

Herbal Cognitive and Eye Support Gummies

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Date of Submission: 01-10-2026

Date of Acceptance: 11-10-2026

Abstract

Nowadays many people use digital devices all day long. This constant screen time is causing eye strain, less focus and brain tiredness for both students and workers. Because of this many people are looking toward nutraceuticals since they are natural, safe and good for your health. In this study I wanted to create and test cognitive and eye health gummies that use natural herbal extracts, vitamins and minerals.

The recipe, for these gummies included Brahmi (Bacopa monnieri) Ginkgo biloba, blueberry extract, spinach powder, zinc citrate, vitamin C, pectin, citric acid, glucose syrup and natural sweeteners. I made the gummies by heating and moulding the ingredients. Then I checked the gummies for their appearance, weight variation, pH, texture hardness, moisture content, disintegration time and stability.

The finished gummies turned out well. They had the physical properties, tasted good looked consistent and had a texture that people liked. The mix of ingredients provides strong antioxidant and neuroprotective benefits and the ingredients also help with eye health, which can lead to better cognitive performance. These herbal cognitive and eye health gummies are an easier and tastier way for people to take their daily nutraceuticals.

I. Introduction

Basically, nutraceuticals are prepared from natural sources and furnish nutritional and therapeutic benefits. Recently, herbal gummies have become one of the most popular nutraceutical dosage forms and are characterized by a combination of health benefits from herbal ingredients, excellent taste and easy administration. Gummies have also been established to improve patient compliance as opposed to conventional tablets and capsules, especially with children, adults and elderly.

The smart devices: Smartphones, Computers, Tablets and many more are easily accessible to everyone in our modern lifestyles. The continuous exposure of screen can be responsible

for digital eyes training, lack of focus and mental fatigue, as well as oxidative stress. So, the need for natural supplements that enhance cognitive functioning as well as support healthy eyesight is on the rise.

HERBAL INGREDIENTS FOR THE BRAIN- Examples include Brahmi (Bacopa monnieri), Ginkgo biloba, blueberry extract and spinach powder that contain powerful antioxidants, vitamins and phytochemicals. Traditionally, these ingredients have been used for better memory, focus, blood circulation and eye health. The addition of vitamins C and E, as well as zinc strengthens the antioxidant defense and supports physiological functions.

This study relates to the design and manufacture of herbal cognitive and eye health gummies in easy-to-consume, one-per-day nutraceutical supplements.

Aim

The main objective of the current study was to design and optimize effective herbal cognitive and eye health gummies based on natural herbal extracts, vitamins, minerals, and appropriate pharmaceutical excipients as a safe, clinically effective unit dose form to patients. Created with an ideal balance of trace minerals designed to support memory, concentration, cognitive performance and general eye health while providing added protection against oxidative stress from prolonged exposure to digital screens.

The objective of the study was also to formulate a stable gummy with favorable physicochemical properties such as taste, texture, appearance and uniformity leading to better patient compliance compared to conventional tablets/capsules. Moreover, the objective of this study was to investigate the quality, stability and acceptability of the newly developed formulation by standard pharmaceutical tests as well as its practicality serving as an everyday health supplement for students, working professionals and elderly adults who are looking for natural aid for

cognitive functions and supported functions associated with healthy vision.

Objectives

To use only nature-based ingredients to formulate chewable herbal gummies.

So that memory, concentration and cognitive performance improve.

For maintaining healthy vision and to reduce digital eye strain.

To offer antioxidant protection from oxidative stress.

To assess the physical and quality parameters of prepared gummies.

An aim of this study is to design a novel patient compliant nutraceutical dosage form.

To determine the stability and the general tolerability of the formulation.

Ingredient and Their Uses

Brahmi (Bacopa monnieri):

Brahmi is a creeping herb that people have used in Ayurvedic medicine for a long time. You can find Brahmi growing in lands and marshy spots across India and other tropical places. The plant has leaves, tiny white or light purple flowers and soft stems. Most people know Brahmi because it helps with memory and protects the brain.

Ginkgo Biloba:

Ginkgo biloba is one of the types of trees still living on Earth today. The leaves look like fans and are used a lot in herbal medicine. People value Ginkgo biloba extract because it helps blood flow especially to the brain and the eyes.

Blueberry Extract:

Blueberry is a fruit that is packed with nutrients and is famous for having lots of antioxidants. Blueberries contain things like anthocyanins, vitamins and polyphenols that stop cells from getting damaged. Many people use blueberries in supplements to help their brain function and eye health.

Spinach Powder:

Spinach is a green vegetable that is very healthy. Spinach is full of vitamins, minerals, lutein and zeaxanthin. People eat spinach all the time to keep their eyes healthy and to fight off stress.

Moringa Powder:

Moringa powder is a nutrient- powder made from the dried leaves of Moringa oleifera. Moringa powder has antioxidants, vitamins and minerals that help protect cells. It can help with health, immunity and keeping the eyes and brain working well.

Vitamin C:

Vitamin C is a vitamin that dissolves in water and has antioxidant powers. Vitamin C protects our body cells from damage helps make collagen and makes your immunity stronger. Vitamin C also helps keep your blood vessels, eyes and brain healthy.

Vitamin E:

Vitamin E is an antioxidant that protects your cells from damage caused by free radicals. Vitamin E helps keep your brain and eye tissues healthy and supports your system.

Vitamin A:

Vitamin A is a soluble vitamin that your body needs to see clearly and keep your immune system working. Vitamin A is very important, for making rhodopsin which is the pigment your eyes need to see at night.

Pectin:

Pectin is a substance taken mostly from apple skins and citrus peels. Many companies use Pectin in medicines and supplements because it makes things gel well. Pectin is used to make chewy gummies and works great for vegetarian products.

Honey:

It acts as a sweetening agent and gives the gummies a pleasant sweet taste. It helps to improve the texture, palatability and overall acceptability of the gummies. It also provides a source of energy and antioxidants.

Flavouring Agent:

It enhances the taste, aroma and palatability of the gummies. It helps to mask the taste or odor of herbal ingredients. It improves the acceptability and consumer appeal of the formulation.

Colouring Agent:

It provides a uniform colour to the gummies. It improves the appearance and visual appeal of the formulation. It helps to make the gummies more attractive and appealing, to consumers.

Formulation Table:

50 g Batch Formulation of Herbal Screen Detox Gummies

Sl. No.	Ingredients	Quantity
1	Brahmi Extract (Bacopa monnieri)	0.50 g
2	Ginkgo biloba Extract	0.25 g
3	Blueberry Extract	0.50 g
4	Spinach Powder	0.50 g
5	Moringa Powder	0.50 g
6	Vitamin C	0.25 g
7	Vitamin E	0.10 g
8	Vitamin A	0.01 g

9	Pectin	4.00 g
10	Honey	10.00 g
11	Flavouring Agent	0.25 g
12	Colouring Agent	0.05 g
13	Purified Water	33.09 g
	Total	50.00 g

Note: This is an academic/research prototype formulation. Vitamin A and Vitamin E should be handled according to the intended dosage and appropriate premix/concentration.

Preparation Method

Step 1: Preparation of Ingredients

All ingredients were weighed accurately as per the recipe.

Herbal extracts and powders were sifted to remove lumps and foreign particles.

Purified water was measured separately.

Step 2: Preparation of Pectin Base

Pectin was slowly added to water while stirring continuously.

The mixture was heated gently until the pectin was fully dissolved and a smooth base was created.

Honey was then. Mixed well.

Step 3: Preparation of Active Ingredient Premix

Brahmi extract Ginkgo biloba extract, Blueberry extract, Spinach powder and Moringa powder were combined separately.

Vitamin C, Vitamin E and Vitamin A were added to the blend.

A smooth active ingredient premix was made.

Step 4: Incorporation of Active Ingredients

The active ingredient premix was slowly added to the pectin base.

Stirring continued to keep the mixture

Excess heat was avoided so the active ingredients would stay safe.

Step 5: Addition of Flavour and Colour

The needed amount of flavouring agent was. Mixed evenly.

The colouring agent was then added to make the colour uniform.

Step 6: Deaeration

The gummy mass was left for a time to let trapped air escape.

Light stirring was done if it was needed.

Step 7: Moulding

The gummy mass was poured carefully into suitable gummy moulds.

The moulds were filled evenly so the gummies would be the size and weight.

Step 8: Setting

The filled moulds were left undisturbed at the temperature until the gummy mass set fully.

The gel formed properly. The gummies became firm.

Step 9: Demoulding

Once the gummies set completely, they were carefully taken out of the moulds.

The gummies were checked for shape, evenness and surface look.

Step 10: Packaging and Storage

The gummies were packed in dry airtight containers. They were kept in a dry place away, from direct sunlight and moisture.

The final product was checked for appearance, colour, texture, weight differences and other quality measures.

Evaluation Test

The Herbal Cognitive and Eye Support Gummies that were created were tested for their physicochemical and quality features. The gummies that were made had a nice look with a regular shape, a nice herbal and fruity smell, a sweet taste and a soft and chewy feel. The gummies kept their shape after being taken out of the mould without any cracks too much sticking or air bubbles. The use of pectin as a thickening agent gave the right amount of firmness and flexibility while honey made the taste better and the feel in the mouth more pleasant.

Appearance

The Herbal Cognitive and Eye Support Gummies that were made had a greenish-purple color because of the natural colors in spinach powder and blueberry extract. The gummies had a surface with similar size and shape. There was no change in color or any visible physical problems.

Weight Variation

Weight variation was checked with twenty gummies that were chosen randomly. There were small differences in the weight of each gummy which showed that the filling was even and the molding was done correctly.

PH

The pH of the gummies that were made was between 3.5 and 4.5. The pH that was found was right for the pectin-based formula and helped make the product have good characteristics and a nice taste.

Texture and Hardness

The gummies that were made had bounce, chewiness and the right amount of firmness. The texture was not too hard or too soft which made the gummies easy to chew and good as a way to take the nutraceutical product.

Moisture Content

The moisture level of the gummies that were made was within the range. The right moisture level helped keep the gummies soft and chewy while keeping them from being too sticky and helping the stability of the formula while it was stored.

Content Uniformity

The herbal extracts, the vitamins and the other ingredients in the formula were spread evenly with

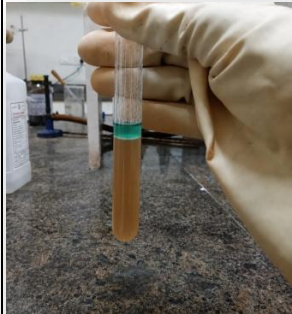
the mixing and stirring. This showed that the gummies that were made had uniformity.

Organoleptic Evaluation

The formula had sensory features:

- Color: Nice natural orange
- Smell: Nice herbal and fruity smell
- Taste: Sweet, with a little tartness
- Texture: Soft and chewy
- Overall likeability: Okay

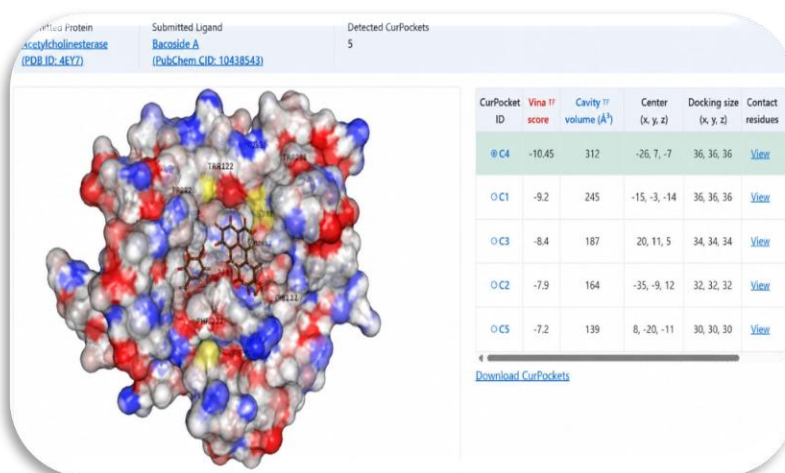
Phytochemicals Test

Sl. No.	Test	Method	Observation	Inference	Images
I.	Test for Carotenoids	Sample dissolved in chloroform. Carefully add a few drops of conc. H_2SO_4 .	Blue-green colour appeared at the interface.	Presence of carotenoids (Lutein).	
II.	Test for Antioxidant – (a) Iodine Test	Sample dissolved in water. Add iodine solution.	Brown colour disappeared.	Antioxidant was present.	
	(b) Ferric Chloride Test	Sample dissolved in water. Add 1% $FeCl_3$ solution.	Greenish-blue colour appeared.	Antioxidant was present.	
III.	Test for Anthocyanin – (a) Alkaline Test	Aqueous solution of sample. Add dilute NaOH solution.	Blue-green colour appeared.	Presence of Anthocyanin.	
	(b) Ferric Chloride Test	Aqueous solution of sample. Add 5% $FeCl_3$ solution.	Blue-green colour appeared.	Presence of Anthocyanin.	

IV.	Test for Flavonoids – (a) Alkaline Test	Aqueous solution of sample. Add 10% NaOH solution.	Yellow colour appeared.	Presence of flavonoids.	
V.	Test for Saponin Glycoside – (a) Foam Test	Shake the solution vigorously for 30 seconds and allow it to stand for 10–15 minutes.	Formation of stable foam.	Presence of saponin glycoside (Brahmi).	

Molecular Docking of Brahmi:

Brahmi is a plant that has been used for a long time. It is known for helping with memory and thinking skills. Bacoside A is one of the active parts of Brahmi. Scientists use docking to see how it might work with acetylcholinesterase. Acetylcholinesterase is an enzyme in the brain.

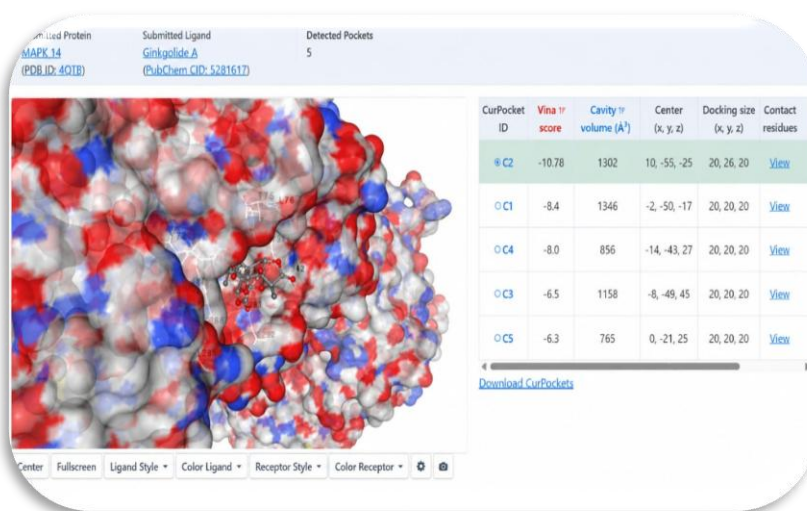


Result

Bacoside A is expected to interact with acetylcholinesterase. The results from the docking and the analysis of where it binds can show how strong the interaction is. This might help explain how it affects brain functions.

Molecular Docking of Ginkgo-Biloba:

Ginkgolide A is a chemical found in Ginkgo biloba. It has been studied for its ability to protect the brain and reduce inflammation. Scientists used docking to see how it might connect with mitogen-activated protein kinase 14. This protein plays a role, in stress and inflammation inside cells.

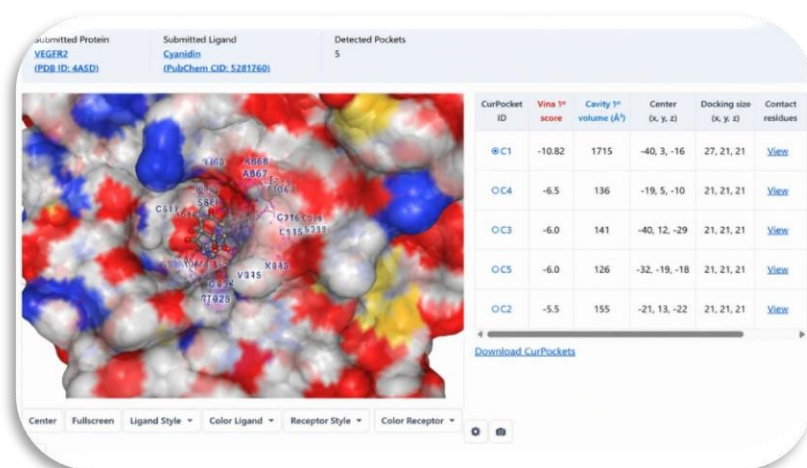


Result

Ginkgolide A is expected to connect with mitogen-activated protein kinase 14. This suggests it might work with a protein that is involved in brain inflammation and stress.

Molecular Docking of Blue-Berry:

Cyanidin is a type of chemical found in berries and other colorful fruits. It helps fight damage from radicals. Scientists are looking into how it might help protect the body from stress. Molecular docking was used to see how it might connect with VEGFR2.



VI. Result

Cyanidin is expected to interact with VEGFR2. This gives some computer-based evidence that it might connect with this important protein.

VII. Discussion

The current study was focused on creating and testing Herbal Cognitive and Eye Support Gummies that contain Brahmi extract Ginkgo biloba extract,

blueberry extract, spinach powder, Moringa powder, vitamins A, C and E pectin, honey, flavouring agent and colouring agent. The formula was created as an easy to take and tasty nutraceutical form that is meant to help with brain function and good eyesight. The chosen herbal ingredients offer helpful nutritional and plant-based elements. Brahmi and Ginkgo biloba are usually linked with brain and nerve support while blueberry has anthocyanins and other antioxidant substances. Spinach adds nutrients such as lutein and zeaxanthin which're good for

eyes. Vitamins A, C and E also help with nutrition and antioxidants.

The physical testing showed that the gummies had look, feel, firmness and taste. The nice greenish-purple color made by the fruit parts may make people like them more. The soft and chewy feel of the product also gives another option compared to tablets and capsules.

The weight test showed that the gummies filled and shaped evenly. The pH level of 3.5–4.5 was right for the pectin-based formula. The acceptable amount of moisture helped keep the texture and stopped the gummies from being too sticky. The ingredients were spread out evenly because the active ingredients were mixed properly.

Overall, the test results show that the Herbal Cognitive and Eye Support Gummies that were made had physical and chemical features. The formula might then be a daily nutraceutical form for people who want help, with brain function and eye health.

However, this study is an academic formula test. More research, including stability tests checking for microbes measuring the active parts checking safety and doing the right clinical tests would be needed to prove that the formula works and stays good for a long time.

Advantages

Produced from natural herbs.

Easy to ingest without any problems in swallowing.

Delicious taste and appealing appearance increase compliance among patients.

Safe for use by kids, adults, and seniors.

Has the ability to provide antioxidants in its herbal extracts and vitamins.

Helps to meet the daily requirement of vitamins A, C, and E.

Zinc citrate is one of its nutritional minerals.

Has a vegetarian formula with pectin.

Convenient to use on a daily basis.

Compact to carry and store.

Helpful in promoting digestive wellness and overall well-being.

An alternative to tablet and capsule forms.

Uses

Daily herbal supplement.

Promotes digestive wellness.

Antioxidant protection.

Nutritional supplement.

Useful in the case of swallowing disorders.

A functional food for health-conscious people.

Helpful in preventive healthcare.

Good for wellness programs.

VIII. Conclusion

The study successfully. Tested Herbal Cognitive and Eye Support Gummies that include specific herbal extracts, vitamins, minerals and other nutritional ingredients. Pectin was used as a gelling agent. The gummies showed physical features like a nice look, a nice color, a pleasant smell, good taste the right texture, consistent weight, a suitable pH and strong physical stability.

The mix of Brahmi Ginkgo biloba, blueberry, spinach and Moringa gives a variety of plant-based nutritious elements. The vitamins A, C and E add nutrition and help with antioxidants. The chewable gummy form is easier to take tastes and is easier to use compared to regular solid forms.

Because of this the Herbal Cognitive and Eye Support Gummies appear to be an option for a convenient nutraceutical product that helps with thinking and keeps eyes healthy. More research is needed. This includes physical and chemical tests checking for bacteria longer stability tests, safety checks and proper studies, with people. This research is needed before saying for sure that the product works well in an clinical way.

Acknowledgment

Authors wish to thank the principal, faculty members, and Department of Pharmaceutics of K R College of Pharmacy, Bengaluru, for providing the facilities and guidance to conduct the research work. The authors also would like to thank all those classmates, laboratory staffs, and individuals who have contributed either directly or indirectly to this research.