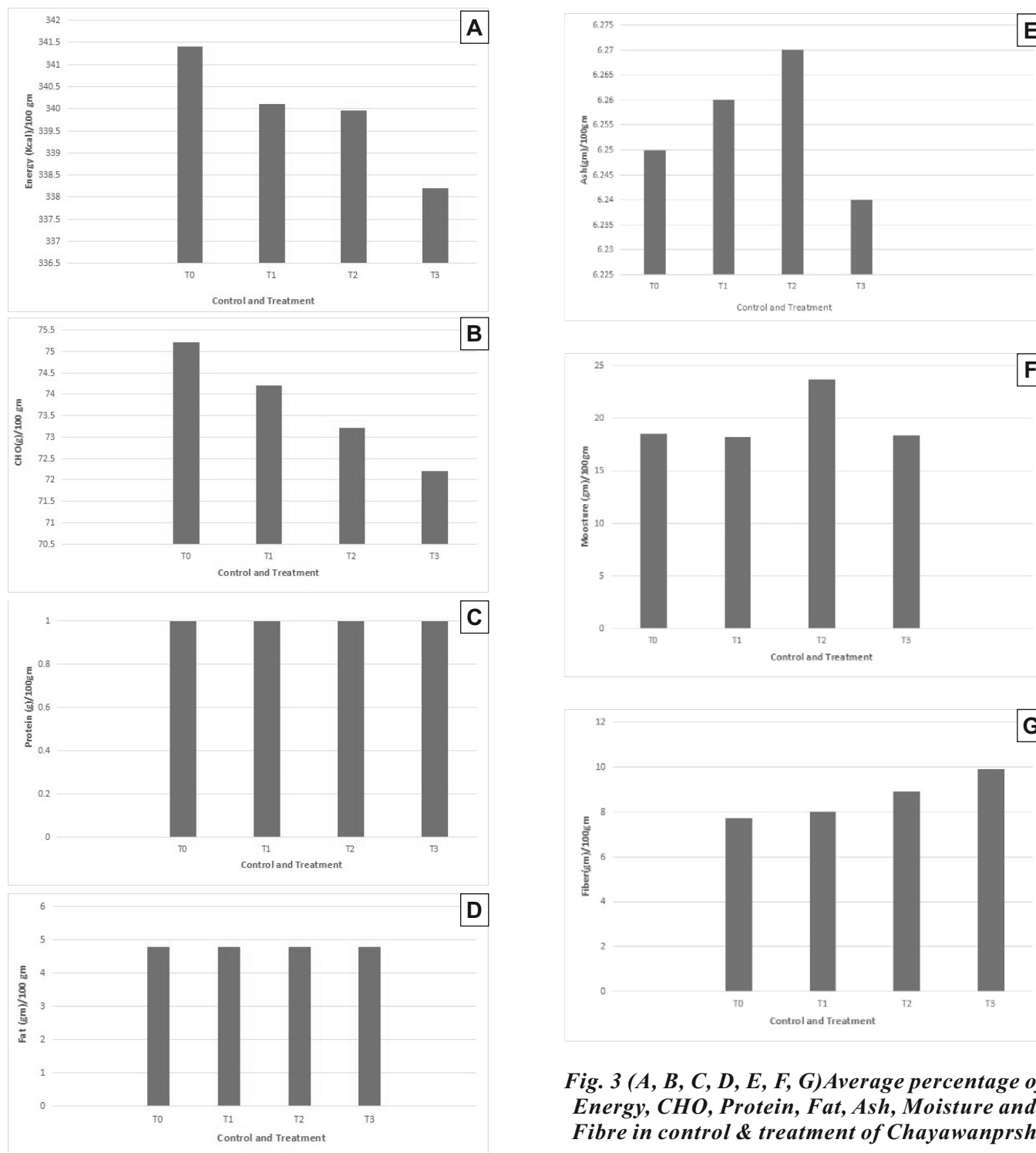


Fig. 3 (A, B, C, D, E, F, G) Average percentage of Energy, CHO, Protein, Fat, Ash, Moisture and Fibre in control & treatment of Chayawanprash

SENSORY EVALUATION PARAMETERS OF DEVELOPED LODHRA ORANGE SQUASH

SENSORY ATTRIBUTE	COLOUR & APPEARANCE	TEXTURE	TASTE	FLAVOUR	OVERALL ACCEPTABILITY
Treatment	(Mean Standard Deviation)				
T ₀	8.5±0.58	8.5±0.58	8.46±0.64	8.42±0.64	8.46±0.58
T ₁	7.53±0.58	7.55±0.57	7.55±0.63	7.44±0.73	7.5±0.63
T ₂	8.05±0.94	8.0±0.94	8.11±1.01	8.01±1.04	8.07±0.93
T ₃	6.31±1.13	6.61±1.13	6.61±1.17	6.4±1.15	6.57±1.08
T ₄	5.73±0.96	5.84±0.86	5.5±0.93	5.6±0.88	5.65±0.89
T ₅	4.76±0.86	4.76±0.81	4.69±0.78	4.84±0.67	4.80±0.69

Table 4.3 Average Sensory Score of Nutraceuticals Lodhra Orange Squash.

sensory attributes of lodhra orange squash. All the products score high in the category of liked very much. When comparing the scores, it was clear from the table that the maximum scores were obtained by standard products T₀(8.5) for colour and appearance, (8.5) for texture, (8.46) for flavour, (8.42) for taste and (8.46) for overall acceptability. While comparing the treatment nutraceutical product with lodhra bark powder out of three variations maximum score were obtained by T₁, i.e. (7.53) for colour and appearance, (7.55) for texture, (7.55) for flavour, (7.44) for taste, (7.5) for overall acceptability followed by T₂, (8.05) for colour and appearance, (8.0) for texture, (8.11) for flavour, (8.01) for taste, (8.07) for overall acceptability and by T₃, (6.31) for colour and appearance, (6.61) for texture, (6.61) for flavour, (6.4) for taste, (6.57) for overall acceptability respectively. T₄, (5.73) for colour and appearance, (5.84) for texture, (5.5) for flavour, (5.6) for taste, (5.65) for overall acceptability respectively. T₅, (4.76) for colour and appearance, (4.76) for texture, (4.69) for flavour, (4.84) for taste, (4.80) for overall acceptability respectively.

DISCUSSION

The present research work has been summarized here and it was concluded that nutraceutical preparation by incorporating lodhra powder like chywanprash and orange squash provides concentrated form of nutrients (Carbohydrate, Energy, Protein, Fat, Vitamin C and Crude fiber) in comparison to standard recipe. The lodhra powder product was more nutritious as the addition of lodhra powder increased fibre content of the products. The sensory parameters i.e., texture, Flavour and taste were highly accepted by consumers. According to sensory scores, the T₂ was the most acceptable among all the treatments.

CONCLUSION

It can be concluded that addition of lodhra powder adds a fragrance, taste and it also enhances the quality of the prepared nutraceuticals. Lodhra possesses antibacterial properties therefore, it stops the germs causing the vaginal infection from growing. In addition, it contains cooling, astringent, and anti-inflammatory qualities.

Treatment	Energy (Kcal)	CHO (gm)	Protein (gm)	Fat (gm)	Moisture (gm)	Fibre (gm)	Calcium (gm)	Iron (gm)
T ₀	401.9	100	0.20	0.1	0.99	6.50	9.0	9.0
T ₁	400.7	99	0.21	0.4	1.10	6.56	9.12	9.19
T ₂	400.6	98	0.21	0.5	0.25	7.01	9.14	9.17
T ₃	398.1	97	0.22	0.6	0.10	7.30	9.16	9.14
T ₄	398.1	96	0.23	0.7	0.10	6.70	9.11	9.18
T ₅	398.0	95	0.24	0.8	0.25	7.0	9.19	9.14

Table 4.3 Nutritive Value of Lodhra Orange Squash

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