



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

A Review Article On Immunostimulant Polyherbal Edible Jellies

Anirudha pawar ,Akanksha more ,Sakshi lagad ,Neha mohite

Delonix Society's Baramati college of pharmacy Barhanpur , Baramati , Maharashtra India 413202

ABSTRACT

This study focuses on formulating and polyherbal immunostimulant jellies made from Amla (*Emblica officinalis*), Ginseng (*Panax ginseng*), and Moringa (*Moringa officinalis*), which collectively demonstrate significant immunostimulant properties. Ginseng, a traditional herb from Asia, has an extensive research background, showcasing its diverse roles in health, including immune support and potential benefits for cancer and neurodegenerative conditions. Amla, a time-honored remedy, is packed with antioxidants like vitamin C, gallic acid, and flavonoids, along with other beneficial compounds. Moringa, often called the "miracle tree," is rich in essential nutrients. This study also examines the use of agar-agar as a gelling agent in various concentrations to optimize the jelly's texture and stability. The findings highlight the potential of polyherbal jellies as a convenient and effective immunomodulatory option, presenting a promising alternative to traditional medicines. polyherbal, Immunostimulant, food agar-agar, jellies, Traditional plants

KEYWORDS

polyherbal, Immunostimulant, food agar-agar, jellies, Traditional plants

INTRODUCTION

Moringa oleifera Lam., often referred to as the "miracle tree," is notable for the wide use of all its parts in both culinary and medicinal applications. A member of the Moringaceae family, it is a small, delicate, deciduous tree with sparse foliage and leaves that are triply compound. The tree produces flowers in loose clusters, and its long fruit contains seeds with thin, papery wings. Known by names such as Drumstick, Shobhanjana, and Shevga, Moringa's leaves and fruit are commonly used worldwide, though its seeds are less widely recognized.

In traditional medicine, these seeds, whether raw or crushed, are prepared in decoctions to help alleviate stomach pain, ulcers, poor vision, joint discomfort, and digestion issues. Moringa seeds are also known for their antioxidant properties, helping to mitigate oxidative stress linked to aging and cancer. Additionally, they are used to soothe sunburn. The seeds produce a valuable oil, known commercially as Ben oil, which serves as an excellent alternative to olive oil. Moringa leaves are packed with essential phytonutrients that support and strengthen the immune system, helping it effectively combat infections.

Amla, or Indian gooseberry, is a revered herb and a valuable natural remedy for human health, belonging to the Euphorbiaceae family. According to ancient Indian mythology, Amla, thought to be the earliest tree in existence, is native to India and flourishes in tropical and subtropical regions like Pakistan, Sri Lanka, and Southeast Asia. This small to medium-sized tree has light grey bark, simple light green leaves, greenish-yellow flowers, and pale yellow, fleshy fruits with six seeds. Amla is rich in fiber, carbohydrates, iron, and especially vitamin C. Widely used in Ayurveda, Amla enhances immunity and is beneficial in treating cancer,

diabetes, liver issues, heart disease, and anemia. It acts as an antioxidant, immune booster, and is helpful for memory, eye health, cholesterol reduction, and even as an antimicrobial. The fruit contains active compounds like tannins, Emblicanin A and B, gallic acid, and ellagic acid, known for their medicinal properties. Traditionally, Amla is used as a restorative tonic, digestive aid, and treatment for various ailments, including cold, fever, inflammation, and digestive disorders.

Ginseng, also known as "man-root" due to its human-like root shape, is a popular herb with potential benefits for the whole body. The medicinal part includes the dried main and lateral root along with root hairs. Ginseng contains ginsenosides, which are believed to be its active components. Although ginsenosides have limited brain penetration, their metabolites can cross the blood-brain barrier and act on neural cells. Some studies suggest ginseng may improve cognitive functions, such as reaction time, word recall, and reducing mental fatigue. Recent studies of ginseng also emphasize the adjuvant effects of ginseng on the Th1 and Th2 immune responses as well as antibody responses. In addition to increase in lymphocyte proliferation, ginseng promotes the production of cytokines which stimulate both Th1 and Th2 immune response

PHARMACOGNOSTIC STUDY:- 1 MORINGA:-



Fig No.1

Synonym

Commonly known as the Drumstick tree, Horseradish tree, or Miracle tree. In Hindi, it is known as "Sahijan" or "Munaga."

Biological Source

Moringa oleifera, belonging to the family Moringaceae. The leaves, seeds, flowers, pods, and roots of this tree are used for various medicinal and nutritional purposes.

Geographical Source in India

Moringa is widely cultivated across India, particularly in Tamil Nadu, Kerala, Maharashtra, Andhra Pradesh, and Karnataka. It is also found in various states of northwestern India, including Rajasthan and Punjab.

Cultivation and Collection Methods

Moringa grows well in tropical and subtropical climates, with well-drained sandy or loamy soil. It thrives in areas with an annual rainfall of 250–1500 mm and is tolerant of drought conditions. Propagation is done by

seeds or stem cuttings, with optimal planting done before the monsoon season. The trees are pruned regularly

to promote growth. Leaves, flowers, and immature pods are harvested as needed, with leaves collected when they are young and tender. Harvesting can occur year-round.

Morphology

Height: The tree grows up to 10–12 meters tall.

Leaves: Pinnately compound leaves, with small, oval, green leaflets.

Flowers: White or cream-colored, with a pleasant fragrance, arranged in loose clusters.

Pods: Long, slender, green pods (also known as drumsticks), up to 45 cm in length, containing rounded seeds.

Seeds: The seeds are globular, brownish, and winged. Microscopy

Leaf: Shows an epidermal layer with stomata, parenchyma cells with chloroplasts, and vascular bundles.

Seed: Contains oil cells and starch grains.

Root and Stem: Exhibit typical dicotyledonous features with xylem, phloem, and lignified fibers.

Chemical Constituents

Moringa contains a variety of bioactive compounds: **Vitamins:** High in vitamins A, B, C, D, and E.

Minerals: Rich in calcium, potassium, iron, magnesium, and zinc.

Phytochemicals: Includes flavonoids, phenolics, alkaloids, tannins, and saponins.

Proteins and Amino Acids: Contains all essential amino acids.

Other Compounds: Glucosinolates, isothiocyanates, and quercetin, which contribute to its antioxidant, anti-inflammatory, and antimicrobial properties. **Anti-diabetic Properties** Moringa has shown potential in managing both Type 1 and Type 2 diabetes. In Type 1 diabetes, the body fails to produce insulin, a hormone essential for maintaining normal blood glucose levels. Type 2 diabetes is characterized by insulin resistance and, in some cases, beta-cell dysfunction, which impairs the cells' ability to sense glucose levels, leading to inadequate insulin signaling and elevated blood glucose.

Several studies suggest that Moringa can act as an anti-diabetic agent. One study demonstrated that aqueous extracts of *M. oleifera* could treat streptozotocin-induced Type 1 diabetes and aid insulin response. **Anti-diabetic Properties** Studies have demonstrated that Moringa may benefit insulin-resistant Type 2 diabetes in rats.

Anticancer Properties :-Cancer is a prevalent disease, accounting for one in seven deaths, often due to inadequate treatment. In India, approximately 2.4 million cases are reported, though there are no definitive causes for cancer development. Factors such as smoking, sedentary lifestyles, and radiation exposure can contribute to its onset. Conventional cancer treatments like surgery, chemotherapy, and radiation are costly and often bring adverse side effects. Moringa

oleifera shows promise as a natural, reliable, and safe anticancer agent when used in proper concentrations. Studies indicate that Moringa has antiproliferative properties, meaning it can inhibit cancer cell growth.

Soluble and solvent extracts from the leaves have proven effective as anticancer agents. Additionally, research suggests that Moringa's antiproliferative action may be linked to its ability to induce reactive oxygen species within cancer cells, which disrupts their growth.

Other Diseases:-Moringa acts as a potent neuroprotectant. Cerebral ischemia, caused by blocked blood flow to the brain, leads to reperfusion and lipid peroxidation, which generates reactive oxygen species (ROS). With its antioxidant properties, Moringa can help reduce ROS, thereby protecting the brain. Moringa oleifera is also used in treating dementia, as it has shown benefits in enhancing spatial memory. **Antioxidant Activity:-**The fruits and leaves of Moringa oleifera have notable antioxidant properties.

Leaf extracts have shown a concentration-dependent increase in glutathione levels and a reduction in malondialdehyde levels. Fruit extracts have been effective in neutralizing free radicals, while root extracts significantly reduced iron- and FeSO₄-induced lipid peroxidation in a dose-dependent manner. The pods demonstrated the ability to scavenge peroxy, superoxide, and DPPH radicals [16].

Cardiovascular Activity:-Moringa oleifera leaf extract has been shown to significantly reduce cholesterol levels and has a protective effect on hyperlipidemia induced by iron deficiency in male Wistar rats. Its antihypertensive effects were observed in spontaneously hypertensive rats, as well as reduced chronotropic and inotropic effects in isolated frog hearts. The active compounds responsible for hypotensive effects include niazinin A, niazinin B, and niazimicin

Gastroprotective and Anti-Ulcer Activities:-Leaf extract of Moringa

Significantly reduced ulcer index in ibuprofen-induced gastric ulcers and in the pyloric ligation model. It also showed notable effects in reducing cysteamine-induced duodenal and stress ulcers. Bisphenols and Flavonoids present in the extract may contribute to these gastroprotective properties

Antiasthmatic Activit:-Seed extracts of Moringa have demonstrated

Protective effects against asthma in various experimental models. The proposed mechanism for this activity includes a direct bronchodilator effect, coupled with anti-inflammatory and antimicrobial actions, as well as the inhibition of immediate hypersensitivity reactions. Ethanol extracts of the seeds tested against ovalbumin-induced airway Inflammation in guinea pigs showed a significant improvement in respiratory parameters and a reduction in interleukins in bronchoalveolar lavage fluid.

Antidiarrheal Activity:-Seed extracts of Moringa significantly reduced gastrointestinal motility and were effective in treating castor oil-induced diarrhea in male Wistar rats. The antidiarrheal activity is attributed to phytochemical components, including tannins, saponins, and flavonoids [20].

Anti-obesity Activity:-A notable decrease in body mass index was observed after the oral administration of leaf powder compared to the obese control group. In a study with hypercholesterolemic rats treated with methanolic extracts of Moringa oleifera leaves for 49 days, there was a significant reduction in total cholesterol, triglycerides, and body weight. Moreover, levels of liver biomarkers, organ weights, and blood glucose also showed declines. The mechanisms contributing to these effects involve the downregulation of mRNA expression for leptin and resistin, alongside the upregulation of adiponectin gene expression in obese rats [19].

Immunomodulatory Activity:-The methanolic extract of Moringa

oleifera has been found to stimulate both humoral and cellular immune responses. Moreover, the extract resulted in increased optical density and stimulation index, indicating enhanced splenocyte proliferation.

2AMLA:-

Fig No.2

Synonyms:-Emblica, Indian goose berry, amla.

Biological Source:-This consists of dried, as well as fresh fruits of the plant *Emblica officinalis* Gaerth (*Phyllanthus emblica* Linn.), belonging to family Euphorbiaceae.

Geographical Source:-It is a small- or medium-sized tree found in all deciduous forests of India. It is also found in Sri Lanka and Myanmar. The leaves are feathery with small oblong pinnately arranged leaflets. The tree is characteristic greenish-grey and with smooth bark.

Cultivation and Collection:-It is grown by seed germination. It can also be propagated by budding or cutting. It does not tolerate the frost or drought. It is normally found up to an altitude of 1500 m. Commercially, it is collected from wild-grown plants.

Nowadays, the newly released varieties are selected for better yield. These are known as Banarasi, Kanchan, Anand-2, Balwant, NA6, NA7 and B5-1. Seeds or seedlings are placed at a distance of 4.5×4.5 meters in red loamy or coarse gravelly soil. Proper arrangement for irrigation is required, Drip irrigation is most suitable. Fertilizers in the dose range of 750–900 gm of urea, 1 kg superphosphate, and 1 to 1.5 kg of potash per annum depending upon the quality of soil are sufficient. The above

dose is divided into two equal parts, one part is applied in

September/October, whereas the other in April to May every year.

Pruning is done regularly and only four to six branches about 0.75 to 1.0 meter above the ground are retained. Plant bears male and female flowers separately. Male flowers are reported in the axil of the leaf, in bunches, whereas female flowers in the axil of the branches are solitary. The extent of fertilization is 25–30% of flowers. Cultivated plants bear comparatively large fruits. The tree flowers in hot season and the fruits ripen during the winter.

Table No.1. Morphology

| | |
|----------------|---|
| Colour | Green changing to light yellow or brick red when matured. |
| Odour | None |
| Taste | Sore and astringent. |
| Shape | The fruits are depressed, globose. |
| Size | 1.5 to 2.5 cm in diameter. |
| Extra features | Fruits are fleshy obscurely four-lobed with 6-trygonous seeds. They are very hard and smooth in appearance. |

Microscopy:-Fruit shows an epicarp consisting of epidermis with a thick cuticle and two to four layers of hypodermis; the cells in hypodermis is tangentially elongated, thick-walled, smaller in dimension than epidermal cells; mesocarp consists of thin-walled isodiametric parenchymatous cells; several collateral fibrovascular bundles scattered throughout mesocarp; xylem composed of tracheal elements, fibre tracheids and xylem fibres; tracheal elements, show reticulate, scalariform, and spiral thickenings; mesocarp also contains large aggregates of numerous irregular silica crystals.

Chemical Constituents:-The plant is propagated primarily through seed germination, although it can also be propagated by budding or cuttings. It is sensitive to frost and drought and typically grows at altitudes up to 1500 meters. Commercially, it is harvested from wild plants.

In recent years, new varieties have been developed to improve yield, such as Banarasi, Kanchan, Anand-2, Balwant, NA6, NA7, and B5-1. Seeds or seedlings are planted at intervals of 4.5 x 4.5 meters in red loamy or coarse gravelly soils. Effective irrigation is necessary, with drip irrigation being the most efficient method. Fertilization generally requires 750–900 grams of urea, 1 kg of superphosphate, and 1 to 1.5kg of potash annually, adjusted to soil quality. This amount is split in half, with one application in September/October and the other in April/May each year. Regular pruning is carried out, retaining only four to six branches at a height of about 0.75 to 1.0 meters above the ground. The plant produces separate male and female flowers, with male flowers growing in clusters in the leaf axils and female flowers appearing individually in branch axils. Fertilization occurs in approximately 25–30% of the flowers, and cultivated plants produce relatively larger fruits. The tree flowers during the hot season, leading to fruit development.

Chemical Tests:-

1. Alcoholic or aqueous extract of the drug gives blue colour with ferric chloride solution.
2. To aqueous extract add gelatine and sodium chloride milky white colour is produced.
3. To the aqueous extract of amla add lead acetate remove precipitate by filtration. To the filtrate add solution of 2:6 dichlorophenol— indophenol, colour disappears.

Uses

Healing Options:-Amla helps protect cells from free radical damage and offers antioxidant support.

It is used to address skin issues, respiratory infections, and signs of premature aging. Amla can be beneficial for hemorrhage, diarrhea, and dysentery, and has therapeutic value in managing diabetes. It can be taken in doses of one teaspoon three times daily with milk.

Aging:-Indian gooseberry has rejuvenating effects, containing compounds that help prevent aging and maintain vitality in later years. It enhances body resilience and provides protection against infections. Additionally, it supports heart health, strengthens hair, and benefits various glands in the body.

Scurvy:-Being exceptionally rich in vitamin C, Indian gooseberry is one of the best remedies for scurvy. Powdered dry amla, mixed with an equal amount of sugar, can be consumed in doses of one teaspoon three times a day with milk.

Natural Cure for Anemia:-Amla is high in vitamin C, which is crucial for iron absorption. Amla supplements can be highly beneficial for Individuals with iron-deficiency anemia.

For Diarrhea in Children:-A compound powder made from emblic seed, chitrak root, chebulic myrobalan, pipili, and pallone is administered in age-appropriate doses with warm water, twice daily—once in the Morning and again at bedtime. Tender shoots mixed with buttermilk can relieve indigestion and diarrhea, while fresh green leaves combined with curds have a similar effect. The leaves are also infused with Fenugreek seeds to treat chronic dysentery and serve as a bitter tonic. For biliousness, soak one tola of emblic seeds in a tinned vessel overnight, grind them, mix with cow's milk, and consume.

Other Uses:-Amla helps regulate blood sugar levels and is a potent anti-inflammatory herb with antioxidant properties and a rich source of vitamin C. It effectively neutralizes free radicals and supports brain health. Research indicates that amla can help reduce cholesterol levels and support liver function.

It also boosts hemoglobin levels and increases red blood cell counts. Amla is beneficial for respiratory issues like cough, bronchitis, and asthma, promotes oral health, and strengthens teeth. Its decoction can be used to manage hyperacidity, and when mixed with honey, it acts as a natural anthelmintic. Amla enhances cell survival, reduces free radical formation, and increases antioxidant levels in the body. It is a key ingredient in traditional Ayurvedic formulations like Chyawanprash, which is known to improve cognitive function and memory. Other well-known Ayurvedic medicines containing amla include Triphala and Brahm Rasayana, which have been used for centuries.

3 GINSENG:-

Fig No.3 GINSENG

Synonyms:-

Panax, Asiatic Ginseng, Chinese Ginseng, Ginseng Root, Pannag, Ninjin.

Biological Source:-It consists of dried roots of *Panax ginseng* C.A. Mey and other species of Panax like *Panax japonicus* (Japanese Ginseng), *Panax pseudoginseng* (Himalayan Ginseng), *Panax quinque- folius* (American Ginseng), *Panax trifolius* (Dwarf Ginseng) and *Panax vietnamensis* (Vietnamese Ginseng), belonging to family Araliaceae.

Geographical Source:-It is mainly found in China, Russia, Korea, Japan, Canada and India.

History:-Ancient healers in India, Russia, China and Japan all revered ginseng for its medicinal and health-enhancing properties. In traditional Chinese medicine (TCM), ginseng is used for many purposes, including normalizing blood pressure and blood sugar, as a sexual tonic for both men and women and to strengthen overall health when the body is debilitated.

The botanical name *Panax* comes from the Greek word panacea, meaning 'cure all.' The Chinese name for ginseng, *ren shen*, means 'man root' for its characteristic shape that resembles the trunk, arms and legs of a human being.

Chemical Constituents:-Several saponin glycosides belonging to triterpenoid group, ginsenoside, chikusetsusaponin, panxoside. More than 13 ginsenosides have been identified. Ginsenosides consists of aglycone dammarol where as panaxosides have oleanolic acid as aglycone. It also contains large amount of starch, gum, some resin and a very small amount of volatile oil.

Uses:-Ginseng is a popular herbal remedy with a long history of use in traditional medicine, particularly in Asian cultures. Here are some of its primary uses:

1. **Energy and Vitality:** Ginseng is often used to boost energy levels, reduce fatigue, and improve overall vitality.
 2. **Cognitive Function:** Some studies suggest that ginseng may enhance cognitive performance, including memory, attention, and mental clarity.
 3. **Immune System Support:** Ginseng is believed to help strengthen the immune system, potentially reducing the frequency of colds and other illnesses.
 4. **Stress Relief:** It is thought to help the body adapt to stress and may reduce anxiety levels.
- Blood Sugar Regulation:** Some research indicates that ginseng may help lower blood sugar levels and improve insulin

sensitivity, making it of interest for managing diabetes.

5. Sexual Health: Ginseng has been traditionally used to enhance libido and improve sexual performance.
6. Anti-inflammatory Properties: It contains compounds that may help reduce inflammation in the body.
7. Antioxidant Effects: Ginseng has antioxidant properties, which can help protect cells from damage caused by free radicals.
8. Hormonal Balance: It may support hormonal balance, which can be beneficial for both men and women.
9. Chronic Fatigue Syndrome: Some people use ginseng to help manage symptoms of chronic fatigue syndrome

IMMUNOMODULATORY FUNCTION OF GINSENG:-

Immunomodulating Effects of Aqueous Extracts of Ginseng

Aqueous extracts of ginseng contain amino acids, minerals, saponins, and various water-soluble low- and high-molecular weight compounds. It was reported that a ginseng extract modulated the cytokine production in a mouse model with *Pseudomonas aeruginosa* lung infection. The lung cells from the ginseng extract-treated group produced more interferon γ (IFN- γ) and tumor necrosis factor α (TNF- α), but less interleukin 4 (IL-4), with a higher ratio of IFN- γ /IL-4. Results indicated that a ginseng extract treatment induced a Th1-like immune response (cellular immune response) in the mice with *Panax aeruginosa* lung infection. Medicated jelly formulations are patient friendly dosage form for pediatric, geriatric and dysphagic patients. These formulations offer rapid dissolution and absorption of drugs through oral mucosa therefore show the early onset of action.

REFERENCES

1. Formulation, Evaluation and release rate characteristics of medicated jelly of vitamin C
Khalid A Ibrahim et al. Pak J Pharm Sci. 2017 Mar
2. Wealth of India - A Dictionary of Indian Raw Materials and Industrial Products by the Council of Scientific & Industrial Research (CSIR)
Pharmacognosy and Phytochemistry by Vinod D. Rangari
3. Pharmacognostic and phytochemical investigations on the bark of *Moringa oleifera* Lam.
Hasan Pasha N Sholapur* and Basanagouda M Patil KLES College of Pharmacy
4. Design and Development of Herbal Pediatric Edible Jelly for Anthelmintic Infections
N.L. PRASANTHI*
, P. NANDINI, S.S. MANIKIRAN, N. RAMARAO
Department of pharmaceutics, Chalapathi Institute of Pharmaceutical Sciences, Lam, Guntur
5. Pharmacognostical studies of *Moringa oleifera* Lam. seeds
Bindu Gopalkrishnan, Deb Papiya and Roy Chiranjeev
6. Immunomodulatory effects of *Panax Ginseng* C.A. Meyer in the mouse
7. Journal of Pharmacognosy and Phytochemistry
Sahjana (*Moringa oleifera*), pharmacognosy and pharmacology: A review
Dr. Khursheed Ahmad Ansari 2016; 442-444

8. Kokate CK, Purohit AP, Gokhale SB. Practical pharmacognosy. Pune: Nirali Prakashan

9. FORMULATION AND EVALUATION OF IMMUNOSTIMULANT

POLYHERBAL EDIBLE JELLIES Mr. Pradeep Sonwane Miss Snehal Dombé, Miss Sankruti Bhosale, Mr. Ritesh Chavan, Mr. Jay Avhad, Mr. Saurabh Kokare Science, Technology and Development Volume XIII; 37-50

10. Amla (*Embllica officinalis*): Medicinal food and pharmacological activity International Journal of Academic Research and Development Poonam Yadav ISSN: 2455-4197 Volume 3; Issue 4; March 2018; Page No. 53-55

11. Pharmacognostical Study on the *Panax ginseng* CA Meyer Won-Im Do, Yu-Jin Lee, Jong-Hee Park Korean Journal of Pharmacognosy 35 (1), 45-51, 2004

12. Pharmacognostic and phytochemical investigations on the bark of *Moringa oleifera* Lam Hasan Pasha N Sholapur* and Basanagouda M Patil Indian Journal of Natural Products and Resources, Vol. 4(1), March 2013, pp. 96-101

13. Cognitive effects of nutraceuticals Jason Pitt, Yiuka Pitt, in Nutraceuticals (Second Edition), 2021 Pages 41-61

14. N.L. PRASANTHI*, P. NANDINI, S.S. MANIKIRAN, N. RAMARAO Design and Development of Herbal Pediatric Edible Jelly for Anthelmintic Infections Journal of Pharmaceutical Sciences and Research Vol. 11(6), 2019, 2417-2421

15. Chemical constituents and bioactivities of *Panax ginseng* (C. A. Mey.) Wenwen Ru et al. Drug Discov Ther. 2015 Feb

16. *Moringa* spp: Composition and bioactive properties Author links open overlay panel M.M. Özcan

South African Journal of Botany Volume 129 March 2020, Pages 25-31

17. *Moringa* Powder Benefits: Nutritional Value, Medicinal Use & More By Prekshi Garg

18. Chapter: Pharmacognosy and Phytochemistry : Drugs Containing Tannins

pharmacy180.com