Journal Homepage: www.ijarpr.com ISSN: 3049-0103 (Online)

International Journal of Advance Research Publication and Reviews

Vol 03, Issue 10, pp 360-366, October, 2026

Herbal Screen Detox Eye and Brain Supplement Gummies: Formulation, Development, Evaluation and Health Benefits in the Digital Era

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ABSTRACT

Background: It is commonly linked to the long-term use of smartphones, computers and other digital devices that people experience symptoms of digital eye strain, such as ocular discomfort, dryness, blurred vision and headaches. Moreover, prolonged work involving screens may also lead to a feeling of cognitive fatigue. Objective: This research article outlines the scientific reasons for the approach, the concept behind the formulation and the initial evaluation framework for the Herbal Screen Detox Eye and Brain Supplement Gummies. Methods: The carotenoids, herbal extracts, vitamins and minerals selected were done so on the grounds of their known nutritional and pharmacological effects. The gummy dosage form that has been prepared can be assessed for its organoleptic, physical, physicochemical and stability properties. Results: The formulation was developed as a convenient chewable form of a nutritional supplement. The actual results from experiments—such as the average weight, weight variation, pH, moisture content, texture and stability—will be entered from the laboratory batch record; no numerical experimental data have been made up. Conclusion: The formulation does show promise as a nutraceutical idea for promoting eye and cognitive well-being, but there is still a lack of direct clinical evidence regarding the combined gummy. It is still necessary to follow healthy habits when using screens and to seek appropriate professional care.

Keywords: Herbal Gummies, Digital Eye Strain, Lutein, Zeaxanthin, Bacopa monnieri, Blueberry, Ginkgo biloba, Ashwagandha, Cognitive Wellness, Nutraceutical

1.INTRODUCTION

The digital age has changed the way education, communication and professional activities are carried out, leading to people using smartphones, laptops, tablets and computer screens frequently and for long periods. Continuous visual tasks may cause digital eye strain, this appearing as tired eyes, dryness, blurred vision, a headache and visual discomfort. At the same time, extended cognitive workload can lead to a feeling of mental fatigue and a decrease in the sense of concentration.

The American Optometric Association defines computer vision syndrome or digital eye strain as a set of eye and vision problems caused by extended use of computers or digital devices. The main approach to managing it is through ergonomic adjustments, taking regular visual breaks, ensuring proper lighting, blinking regularly and correcting any refractive errors. Attention has also been given to nutritional strategies since macular carotenoids, antioxidant vitamins and certain botanicals have biological functions that are relevant to ocular and cognitive health.

Herbal gummies provide a convenient and pleasant way of taking a dosage that can include a number of nutritional and herbal ingredients. It should not be assumed that evidence for the individual ingredients proves that the final mixture can prevent or treat diseases associated with screen use. That is why the article links product development considerations with a critical evaluation of the existing scientific evidence.

2. AIM AND OBJECTIVES

Objective: To create and assess Herbal Screen Detox Eye and Brain Supplement Gummies as a convenient formulation designed to provide nutritional support for eye and cognitive wellness.

• Choose herbal, carotenoid, vitamin and mineral ingredients according to their reported biological roles.

• To turn the chosen ingredients into a tasty gummy form of dosage.

• Evaluate the prepared gummies by means of appropriate organoleptic and physicochemical criteria.

• To evaluate the physical properties and stability of the prepared formulation.

• Discuss the scientific evidence, the safety aspects and the limitations of the formulation.

3. KEY INGREDIENTS AND THEIR ROLES

3.1 Lutein and Zeaxanthin

Lutein and zeaxanthin are xanthophyll carotenoids that are found in high amounts within the macula. These two play roles in forming the macular pigment and possess anti-oxidant as well as light filtering properties. The best evidence on clinical effects has been documented in studies involving the macula.

3.2 Blueberry Extract

Anthocyanins and other polyphenols that exhibit antioxidative properties are present in blueberry (Vaccinium spp.). Research studies have focused on its benefits in vascular and visual health; however, studies proving the direct link between blueberry and reduction of eye strain are very limited.

3.3 Bacopa monnieri

Bacopa monnieri is a plant-based medicine used to enhance memory and cognition. Some controlled trials have found that it enhances some cognitive functions with consistent use, although results depend on various factors including standardization of the extract and dosing schedule.

3.4 Ginkgo biloba

The Ginkgo biloba plant has been studied in relation to cognitive and circulatory impacts. Studies results are inconclusive, and the botanical may interact with medication especially bleeding-related ones.

3.5 Ashwagandha (Withania somnifera)

Ashwagandha is an adaptogenic herb that has been researched primarily for its effects on stress and sleep. The scientific evidence varies according to preparation and care should be exercised during pregnancy as well as in specific thyroid, autoimmune and drug interactions scenarios.

3.6 Vitamins

It is involved in the maintenance of healthy vision and helps to maintain the immune system. Proper amount should be taken, while an excess of its consumption should be prevented.

4.PROPOSED MECHANISM OF ACTION

- Antioxidant effect: carotenoids, vitamins, and plant-based polyphenols might provide antioxidant defense against the oxidative process.
- Macular pigment effect: lutein and zeaxanthin help form the macular pigment and can absorb a portion of visible light.
- Neurocognitive pathways: Bacopa and other plants have been evaluated for the biological pathways of memory and neuronal signaling.
- Stress effect: Ashwagandha has been evaluated for stress effects; however, this is not a basis of treatment for screen-induced cognitive fatigue.

5.MATERIALS AND METHODS.

The specific composition and method of preparation must be documented through the actual lab batch record. The composition includes the chosen herb extracts, lutein/zeaxanthin, vitamins and zinc along with an appropriate gelling agent, sweetener, acidifier, flavoring agent, and other excipients.

5.1 Formulation Composition

Ingredient	**Quantity**	**Function**
Lutein / Zeaxanthin	1 g	Ocular nutritional support
Blueberry extract	1 g	Eye antioxidant
Ginkgo biloba extract	0.500 g	Anti stress agent
Vitamin A / C / E	0.100g/0.200g/0.050g	Micronutrient support
Gelling agent(pectin)	P	Gummy structure
Sweetener / flavour	25 g	Palatability

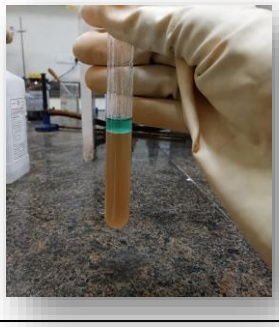
5.2Preparation of Gummies

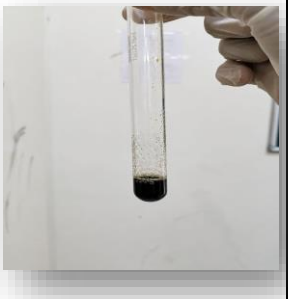
The preparation of the gelling agent was done according to the formulation method selected. Mixing of the sweetener along with other excipients was done with due care. Mixing of the herbal extract, carotenoids and other micronutrients was done at the appropriate stage so that their uniform mixing could take place without undue heat generation. The resulting mass was filled into molds and allowed to set and conditioned/dried as required. They were then removed from the molds and placed in suitable containers.

6. EVALUATION PARAMETERS

- Organoleptic assessment: colour, shape, odour, taste and texture.
- Weight (average and weight variability).
- pH, when relevant to the product and the test procedure.
- Moisture content and physical stability.
- Physical properties such as texture/hardness/stickiness.
- Disintegration/dissolution, when there is a relevant procedure.
- Storage stability under chosen storage conditions.

7. 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).	

Sl. No.	Test	Method	Observation	Inference	Images
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 Protein – Biuret Test	Sample dissolved in H_2O. Add Biuret reagent [10% NaOH + 1% $CuSO_4$].	Violet/purple colour develops.	Presence of protein.	
VI	Test for Gelling Agent – Calcium Chloride Test	Aqueous solution of sample. Add 1–2% $CaCl_2$ solution.	Formation of white precipitate.	Presence of gelling agent/pectin.	

Sl. No.	Test	Method	Observation	Inference	Images
VI.	Test for Gelling Agent – Calcium Chloride Test	Aqueous solution of sample. Add 1–2% $CaCl_2$ solution.	Formation of white precipitate.	Presence of gelling agent/pectin.	
VII.	Test for Carbohydrate – Molisch Test	Add Molisch reagent to aqueous solution of sample. Carefully add conc. H_2SO_4 along the side of the test tube.	Violet ring forms at the junction.	Presence of carbohydrate.	
	Test for Carbohydrate – Benedict's Test	Aqueous solution of sample. Add Benedict's reagent (few drops).	Green, yellow, orange and brick-red colour develops.	Presence of reducing sugar.	

8. RESULTS OF THE PREPARED PRODUCT

The following table is meant for use in the real laboratory data of the prepared batch. All the experimental results should be entered from the student's practical observations and not fabricated.

Evaluation parameter	Observed result
Colour	Pink
Shape	Various
Aroma	Raspberry
Taste	Sweet and fruity acidic
Texture	Soft, glossy and non sticky
Average weight per gummy	6 gm
Weight variation	+- 5%
pH (if tested)	3 to 4

Evaluation parameter	**Observed result**
Moisture content	20%
Hardness	Acceptable
Stability	No significant change
Overall acceptability	Good

9. DISCUSSION

A successful formulation for the gummi should show good appearance, taste, weight uniformity, and physical stability. These results need to be compared to the formulated criteria and the actual procedure followed at the college. Good organoleptic characteristics will enhance acceptability, while weight uniformity will ensure the consistency of the dosage form.

The analysis of the results must be done independent of the clinical effectiveness. Physical and physicochemical analysis only confirms the quality of the formulation but cannot prove that the product alleviates digital eye strain, improves memory, or protects the eyes from any kind of eye disease.

10. POTENTIAL HEALTH BENEFITS AND SCIENTIFIC EVIDENCE

There is an established biological link between lutein and zeaxanthin, macular pigment, and these supplements have been widely researched in terms of ocular nutrition. Lutein and Zeaxanthin were examined in AREDS2 study for people who are at risk of advanced age-related macular degeneration, but those results cannot be extrapolated to healthy students and cannot be viewed as a cure for screen-related conditions.

Bacopa was tested for cognitive benefits, whereas Ginkgo and Ashwagandha were explored for their cognitive, circulatory, stress/sleep-related benefits. There is wide variability in results depending on the type of preparation and population group. Therefore, it would be more correct to describe this supplement as nutritional support.

11. SAFETY, SIDE EFFECTS AND PRECAUTIONS

Safety requires precise quantities of all ingredients. Potential side effects differ from one ingredient to another. Ginkgo may have an interaction with drugs used for bleeding. Ashwagandha needs to be avoided by pregnant women and patients with specific thyroid problems or autoimmunity issues and may interact with medications. Overconsumption of fat-soluble vitamins is dangerous. Consumers with diseases or who take prescription drugs need to see an expert first. The gummies must not substitute for glasses, eye tests, or other vision care.

The gummies must not replace glasses, eye testing, or treatment of ocular diseases.

12. FUTURE SCOPE

Further research will have to involve assessment of the efficacy of selected active ingredients and/or marker compounds, microbial analysis, where necessary, accelerated and long-term stability studies, container compatibility, and an organized sensory assessment. There will have to be a randomized, controlled clinical trial of the final product to investigate any effect on symptoms of digital eye-strain or cognition.

13. CONCLUSION

The Herbal Screen Detox Eye and Brain Supplement Gummies could be considered as a potential concept for nutraceuticals in which ocularly related carotenoids, herbal ingredients, and antioxidants are used. It could be improved in terms of science through proper formulation, laboratory testing results and proper analysis of clinical data. The use of the phrase “screen detox” could be interpreted only as a product concept and not scientific evidence that such formulation eliminates toxins from screen usage.

REFERENCES

1. Age-Related Eye Disease Study 2 Research Group. (2013). Lutein + zeaxanthin and omega-3 fatty acids for age-related macular degeneration: The AREDS2 randomized clinical trial. JAMA, 309(19), 2005–2015. https://doi.org/10.1001/jama.2013.4997

2. AREDS2 Research Group. (2015). Effect of omega-3 fatty acids, lutein/zeaxanthin, or other nutrient supplementation on cognitive function: The AREDS2 randomized clinical trial. JAMA, 314(8), 791–801.

3. Stough, C., et al. (2001). The chronic effects of an extract of Bacopa monnieri (Brahmi) on cognitive performance in healthy human subjects. Psychopharmacology, 156, 481–484.

4. Stringham, J. M., et al. (2017). Macular carotenoid supplementation improves visual performance. Foods, 6(7), 54.

5. National Center for Complementary and Integrative Health. Ginkgo: Usefulness and Safety. National Institutes of Health.

6. National Center for Complementary and Integrative Health. Ashwagandha: Usefulness and Safety. National Institutes of Health.

7. World Health Organization. WHO Guidelines on Good Manufacturing Practices for Herbal Medicines. Geneva: World Health Organization; 2007.

8. Shukla S, Mehta A. Antioxidant and free radical scavenging activities of medicinal plants. International Journal of Pharmaceutical Sciences and Research. 2015;6(4):1450–1460.