

Herbal Effervescent Tablet for Stress Management: Development and Characterization

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ABSTRACT

Background: Stress management remains a significant therapeutic challenge, necessitating the development of novel delivery systems that enhance patient adherence. This research presents the formulation and characterization of a novel herbal tablet designed for effective stress relief. Effervescent dosage forms are increasingly recognized for their superior bioavailability and ease of administration, making them highly acceptable to patients across all age groups. **Objectives:** In present study, selected herbal ingredients of Tagar (*Valeriana wallichii*; Family: Valerianaceae) and Jatamansi (*Nardostachys jatamansi*; Family: Caprifoliaceae) were standardized and incorporated into an optimized effervescent matrix, adhering to ICH and Ayurvedic Pharmacopoeia of India (API) guidelines for product. **Materials and Methods:** The formulation was subjected to rigorous stability testing for evaluation the therapeutic efficacy, pharmacokinetic potential, the dissolution profile and absorption rates of the active markers were successfully determined and validated using High-Performance Liquid Chromatography (HPLC) methods. **Results:** Experimental results indicated that the effervescent tablet exhibited rapid disintegration and enhanced dissolution characteristics, facilitating efficient drug release compared to conventional solid dosage forms. The pharmacokinetic data, validated through HPLC, confirmed improved bioavailability, suggesting a more rapid onset of action. **Conclusion:** This study successfully bridges the gap between traditional herbal medicine and modern pharmaceutical technology, providing a stable, and scientifically validated delivery system. These findings are useful as scalable and effective alternative product for stress management.

Keywords: Effervescent tablet, Herbal Formulation, HPLC Analysis, Stress Management, Stability.

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INTRODUCTION

World Health Organization has given “Mental Health Action Plan (mhGAP) for the period of 2013-2030,” in which mentioned the role of mental health for achieving all people’s health. According to the summary of this plan, there are 4 major objectives like, Strength and effective leadership for governing mental health; Provision of comprehensive, integrated and responsive mental health as well as and social care to all communities; Implementation of strategies for promotion of mental health; Provision of strong informative systems, evidence and research for mental health (Anonymous, 1976). Similarly, to that, Institute of Health Metrics and Evaluation (2022) has published “the fact sheet,” which was focused on mental disorders. This was based on description given by the International Classification of Diseases in 11th revised volume (ICD-11). This fact sheet had mentioned many mental diseases or illness like, in 2019, 1 person out of 8

people, or approximate 970 million people around the world were living with a mental disorders like anxiety and depressive disorders (Charlson *et al.*, 2019). In 2020, it was mentioned that these anxiety and depressive disorders are because of the COVID-19 pandemic. Though, initially estimated 26%, but later on in 2022, it was increased 28% for anxiety and major depressive disorders.

In 2019, 301 million people includes 58 million children and adolescents were living with an anxiety disorder. Similarly, in 2019, 280 million people includes 23 million children and adolescents were living with depression, in 2019, 40 million people suffered with bipolar disorder. Schizophrenia had affected approximately 24 million people or 1 person out of 300 people worldwide (CCRAS, 2018). In 2019, 14 million people includes almost 3 million children and adolescents had experienced eating disorders. In 2019, 40 million people includes children and adolescents were living with conduct-dissocial disorder, neurodevelopmental disorders, behavioral and cognitive disorders. Above-mentioned disorders were raised during the developmental period and because of that significant difficulties were observed in the acquisition and execution of specific intellectual, motor, language or social functions. It leads the disorders like intellectual development, autism spectrum disorder,



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attention deficit hyperactivity disorder and so on. Charlson *et al.* (2019) had also cited that the prevalence of Post-Traumatic Stress Disorder and other mental disorders was high due to conflict affected settings (Institute of Health Metrics and Evaluation, 2022).

Based on this serious concern for mental health, the research work was selected for relaxation in mental disorders. As per the literature survey on antistress plants, we have selected Tagar (*Valeriana wallichii*; Family: Valerianaceae) and Jatamansi (*Nardostachys jatamansi*; Family: Caprifoliaceae) for its highly promising nervine tonic activities. So, the described plants were selected to formulate “stress reliever” herbal and novel product (Jamal *et al.*, 2022).

MATERIALS AND METHODS

Materials

The materials used for the formulation of herbal effervescent tablets included Tagar extract (*Valeriana wallichii*) and Jatamansi extract (*N. jatamansi*) as the active pharmaceutical ingredients. These herbal extracts were selected based on their reported antistress and neuroprotective properties. The excipients employed in the formulation comprised citric acid, sodium carbonate, sodium bicarbonate, povidone, simethicone, polyethylene glycol, flavoring agent, and purified water. Citric acid and sodium bicarbonate served as effervescent agents responsible for carbon dioxide generation upon contact with water, while povidone was used as a binder to improve tablet integrity. Polyethylene glycol acted as a processing aid, and simethicone was incorporated to reduce excessive foaming during tablet dispersion. The flavoring agent was added to enhance palatability and patient acceptability. All pharmaceutical excipients complied with the specifications of the Indian Pharmacopoeia, whereas the flavoring agent conformed to Food Safety and Standards Authority of India requirements. The selected materials were considered suitable for the development of a stable, effective, and patient-friendly herbal effervescent dosage form (“Mental health and COVID-19”, 2022).

Methods

Selection of Plant materials for its Antistress activities

Two medicinal plants, *V. wallichii* and *N. jatamansi*, were selected for evaluating antistress activity based on their traditional therapeutic use and reported pharmacological properties. *Valeriana wallichii* (Family: Valerianaceae), commonly known as Indian valerian, Muskroot, or Tagar, was utilized in the form of a root extract prepared from its rhizome and root parts. Similarly, *N. jatamansi* (Family: Caprifoliaceae), commonly known as Tapaswani, was selected, and its root extract was used for the study. Both plants have been extensively employed in traditional medicine systems for their calming, adaptogenic, neuroprotective, and stress-relieving effects, making them promising candidates for the investigation of antistress potential (Rahman and Muralidharan, 2010). The root extracts were chosen as the sample products because these plant parts are known to contain significant concentrations of bioactive phytoconstituents responsible for their therapeutic activity.

Selection of Dosage form

Day to day focus on development of novel formulations in Nutraceuticals and Herbal medicines for health and wellness. There is a continuous demand in market for convenient and palatable delivery systems of herbal medicines, which have to significantly increase the interest in development of herbal ayurvedic effervescent tablet as an alternate to conventional dosage forms. Effervescent tablet formulations are convenient and easily applied method with herbal extracts. The advantages of effervescent tablets are like its rapid disintegration of tablet, formation of a palatable and refreshing solution after mixing with saliva, better drug absorption due to releasing of carbon dioxide, these type tablets are formulated with a mixture of acids and bases, which reacts in the presence of water and production of carbon dioxide gas, which leads to rapid dissolution of the active ingredients, not required to swallow tablet, with prompt and fast onset of actions, always good for stomach and intestinal tolerance, more portability, with accurate dosing and useful to

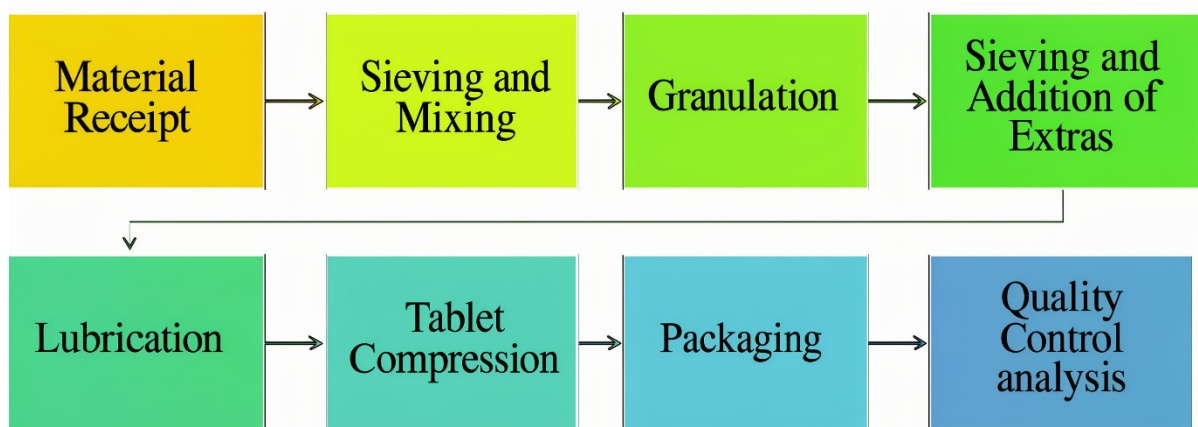


Figure 1: Step-by-Step Procedure of effervescent tablet.

improve therapeutic effects. With focus on above-mentioned advantages, the herbal extracts were selected for the formulation of effervescent tablet as a part of research. Figure 1 shows step-by-step procedure of effervescent tablet while Figure 2 shows picture of effervescent tablet. Table 1 shows the result of trial herbal effervescent tablets formulation.

Evaluation of Prepared Tablet

Evaluation of Herbal Effervescent Tablets

The prepared herbal effervescent tablets were evaluated for their physico-chemical and performance characteristics according to standard pharmacopeial procedures. Tablet appearance, color, odor, and surface texture were visually examined. Weight variation was determined by individually weighing 20 tablets and calculating the average weight and percentage deviation. Tablet hardness was measured using a hardness tester and expressed in kg/cm². Friability was assessed using a Roche friabilator operated at 25 r.p.m. for 4 min, and the percentage weight loss was calculated. Tablet thickness and diameter were measured using a digital vernier caliper ("Mental health and COVID-19", 2022).

The effervescent properties were evaluated by determining the effervescence time and dispersion time. Effervescence time was recorded as the time required for complete cessation of carbon dioxide evolution when a tablet was placed in a specified volume of water at room temperature. The pH of the resulting solution was measured using a calibrated digital pH meter. Moisture content was determined to assess the stability of the formulation (Rahman and Muralidharan, 2010). Drug content or herbal extract content uniformity was evaluated by appropriate analytic methods to ensure uniform distribution of active ingredients. Additionally, organoleptic properties, including taste and mouthfeel of the reconstituted solution, were assessed to determine patient acceptability. The optimized formulation was selected based on satisfactory mechanical strength, rapid effervescence, acceptable pH, content uniformity, and overall stability ("The Ayurvedic Pharmacopoeia of India (API) (2000; 2003; 2007; 2008): Appendix part-II", n.d.).

Stability Study

As per the Accelerated stability protocol, effervescent tablet was kept in stability chamber at 40°C±2 and 75±5% relative humidity. Packed, intact with complete label were kept in stability chamber ("The Ayurvedic Pharmacopoeia of India (API)", 2008). Total storage period in stability chamber for accelerated stability was continued up to 6 months and time to time analysis were done at 0, 3, 6 months, with prescribed parameters as per CCRAS guideline and Ayurvedic Pharmacopoeia of India (API). The compiled data were collected and compared. The results were interpreted like, variation should not be more than 25%. Once product complies, then the expiry period or shelf life can be



Figure 2: Picture of effervescent tablet.

Table 1: Herbal effervescent tablets formulation.

Herbal effervescent tablets formulation		
Ingredient	Reference standard	Trial batch (mg/tab)
Active ingredients		
TAGAR extract	0	200
Jatamasi extract	0	100
Excipients		
Citric acid	1700	1444
Sodium carbonate	507	374
Sodium bicarbonate	508	574
Povidone	15	20
Simethicone	"The Ayurvedic Pharmacopoeia of India (API) (2000; 2003; 2007; 2008): Appendix part-II" (n.d.)	8
PEG	25	30
Water	QS	QS
Preservatives/flavor		
Sodium benzoate	35	35
Flavour natural	QS	QS
Grand total approx	3,400	3,400
Remarks	Reference Standard, natural flavor essence	Strong fizz, more carbonate load produced strong effervescence

PEG: Polyethylene Glycol.

claimed for 24-36 months ("The Ayurvedic Pharmacopoeia of India (API)", 2008).

As per the Real time stability protocol, effervescent tablet was kept ambient room temperature. Samples must be packed and intact with complete label. Total storage period for Real time stability was continued up to 6 months and time to time analysis were done at 0, 1, 6 months, with prescribed parameters as per ICH guideline and prescribed parameters by CCRAS ("The Ayurvedic Pharmacopoeia of India (API)", 2008-16).

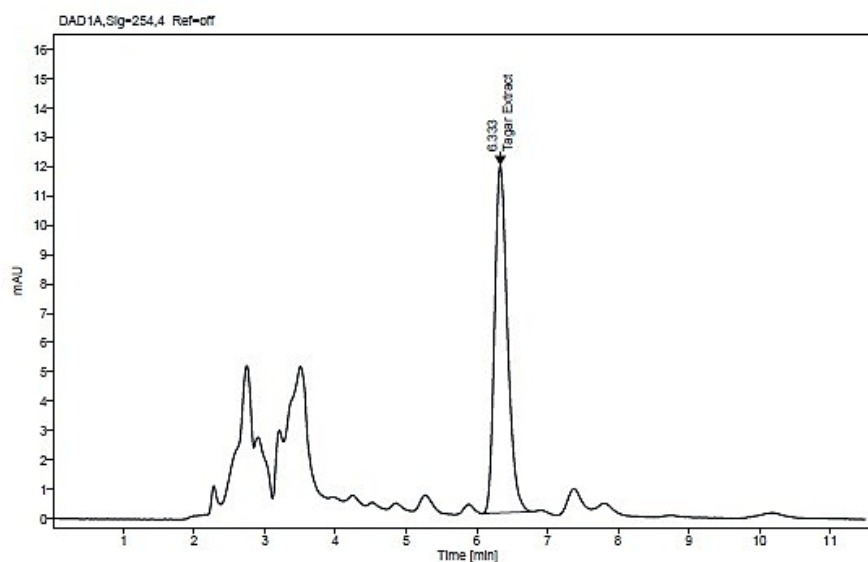
RESULTS AND DISCUSSION

Certified Plant Raw Materials Extracts of Tagar and Valleriana Was Procured from Konark Herbals and Healthcare

As per Certificate of Analysis of Jatamansi dry extract, physico-chemical parameters of identification, loss on drying, pH of 1% solution, water soluble extractive, and Assay of Jatamansone by gravimetric method were within the limit. Heavy metals (lead, cadmium, mercury and arsenic) were compiled within specification limit of API. Microbiological analysis like total bacterial count, total fungal count and qualitative performance of pathogens like *Escherichia coli*, *Salmonella* ssp., *Staphylococcus* ssp., *Pseudomonas* ssp. Were within the specification limit of API.

With these results of herbal extract, the literature was surveyed and studied the following research paper by Rehman and Murlidharan (2010). They had studied antidepressant activity of methanolic extract of *N. jatamansi* applying and measuring by forced swim test, tail suspension test and locomotor activity in inbred male Swiss mice. They had proved efficacy of extract with the dose of 200 and 400 mg kg⁻¹ p.o., which was compared against the standard drug that is, imipramine, 10 mg kg⁻¹ in normal and sleep deprived mice. The results showed that *N. jatamansi* extract at the dose of 200 and 400 mg kg⁻¹ p.o. produced significant changes in locomotor functions of mice as compared to normal control. However, it was significantly ($p < 0.01$) improving the locomotor activity in case of sleep deprivation which is comparable to normal control. They concluded that *N. jatamansi* had dose dependent antidepressant activity and can also be used in patients suffering from depression due to sleep disturbances ("The Ayurvedic Pharmacopoeia of India (API)", 2008).

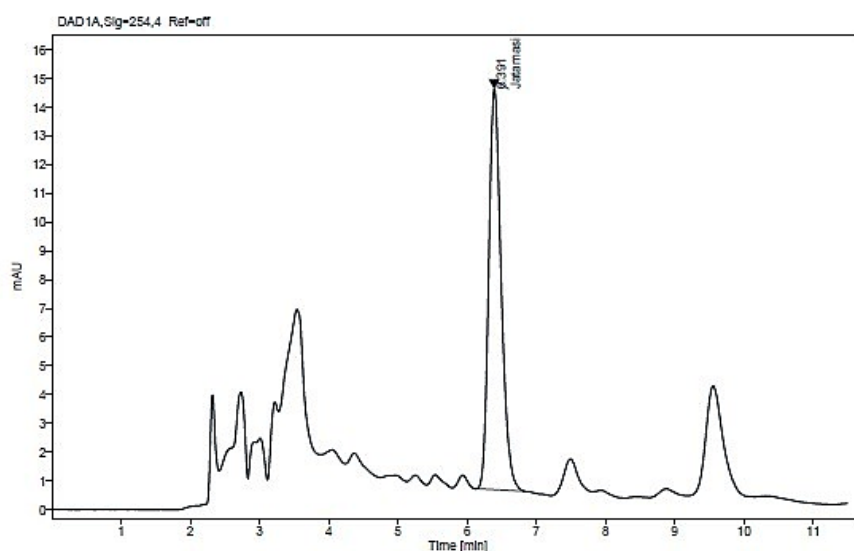
As per Certificate of Analysis of Tagar dry extract, physico-chemical parameters of identification, loss on drying, pH of 1% solution, water soluble extractive, and Assay of valeric acid by titrimetric method were within the limit. Heavy metals (lead, cadmium, mercury and arsenic) were compiled within specification limit of API. Microbiological analysis like total bacterial count, total fungal count and qualitative performance



Signal: DAD1A,Sig=254,4 Ref=off

Sample Name	RT [min]	Area	Height	Compound Concentration	Width [min]	Area%
Standard	6.333	149.6233	11.8334		0.6866	100.0000
	Sum	149.6233				

Figure 3a: High-Performance Liquid Chromatography (HPLC) Chromatogram of Tagar extract as standard.



Signal: DAD1A, Sig=254.4 Ref=off

Sample Name	RT [min]	Area	Height	Compound Concentration	Width [min]	Area%
Jatamasi_Standard	6.391	173.2390	13.9341		0.6894	100.0000
	Sum	173.2390				

Figure 3b: High-Performance Liquid Chromatography (HPLC) Chromatogram of Jatamansi extract as standard.

Table 2: Evaluation of Herbal Effervescent tablet by Accelerated Stability (As per Ayurvedic Pharmacopoeia of India [API] guideline) and Parameters protocol selection (as per CCRAS).

Name of product	Herbal effervescent tablet				
Mode of packing	HDPE bottle				
Analysis at	Altra Analytical Laboratories				
Stability condition	At temperature 40±2°C; RH 75±5% in Stability chamber				
Particular	Criteria	Observations			Remark
Report number	At actual	AAL/A/ 250501/008	AAL/A/ 250602/004	AAL/A/ 251101/032	-
Stability time period	Accelerated	0 months	3 months	6 months	OK
Condition of material	Satisfactory	satisfactory	satisfactory	satisfactory	OK
Analysis start date	At actual	1/5/2025	2/6/2025	1/11/2025	OK
Analysis End date	At actual	7/5/2025	9/6/2025	7/11/2025	OK
Parameters	Specification	Observations			Acceptance
Description	Effervescent tablet	effervescent tablet	effervescent tablet	effervescent tablet	complies
pH (10% solution)	4.5-5.5	5.137	5.140	5.146	complies
Average weight	NLT 4.0 g	4.5131 g	4.5133 g	4.5021 g	complies
Disintegration time	NMT 5 min	1 min, 8 sec	1 min, 11 sec	1 min, 9 sec	complies
Measurement of carbon dioxide	NLT 1 g	3.0267 g	3.0417 g	3.673 g	complies
Hardness	NMT 4 kg/cm ³	1.5 kg/cm ³	2 kg/cm ³	2.3 kg/cm ³	complies
Loss on drying	NMT 2%	0.86%	0.80%	0.71%	complies

Name of product	Herbal effervescent tablet				
Total ash	NMT 50%	41.83%	40.77%	41.89%	complies
Acid insoluble ash	NMT 20%	12.34%	11.63%	11.65%	complies
Disintegration time	NMT 5 min	1 min, 8 sec	1 min, 11 sec	1 min, 9 sec	complies
Heavy metals					
Lead	NMT 10 parts per million	not detected	-	-	complies
Arsenic	NMT 3.0 parts per million	not detected	-	-	complies
Mercury	NMT 1.0 parts per million	not detected	-	-	complies
Cadmium	NMT 0.3 parts per million	not detected	-	-	complies
Microbial contamination					
Total bacterial count	NMT 100000 c.f.u./g	6,564 colony-forming units/g	2,208 colony-forming units/g	1,647 colony-forming units/g	complies
Total fungal count	NMT 1,000 colony-forming units/g	nil c.f.u./g	nil c.f.u./g	nil c.f.u./g	complies
<i>E. coli</i>	absent	absent	absent	absent	complies
<i>Salmonella</i>	absent	absent	absent	absent	complies
<i>Staphylococcus aureus</i>	absent	absent	absent	absent	complies
<i>Pseudomonas aeruginosa</i>	absent	absent	absent	absent	complies

of pathogens like *E. coli*, *Salmonella* ssp., *Staphylococcus* ssp., *Pseudomonas* ssp. Were within the specification limit of API. Based on these results, the similar research paper was studied for the chemical constituents of *V. wallichii* and its properties by Jamal *et al.* (2022) ("The Ayurvedic Pharmacopoeia of India (API)", 2008).

Stability Study (Accelerated and Real Time)

Both Stability study of herbal effervescent tablet was performed at Altra analytic laboratories (AYUSH approved, license no. GATL/04), Ahmedabad, Gujarat.

As per the Accelerated stability protocol (API, 2000-2016), effervescent tablet was kept in stability chamber at $40^{\circ}\text{C}\pm 2$ and 75 ± 5 relative humidity. Packed, intact with complete label were kept in stability chamber. Total storage period in stability chamber for accelerated stability was continued up to 6 months and time to time analysis were done at 0, 3, 6 months, with prescribed parameters as per CCRAS guideline (2018) and API. The compiled data were collected and compared that results variation was not more than 25%. So, the product was compiled the accelerated stability, means the expiry period or shelf life shall be claimed for 24-36 months. Table 2 shows the results of evaluation of Herbal Effervescent tablet by Accelerated Stability ("The Ayurvedic Pharmacopoeia of India (API)", 2008).

As per the Real time stability protocol, effervescent tablet was kept ambient room temperature. Samples were packed and intact

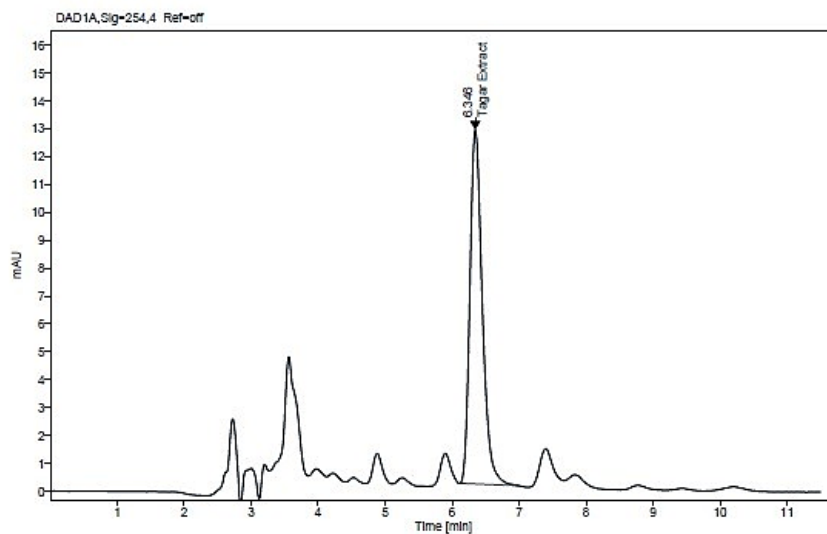
with complete label. Total storage period for Real time stability was continued up to 6 months and time to time analysis were done at 0, 1, 6 months, with prescribed parameters as per ICH guideline and prescribed parameters by CCRAS. The compiled data were collected and compared that results variation was not more than 25%. So, the product was compiled the accelerated stability, means the expiry period or shelf life shall be claimed for 24-36 months. Table 3 shows evaluation of Herbal Effervescent tablet by Real Time Stability.

High-Performance Liquid Chromatography (HPLC) Study

Ingredients percentage were considered against 100% of Standard. Both extracts/ingredients are water soluble and detected/absorbed at same wavelength (254 nm). So, significant with product absorption wavelength (254 nm). Proportion ratio in product was Ratio 11: 9 (Tagar; Jatamansi). Table 4 shows HPLC results of Ingredients' availability in Effervescent Tablet. Figures 3a and 3b shows the HPLC Chromatogram of Tagar extract as standard and HPLC Chromatogram of Jatamansi extract as standard. While Figures 4a and 4b, shows Chromatogram of Tagar extract in Effervescent Tablet and Chromatogram of Jatamansi extract in Effervescent Tablet. The HPLC analysis of the herbal effervescent tablet demonstrated satisfactory incorporation of both Tagar and Jatamansi extracts. Tagar extract showed a peak area of 149.6233 at 254 nm, while the corresponding effervescent tablet exhibited a peak area of 162.2366, indicating an ingredient concentration

Table 3: Evaluation of Herbal Effervescent tablet by Real Time Stability (As per ICH guideline) and Parameters protocol selection (as per CCRAS).

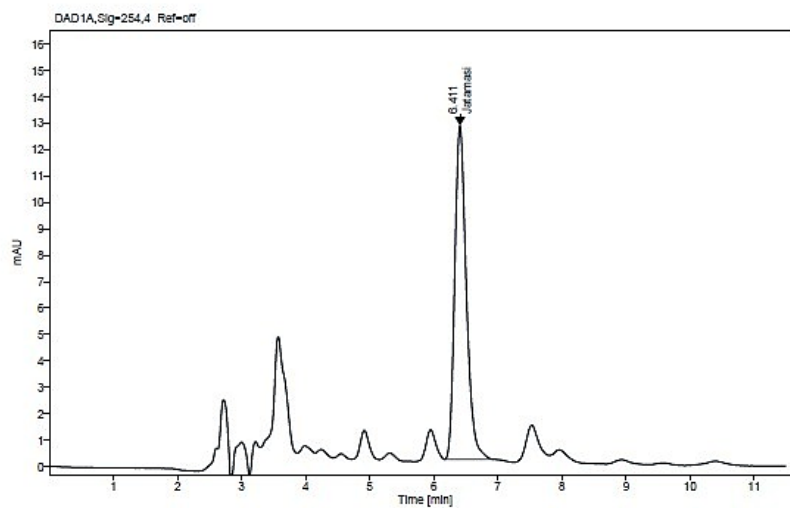
Name of product	Herbal effervescent tablet				
Mode of packing	HDPE bottle				
Analysis at	Altra Analytical Laboratories				
Stability condition	at Ambient room temperature				
Particular	Criteria	Observations			Remark
Report number	at actual	AAL/A/ 250501/008	AAL/A/ 250602/010	AAL/A/ 251101/034	-
Stability time period	real time	0 months	1 month	6 months	OK
Condition of material	satisfactory	satisfactory	satisfactory	satisfactory	OK
Analysis start date	at actual	1/5/2025	2/6/2025	1/11/2025	OK
Analysis End date	at actual	7/5/2025	9/6/2025	7/11/2025	OK
Parameters	Specification	Observations			Acceptance
Description	effervescent tablet	effervescent tablet	effervescent tablet	effervescent tablet	complies
pH (10% solution)	4.5-5.5	5.137	5.137	5.146	complies
Average weight	NLT 4.0 g	4.5131 g	4.5133 g	4.5021 g	complies
Disintegration time	NMT 5 min	1 min, 8 sec	1 min, 8 sec	1 min, 9 sec	complies
Measurement of carbon dioxide	NLT 1 g	3.0267 g	3.0292 g	3.673 g	complies
Hardness	NMT 4 kg/cm ³	1.5 kg/cm ³	1.5 kg/cm ³	2.3 kg/cm ³	complies
Loss on drying	NMT 2%	0.86%	0.89%	0.87%	complies
Total ash	NMT 50%	41.83%	40.65%	40.92%	complies
Acid insoluble ash	NMT 20%	12.34%	12.49%	12.51%	complies
Disintegration time	NLT 40%	45.49%	44.62%	44.48%	complies
Heavy metals					
Lead	NMT 10 parts per million	not detected	-	-	complies
Arsenic	NMT 3.0 parts per million	not detected	-	-	complies
Mercury	NMT 1.0 parts per million	not detected	-	-	complies
Cadmium	NMT 0.3 parts per million	not detected	-	-	complies
Microbial contamination					
Total bacterial count	NMT 100000 c.f.u./g	6,564 colony-forming units/g	2,376 colony-forming units/g	1,624 colony-forming units/g	complies
Total fungal count	NMT 1,000 colony-forming units/g	nil c.f.u./g	nil c.f.u./g	nil c.f.u./g	complies
<i>E. coli</i>	absent	absent	absent	absent	complies
<i>Salmonella</i>	absent	absent	absent	absent	complies
<i>S. aureus</i>	absent	absent	absent	absent	complies
<i>P. aeruginosa</i>	absent	absent	absent	absent	complies



Signal: DAD1A,Sig=254,4 Ref=off

Sample Name	RT [min]	Area	Height	Compound Concentration	Width [min]	Area%
E.Tab	6.346	162.2366	12.6731		0.8799	100.0000
	Sum	162.2366				

Figure 4a: Chromatogram of Tagar extract in Effervescent Tablet.



Signal: DAD1A,Sig=254,4 Ref=off

Sample Name	RT [min]	Area	Height	Compound Concentration	Width [min]	Area%
E.Tab	6.411	158.1263	12.6157		0.7609	100.0000
	Sum	158.1263				

Figure 4b: Chromatogram of Jatamansi extract in Effervescent Tablet.

Table 4: HPLC results of Ingredients' availability in Effervescent Tablet.

Sl. No.	Name of standard	Wavelength	Area of peak	Availability of ingredient in product (p.p.m.)	Absorption%
1.	Tagar Extract	Absorption at 254 nm	Area covered 149.6233	-	-
	In effervescent tablet	Absorption at 254 nm	Area covered 162.2366	1,084.30 parts per million	108.43%
2.	Jatamansi extract	Absorption at 254 nm	Area covered 173.2390	-	-
	In effervescent tablet	Absorption at 254 nm	Area covered 158.1263	912.76 parts per million	91.28%

of 1,084.30 parts per million and an absorption value of 108.43%. Similarly, Jatamansi extract displayed a peak area of 173.2390 at 254 nm, whereas the effervescent tablet showed a peak area of 158.1263, corresponding to an ingredient concentration of 912.76 parts per million and an absorption value of 91.28%. These results confirm the successful incorporation and acceptable recovery of both herbal constituents within the formulated effervescent tablets, indicating good content uniformity and formulation integrity.

CONCLUSION

With the above study, we can conclude that the results may vary from batch to batch and/or lot to lot. The quality parameter testing is important attribute to cater the better products to the society. Once quality parameters are defined and results are within the specifications, we may conclude that products shall be promising and effective for stress management. The formulation demonstrated acceptable physico-chemical properties, rapid effervescence, and satisfactory stability under accelerated storage conditions. HPLC analysis confirmed the presence and adequate recovery of the active herbal constituents, indicating good content uniformity and formulation integrity. The accelerated stability study showed that the product remained stable in HDPE packaging under prescribed conditions. Overall, the developed herbal effervescent tablet represents a promising, patient-friendly dosage form with potential therapeutic benefits and enhanced convenience, warranting further clinical evaluation.

ACKNOWLEDGEMENT

We are thankful to Konark Herbals and Healthcare for providing us certified raw materials. Also thankful to Hetal Pharmaceuticals, Gujarat for formulating novel products from initial to final

finished goods and thankful to Altra Analytical Laboratories, Ahmedabad for performing the stability studies.

ABBREVIATIONS

HPLC: High-Performance Liquid Chromatography; **API:** Ayurvedic Pharmacopoeia of India; **ICH:** International Council for Harmonisation; **CCRAS:** Central Council for Research in Ayurvedic Sciences; **WHO:** World Health Organization; **HDPE:** High-Density Polyethylene; **ICD-11:** International Classification of Diseases, 11th Revision; **mhGAP:** Mental Health Action Plan; **GHDx:** Global Health Data Exchange; **QS:** Quantum Satis.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

REFERENCES

- Anonymous (1976). The wealth of India, A Dictionary of India Raw materials, and Industrial Products, X (pp. 424-426). New Delhi, Delhi, India: CSIR
- CCRAS (2018). General Guidelines for Drug Development of ayurvedic Formulations; Guideline Series, 1 to 3; By CCRAS.
- Charlson, F., Van Ommeren, M., Flaxman, A., Cornett, J., Whiteford, H., & Saxena, S. (2019). New WHO prevalence estimates of mental disorders in conflict settings: A systematic review and meta-analysis. *Lancet*, 394(10194), 240-248. doi: 10.1016/S0140-6736(19)30934-1, PubMed: 31200992
- Institute of Health Metrics and Evaluation (2022). Global Health Data Exchange (GHDx). Retrieved from <https://vizhub.healthdata.org/gbd-results/>
- Jamal, G., Rabea, P., Mohammad, A. K., Srivastava, V., Mustafa, S., Ahmad, S. & Husain, S. A., et al. (2022). A review on Valeriana wallichii: Chemical composition and pharmacological research. *Current Traditional Medicine*, 2022, 9(4), 55-71.
- Mental health and COVID-19 (2022): Early evidence of the pandemic's impact. Geneva: World Health Organization (WHO)
- Rahman, H., & Muralidharan, P. (2010). Comparative study of antidepressant activity of methanolic extract of *N. Jatamansi* DC Rhizome on normal and sleep deprived mice. *Pharmacia Lettre*, 2(5), 441-449
- The Ayurvedic Pharmacopoeia of India (API) (2000; 2003; 2007; 2008): Appendix Part-II, Volume-I, no. 1-11.
- The Ayurvedic Pharmacopoeia of India (API) (2008). Part-II, Volumes I to III.
- The Ayurvedic Pharmacopoeia of India (API) (2008): Appendix Part-I, Volumes I to V.
- The Ayurvedic Pharmacopoeia of India (API) (2008-16). Participant journal, Volumes I to IX.

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