



# INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

## Chyawan Musli:- A Powerful Herbal Formulation For Overall Health And Immunity.

1Sonali Mahadev Guthe, 2Prof. Gitesh V. Vyas, 3Dr. Sunil S. Jaybhaye, 4Ms. Ashwini Bahir

1Student , 2Asst. Professor , 3Principal , 4Professor

1Institute of pharmacy, Badnapur ,

2Institute of pharmacy, Badnapur ,

3Institute of pharmacy, Badnapur ,

4Institute of pharmacy, Badnapur

### Abstract:-

Chyawanprash is an ayurvedic health supplement which is made up of a super- concentrate blend of nutrient rich herbs and minerals. It is meant to restore drained reserves of life force and to preserve strength, Stamina, and vitality, while stalling the course of aging. Chyawanprash is formulated by f processing of many medical herbs.[1]

Safed musli is known for its roots and saponins components that are associated with various medicinal properties, In recent years, this plant has gained much popularity due to its economic value, In ayurvedic, Chlorophytum borivilianum belongs to the group of “ Vajikaran Rasayana” corroborated to its rejuvenating, aphrodisiac, natural sex tonic properties.[2]

### Keywords:-

- 1) Safed musli
- 2) Chyawanprash
- 3) Health benefits
- 4) Immunity booster

## 1. Introduction :-

*Chlorophytum borivilianum*, commonly known as Safed Musli, is a medicinal herb native to India. It belongs to the family Asparagaceae and is widely recognized in traditional Ayurvedic medicine for its various health benefits.[3] The plant is characterized by its slender, green leaves and small white flowers. Its roots are the most utilized part, known for their therapeutic properties, especially in improving sexual health, energy levels, and overall vitality.[4] The herb has been used for centuries to treat various ailments, such as fatigue, sexual dysfunction, and general debility. It is classified as an adaptogen, meaning it helps the body resist physical, chemical, and biological stressors. The roots of Safed Musli are rich in saponins, alkaloids, and other bioactive compounds that contribute to its medicinal properties, making it a popular choice in natural remedies aimed at enhancing male health and treating erectile dysfunction.[5] Studies have shown that *Chlorophytum borivilianum* has potential aphrodisiac effects, which may help address erectile dysfunction (ED) by boosting testosterone levels, improving blood circulation, and enhancing libido. The herb's natural composition promotes hormonal balance and supports the body's ability to recover from stress, both of which are important factors in sexual health.[6]

Chyawanprash, enriched with Safed Musli root, is a potent Ayurvedic formulation that combines the benefits of both ingredients to promote overall health, vitality, and immunity. This blend leverages the immune-boosting properties of Chyawanprash and the aphrodisiac, immunomodulatory effects of Safed Musli.

Chyawanprash is an Ayurvedic dietary health supplement used for boosting immunity and help in making a person feel young. Chyawanprash is one of the anti-ageing supplements, which is purely herbal in nature. It has Amla as its main ingredient, which is a powerful antioxidant. Master Charaka is the first to mention this herbal medicine. Ayurveda recommends the use of herbal supplements to help the increase immunity, restore drained reserves of life force and to preserve strength, stamina, and vitality, while stalling the course of aging. There are many benefits of chyawanprash. It is useful in cough and cold. It helps in the rejuvenation of the aged and also in proper nourishment of young ones. It is effectively used in the treatments of throat infections. Chyawanprash is formulated by processing around 50 medicinal herbs, minerals sugar, honey, Indian gooseberry jam, and spices. Chyawanprash market has seen a sharp rise of 30 to 40 percent in the period of rising cases of coronavirus. This article focused on immunity boosting herbal medicine in COVID-19 pandemic.

## 2. Need of research:-

### 1. *Confirming Traditional Claims:*

- \* Chyawanprash has a long history of use, and Safed Musli is often included. Research helps validate the traditional claims about its benefits.
- \* This includes effects on immunity, vitality, and overall well-being.

### 2. *Understanding the Active Compounds:*

- \* Research helps identify the specific compounds in Safed Musli that are responsible for its effects.
- \* This allows for standardization and quality control of Chyawanprash formulations.

### 3. Dosage and Efficacy:

- \* Studies can determine the optimal dosage of Safed Musli in Chavanprash to maximize its benefits.
- \* Research helps assess how effectively Safed Musli contributes to the overall efficacy of Chavanprash.

### 4. Safety and Side Effects:

- \* Research is needed to ensure the safety of Safed Musli in Chavanprash, including potential side effects and interactions with other substances.
- \* Long-term studies are important to evaluate any potential risks.

### 5. Mechanism of Action:

- \* Research helps uncover how Safed Musli works at a biological level.
- \* Understanding the mechanisms of action can lead to more targeted and effective use of Chavanprash.

### Objectives:-

- To understand the herbal composition of Chyawanprash.
- To explore its health benefits and mechanisms of action.
- To evaluate its relevance in modern preventive healthcare.
- To analyze its role in boosting immunity and overall well-being.

### 3. Composition:-

#### 3.1. Ashwagandha

Scientific Name: *Withania somnifera*

Family: Solanaceae

Ashwagandha is an herb which is extensively used in Ayurvedic medicine to restore freshness, stamina, strengthen the muscle and improve general well-being. The root of the ashwagandha (*Withania somnifera*) herb is used as a crude medication because it contains active phytoconstituents, specifically Withanolide glycoside. Several animal studies have shown that ashwagandha can affect the hypothalamic-pituitary-gonadal hormonal balance and boost testosterone level.[7] A test was conducted on 50 volunteers to investigate whether ashwagandha root extract is effective in enhancing male sexual health. The study showed that approximately 99.9% of the volunteers had a higher likelihood of experiencing an improvement in sexual function after

administering the root extract. Regardless of group or time, the overall testosterone levels found in the study were all within the normal range.[8]



Fig 1: Ashwagandha

### 3.2. Safed Musli :-

Scientific Name: *Chlorophytum borivilium*

Family: Asparagaceae

It is one of the India's rare plants and its tubers are frequently used in Indian medical system including Ayurveda, Homeopathy and Unani to cure various illnesses like obesity, erectile dysfunction, inflammation, etc. In certain regions of Indian states, it is grown and consumed as a vegetable. Regular intake of safed musli in boiled milk has advantages for those who experience impotence and early ejaculation. The plant is endowed with a variety of chemical components, including triterpenoidal and steroidal saponins, fructans, alkaloids, sapogenin, phenolics, and vital elements like calcium, magnesium, and potassium, making it a rich source of therapeutic agent.[9]

Fig 2: Musli Plant

### 3.3. Amla:-



Scientific name:- *Emblica officinalis* Gaertn

Family :- Phyllanthaceae

*Phyllanthus emblica* aids in digestive improvement, immune boosting, and acidity relief. It helps regulate Blood glucose levels and is beneficial for diabetes as well. Amla is the main ingredient in Chyawanprash. It is rich in Vitamin C and acts as a strong antioxidant and immunity booster. It supports digestion, respiratory health, and rejuvenation (rasayana in Ayurveda). Amla may be added to Musli-based formulations to balance its heating nature, provide antioxidant support, and enhance nutrient absorption. So while amla is not the main ingredient

in Musli formulations, it is sometimes included for its supportive and synergistic effects. Amla boosts immunity and overall wellness. Musli supports reproductive and muscular health. Together, they make a powerful tonic for vitality, aging, and immunity.[10]



Fig 3: Amla

### 3.4. Shatavari:-

Scientific name:- *Asparagus racemosus*

Family:- asparagaceae

Shatavari supports female reproductive health by balancing hormones. It also aids male fertility when combined with musli and ashwagandha. Helps the body cope with physical and emotional stress. Enhances overall vitality, which aligns with the rasayana (rejuvenating) nature of chyawanprash. Combined with Shatavari, it provides both male and female hormonal support, making the formulation unisex. Shatavari is known to strengthen the immune system, complementing chyawanprash's amla-based antioxidant effect. Aids digestion and soothes stomach, improving nutrient absorption from the chyawanpras.

Fig 4: Shatavari

### 3.5. Cinnamon:-



Scientific name:- *Cinnamomum verum*



Family:- Lauraceae

Cinnamon powder can be a beneficial ingredient when used in formulations like Musli Root Chyawanprash, enhancing both flavor and health benefits. Cinnamon adds a warm, sweet, and spicy flavor, balancing the earthy or bitter tones of herbs like musli. Cinnamon stimulates digestive enzymes, helping in better absorption of nutrients from musli and other herbs. Cinnamon stimulates digestive enzymes, helping in better absorption of nutrients from musli and other herbs.



Fig 5: Cinnamon

### 3.6. Cardamon:-

Scientific name:- *Elettaria cardamomum* Maton.

Family:- Zingiberaceae

Cardamom is a traditional spice commonly used in Ayurvedic formulations, including Musli Root preparations and Chyawanprash. cardamom is sometimes used in Chyawanprash for its flavor and potential health benefits, like aiding digestion. Cardamom can aid digestion, reduce blood pressure, and has antioxidant properties. Cardamom adds a warm, aromatic flavor with citrus and floral notes.



Fig 6: Cardamon

### 3.7. clove:-

Scientific name:- *Syzygium aromaticum*

Family:- Myrtaceae

clove (*Syzygium aromaticum*) is often used as an ingredient in Chyawanprash and sometimes in herbal formulations like Musli Root-based preparations. Clove is traditionally included because of its antimicrobial, warming, and digestive properties. It helps enhance immunity, improve respiratory health, and acts as a natural preservative.



Fig 7: Clove

### 3.8. Ghee:-

Ghee, or clarified butter, is one of the most prized meals and a great source of energy. It is extremely Important for maintaining body temperature, aiding in weight loss, unclogging blocked noses, improving Digestion, and stimulating heart activity



Fig 8: Ghee

### 3.9. Jaggery:-

Jiggery (known as Gur in Hindi) is often used in Musli Root Chyawanprash for several key reasons beyond just sweetening. Acts as a healthy, unrefined alternative to sugar. Helps bind the herbs together into a paste or jam-like consistency. Known to purify blood and cleanse the liver. Supports elimination of toxins, complementing the detoxifying effects of other herbs like amla and ashwagandha. In Ayurveda, jaggery is considered a good anupana (vehicle) that aids the delivery and absorption of other herbs into tissues. Provides quick-release natural energy, useful in formulations aimed at stamina, fertility, or recovery from fatigue.[11]



Fig 9: Jaggery

## 4. Material and methods :-

### 4.1. Meterial:-

Table no. 1: Formulation

Ingredients	Quantity
Safed musli	10 gm
Amla	25 gm
Ashwagandha	5 gm
Shatavari	5 gm
Jaggery	25 gm
Ghee	10 gm
Cardamon powder	3.5 gm
Clove	3.5 gm
Cinnamon	3.5 gm

### 4.2. Methods:-

1. Prepare the safed musli root and amla powder.
2. Mix the all ingredients.
3. Heat the mixture.
4. Cool the mixture.
5. Store the safed musli chyawanprash.



### 4.3. Procedure:-

- 1) Clean and dry the safed musli root and amla fruits thoroughly.
- 2) Grind the safed musli root and amla fruits into a fine powder using a grinder or mortar and pestle.
- 3) Mix the safed musli root powder, amla fruits powder, ghee, jaggery, and spices ( cardamom powder, clove, cinnamon) in a mixing bowl.
- 4) Heat the mixture in a saucepan over low heat, stirring constantly
- 5) Cook the mixture until it thickens and the jaggery dissolves.
- 6) Cool the mixture to room temperature.
- 7) Store the chyawanprash in an airtight container in the refrigerator.

### 5.Evaluation of Safed musli chyawanprash:-

#### 5.1. Organoleptic parameters:-

- **Texture:-** Semi solid sticky paste.
- **Colour:-** Brownish black.
- **Odour:-** sweet and spicy odour and astringent feel after taste.[12]



Fig 10: Chavanprash

#### 5.2. Physiochemical parameters:-

- **PH:-** Purpose of PH test is to determine the PH level in chyawanprash. The acceptable range for chyawanprash is typically, it should be close to ( PH 5-8) Result are found to be pH test is ( PH 5).



Fig 11: PH test

- **Solubility test :-** Determine the solubility in Chyawanprash in water. Chyawanprash are water soluble .[13]

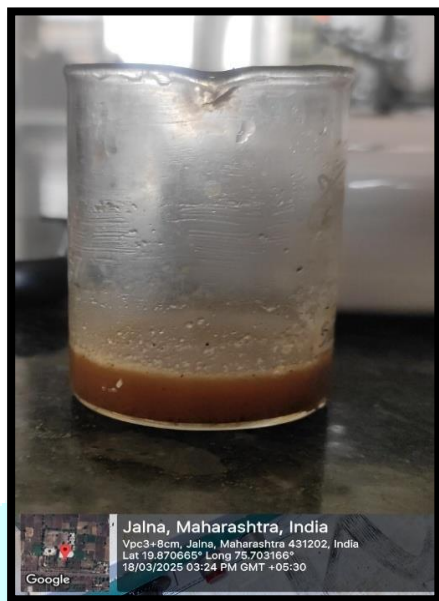


Fig 12: Solubility test

- **Moisture content test:-**  
Weight of wet sample = 10 g  
Dry the sample at temp (105 – 110°C)  
Weight of dry sample = 8.25

**Calculation:-**

$$\begin{aligned}
 \text{Formula} &= \frac{\text{wt. of wet sample} - \text{wt. of dry sample}}{\text{Wt. of dry sample}} \times 100 \\
 &= \frac{10 \text{ g} - 8.25}{8.25} \times 100 \\
 &= 1.75 \times 8.25 \times 100 \\
 &= 0.21 \times 10 \\
 &= 21\%
 \end{aligned}$$

**5.3. Chemical test:-**

- **Flavonoids test:-** 5 drops of ferric chloride solution were added 2 gm chyawanprash.
- **Alkaloids test:-** 5 drops of Wagner's reagent were added to 2 gm chyawanprash. The mixture was warmed for one minute.
- **Steroids test:-** 2ml acetic anhydride was added to 1gm of chyawanprash. The solution was acidified by dropwise addition of sulphuric acid.
- **Glycosides test:-** 2.5 gm chyawanprash, 2ml glacial acetic acid was added. This was followed by addition of one drop of  $\text{FeCl}_3$  the was then acidified by drop wise addition of concentered  $\text{H}_2\text{SO}_4$  .
- **Saponin test:-** 2gm of the chyawanprash was diluted with 10ml distilled water and vigorously shaken well for 20 min in a graduated cylinder.
- **Tannin test:-** 2ml of % ferric chloride was added to 2 gm chyawanprash.[14]



Fig.13: Chemical test result

**Results:-**

Table no 2: Chemical test

Test	Observation	Result
ferric chloride Test for flavonoids 5 drops of $\text{FeCl}_3$ + 2 gm chyawanprash	Green colour turns blue	phenolic hydroxyl group
Wagner's test for alkaloids Wagner's reagent + 2gm sample warm it for 1 min	Reddish brown PPT appears	Alkaloids are present
Test for steroid Test 2 gm of sample + 2ml acetic anhydride + $\text{H}_2\text{SO}_4$	Dark green or blue colour appears	Steroid is present
Sulphuric acid test for glycosides 2.5 gm chyawanprash + 2ml glacial acetic acid + $\text{FeCl}_3$ + $\text{H}_2\text{SO}_4$	Brown ring are not appears	Glucosides are absent
Test for saponins: 2gm of the chyawanprash diluted in 10 ml water shake it for 20min	1 cm layer of foam appears	Saponins are present
Braemer's test for tannin 2 gm sample + 2ml $\text{FeCl}_3$	Dark blue / greenish grey colour appears	Tannins are present

### 5.3 observation of Test :-

Fig 14: Blood test

Fig 15: Blood serum test

**OM SAI CLINICAL LABORATORY**  
Medical Lab Technical Analysis Result Sheet

Shyam.T.Choudhari  
B.Sc (Micro) PGDMLT- Mumbai  
Reg No. AD/MLT 0066/2019 (MPMC)  
Babasaheb.K.Wagh  
DMLT

NAME : Akshay Guthe DATE : 21-May-25  
AGE / SEX : 20 years / Male ID : 4  
REF. BY : Self, -

**COMPLETE HAEMOGRAM REPORT**

	Patient Value	Normal Value
* Haemoglobin	14.1 gm / dl	M :- 14 - 18 gm / dl F :- 12 - 14 gm / dl
* RBC Count	4.56 million / cu.mm.	M:-4.5-6.4 mill./cu.mm. F:- 4.5 - 5 mill./cu.mm.
* Haematocrit (PCV)	41.2 %	M :- 40 - 54 % F :- 35 - 47 %
* Mean Cell Volume (MCV)	90.35 fL	76 - 96 fL
* Mean Cell Hb. (MCH)	30.92 pg	27 - 32 pg
* Mean Cell Hb. Con.(MCHC)	34.22 gm / dl	30 - 35 gm / dl
* R.D.W.	15.2 %	11.6 - 13.7 %
* Total Leukocyte Count	5,900 / cu.mm.	4,000 - 10,000 / cu.mm.
* Differential Leukocyte Count		
Neutrophils	65 %	40 - 75 %
Lymphocytes	30 %	20 - 45 %
Monocytes	4 %	2 - 10 %
Eosinophils	1 %	1 - 6 %
Basophils	0 %	0 - 1 %
* Platelet Count	3,10,000 / cu.mm.	1.5 - 4.5 lac / cu.mm.

Medical Lab Technologist

Address: Near Ganpati Mandir, Chhatrapati Shivaji Maharaj Chauk Badnapur - 431202  
omlaboratory88@gmail.com 8888548306, 9421504007

**OM SAI CLINICAL LABORATORY**  
Medical Lab Technical Analysis Result Sheet

Shyam.T.Choudhari  
B.Sc (Micro) PGDMLT- Mumbai  
Reg No. AD/MLT 0066/2019 (MPMC)  
Babasaheb.K.Wagh  
DMLT

NAME : Akshay Guthe DATE : 21-May-25  
AGE / SEX : 20 years / Male ID : 4  
REF. BY : Self, -

**KIDNEY FUNCTION TESTS**

	Patient Value	Normal Value
* Blood Urea	24 mg / dl	18 - 40 mg / dl
* Serum Creatinine	0.78 mg / dl	0.6 - 1.3 mg / dl

Medical Lab Technologist

Address: Near Ganpati Mandir, Chhatrapati Shivaji Maharaj Chauk Badnapur - 431202  
omlaboratory88@gmail.com 8888548306, 9421504007

## 6. Therapeutic and pharmacological properties:-

### 6.1. Mechanisms of Action of Chlorophytum borivilianum (Safed Musli)

Chlorophytum borivilianum (Safed Musli) is known for its wide-ranging therapeutic effects, particularly in the realm of male reproductive health. In addition to its aphrodisiac and testosterone-boosting properties, Safed Musli also exerts several other beneficial actions, immunomodulatory effects.[15] These mechanisms play a crucial role in enhancing overall health, and immunity.

### 6.2. Immunomodulatory Effects

The immune system plays a crucial role in maintaining reproductive health by protecting the body from infections, balancing inflammation, and ensuring the proper functioning of reproductive organs. In the context of male fertility, an overactive immune response can lead to autoimmune reactions against sperm, reduced sperm motility, and infertility.[16] Safed Musli has been shown to modulate the immune system, enhancing immune function when needed and suppressing excessive immune responses that may hinder fertility.[17]



### Mechanisms of Immunomodulatory Action in Safed Musli

Cytokines are signaling molecules that regulate immune responses. Safed Musli has been shown to modulate cytokine production, balancing pro-inflammatory and anti-inflammatory cytokines. By reducing excessive inflammation, Safed Musli helps maintain a healthy immune response in the reproductive system.[18] Safed Musli boosts the activity of immune cells, such as macrophages and lymphocytes, which play a key role in fighting infections and promoting tissue repair. This immune-enhancing effect is beneficial for overall health and fertility, as it supports the body's defense mechanisms without causing an overactive immune response.[19] Chronic inflammation in the reproductive organs, such as the testes or prostate, can lead to reduced sperm quality, erectile dysfunction, and other reproductive issues. Safed Musli has demonstrated anti-inflammatory properties, helping to reduce inflammation in reproductive tissues and improve overall sexual and reproductive health.[20] An important feature of immune system regulation is the ability to tolerate foreign cells, such as sperm. Safed Musli helps modulate immune tolerance, preventing the immune system from attacking sperm cells and supporting fertility in individuals with autoimmune-related infertility issues.[21]

Chyawanprash, particularly its vitamin C content, can stimulate and enhance the activity of immune cells like natural killer (NK) cells, which are crucial for fighting viral infections.

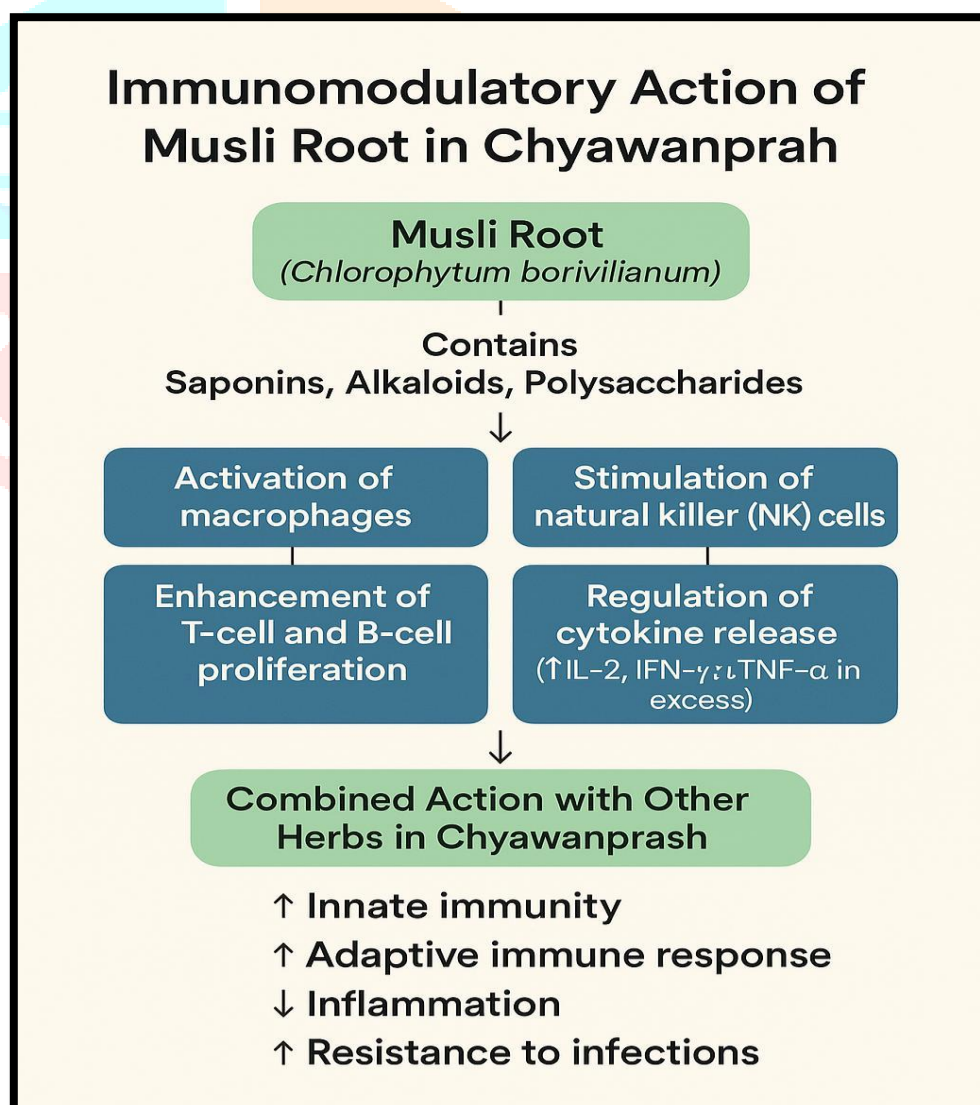


Fig 16: Immunomodulatory action of musli root in chyawanprash



## 7. Conclusion:-

according to above information, we can say that Chyawanprash act as an immunity booster and restore youthfulness due to repairing damage tissues, slow down aging process and having health promoting activity for all age groups and acts as a natural food supplement for present era.

Safed Musli, as a key ingredient in Chavanprash, presents a fascinating area of study due to its potential health benefits. The research indicates that Safed Musli contributes to Chavanprash's overall efficacy through its adaptogenic, antioxidant, and potential aphrodisiac properties. These characteristics suggest that Chavanprash, with Safed Musli, may support vitality, reduce oxidative stress, and improve reproductive health.

However, it is crucial to acknowledge the limitations of current research. While preliminary studies show promise, more rigorous clinical trials are necessary to fully understand the mechanisms of action, optimal dosages, and long-term effects of Safed Musli in Chavanprash. Further investigation should focus on isolating and characterizing the active compounds responsible for the observed effects and assessing the safety and efficacy of Chavanprash across diverse populations.

In conclusion, Safed Musli enhances the value of Chavanprash, but further research is vital to validate and expand our understanding of its therapeutic potential. This will enable more informed recommendations and promote the safe and effective use of Chavanprash as a health supplement.

## 7. References:-

Bopana N, Saxena S. *Asparagus racemosus*—Ethnopharmacological evaluation and conservation needs. *Journal of ethnopharmacology*. 2007 Mar 1;110(1):1-5.

[2] Adodo A, Iwu MM. *Healing plants of Nigeria: Ethnomedicine and therapeutic applications*. CRC Press; 2020 Mar 17.

[3] Winston D. *Adaptogens: herbs for strength, stamina, and stress relief*. Simon and Schuster; 2019 Sep 17.

[4] IsHak WW, Clevenger S, Pechnick RN, Parisi T. Sex and natural sexual enhancement: Sexual techniques, aphrodisiac foods, and nutraceuticals. *The Textbook of Clinical Sexual Medicine*. 2017:413-32.

[5] Priya Marwaha and Laxmi Narayana Gupta (2019), "646. A Review On Chyawanprash: A Good Immunomodulator And Health Promoting Agent For All Ages Groups", *World Congress of Ayurveda*, Department of Rasa shastra and Bhaishajya Kalpana, Faculty of Ayurveda, IMS, BHU., 400.

[6] Dabur Chyawanprash for Immunity. Retrieved from: <https://www.dabur.com/dabur-chyawanprash/>.

[7] Lopresti AL, Drummond PD, and Smith SJ, A Randomized, Double-Blind, Placebo-Controlled, Crossover Study Examining the Hormonal and Vitality Effects of Ashwagandha (*Withania somnifera*) in Aging, Overweight Males. *American Journal of Men's Health*, 2019; 1-15.

[8] Chauhan S, Srivastava MK and Pathak AK, Effect of standardized root extract of ashwagandha (*Withania somnifera*) on well-being and sexual performance in adult males: A randomized controlled trial. *Wiley Health Science Report*, 2022; 1-10.

[9] Bansal N, Safed Musli *Chlorophytum borivilianum*. *MOJ Bioequivalence and Bioavailability*, 2018; 5: 327-330.

[10] Ram, G.; Amrit, S.; Khem, R. Sri Krishna Das; Sri Vanketshwar Steam Press: Bombay, India, 1948; p. 3.

- [11] Mehta, R.M. History of indian medicine, in Realms of Ayurveda by Bandit shiv shrma; Arnold- Heinemann publishers: New Delhi, India, 1997, 66p.
- [12] Ojha J.K chyawanprash from vedic and genomic era; chaukhamba sanskrit pratishta; New Delhi India, 2003.
- [13] Anonymous, Ayurvedic pharmacopeia of India part-2 (formulation), 1<sup>st</sup> edition, Department of AYUSH : New Delhi, India, 2007; Volume-1.
- [14] Bharti Ashirwar, Evaluation of stability of ayurvedic formulation vasavaleha, Asian J. res. Pharma. Sci. 3(1); Jan-Mar 2013; page 01-04.
- [15] Kumar, M., et al. (2013). Aphrodisiac effects of Kali Musli. Asian Journal of Andrology, 15(4), 520-526.
- [16] Paul S, Chakraborty S, Anand U, Dey S, Nandy S, Ghorai M, Saha SC, Patil MT, Kandimalla R, Proćków J, Dey A. Withania somnifera (L.) Dunal (Ashwagandha): A comprehensive review on ethnopharmacology, pharmacotherapeutics, biomedicinal and toxicological aspects. Biomedicine & Pharmacotherapy. 2021 Nov 1;143:112175.
- [17] Sattler S. The role of the immune system beyond the fight against infection. The immunology of cardiovascular homeostasis and pathology. 2017:3-14.
- [18] Sharma P, Chandrul KK. Chlorophytum borivilianum (Safed musli): a vital herbal drug. Int J Pharm Med Res. 2017 Feb 15;5(1):401-11.
- [19] Bhikha R, Glynn J. The pharmacological action of common herbal remedies. American Journal of Internal Medicine. 2018;6(5):99-107.
- [20] Hossain R, Dey D, Biswas P, Paul P, Ahmed SZ, Khan AA, Ema TI, Islam MT. Chlorophytum borivilianum (musli) and cimicifuga racemosa (black cohosh). InHerbs, shrubs, and trees of potential medicinal benefits 2022 Jun 28 (pp. 45-82). CRC Press.
- [21] Dutta S, Sengupta P, Slama P, Roychoudhury S. Oxidative stress, testicular inflammatory pathways, and male reproduction. International journal of molecular sciences. 2021 Sep 17;22(18):10043.