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ANALYTICAL VALIDATION OF "AMALAKYAVALEHA" PREPARED AS MENTIONED IN CLASSICAL TEXT 'YOGARATNAKARA'

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ABSTRACT

Amalakyavaleha is a classical Ayurvedic formulation widely used for its Rasayana (rejuvenating), nutritive, and therapeutic properties. The increasing global acceptance of Ayurvedic medicines has emphasized the need for scientific validation and standardization of traditional formulations to ensure their quality, safety, and efficacy. The present analytical study focuses on the quality control i.e. physico-chemical evaluation of Amalakyavaleha prepared according to classical Ayurvedic principles. The study was conducted at ALN Rao Memorial Ayurvedic Medical College and PG Centre, Koppa, Karnataka, following the guidelines of the Central Council for Research in Ayurvedic Sciences (CCRAS), Ministry of AYUSH, Government of India.

The analytical findings provide scientific evidence supporting the quality and standardization of Amalakyavaleha. Standardization of Ayurvedic formulations through modern analytical techniques ensures therapeutic reliability, and global acceptance of traditional medicines. The study highlights the importance of integrating classical Ayurvedic knowledge with contemporary scientific methods for the development of safe, effective, and standardized herbal formulations.Organoleptic parameters such as colour, odour, taste, and consistency were assessed to determine the physical characteristics of the formulation. Physico-chemical analysis included evaluation like determination of Loss on drying, Total ash value, Acid insoluble ash, Water soluble ash, pH value, Extractive values, Sugar estimation, and Chromatographic evaluation. These parameters help establish the identity, purity, stability, and quality of the formulation. Biological evaluation, including microbial limit tests and tests for specific pathogens, was also performed to ensure safety and absence of microbial contamination.

INTRODUCTION

Ayurveda, the ancient system of medicine, has always emphasized the preparation and administration of medicines with utmost care to ensure safety, efficacy, and therapeutic value. In the modern era, however, the global acceptance of Ayurvedic formulations depends not only on their traditional reputation but also on scientific validation through standardized quality control methods. Herbal formulations are widely used for preventive, promotive, and curative purposes, and therefore maintaining their quality has become a major responsibility for researchers and manufacturers.

Amalakyavaleha is prepared mainly using Amalaki, commonly known as Indian gooseberry, which is highly valued in Ayurveda due to its rich nutritional content and Rasayana (rejuvenating) effect. Since herbal drugs are natural products, their quality may vary depending on factors such as geographical source, storage conditions, processing methods, and environmental contamination. Hence, scientific evaluation and standardization are necessary to ensure consistency and reliability.

Evaluation of Herbal Formulations

The evaluation of herbal formulations can generally be carried out under four major categories:

1. Organoleptic evaluation
2. Physico-chemical evaluation
3. Biological evaluation
4. Quantitative estimation

Each of these methods contributes significantly to the standardization of the formulation.

ORGANOLEPTIC CHARACTERS

Sl. No.	Parameters	Appearance of Specimen Sample
1.	Colour	Reddish brown
2.	Odour	Aromatic
3.	Taste	Sweet, sour, pungent, bitter
4.	Texture	Semi-solid

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PHYSICO-CHEMICAL PARAMETERS

Sl. No.	Test Parameters	Results	Normal Range Acc. To API
1.	Loss on Drying at 105°C	8.28%	5%-10%
2.	Total ash	14.23 %	Not more than 20% w/w
3.	Acid insoluble ash	0.85%	0.1%-1%
4.	Water soluble ash	2.22 %	1%-5%
5.	Alcohol soluble extractives	29.8-%	20%-60%
6.	Water soluble extractives	49.66 %	40%-80%
7.	pH (5% aqueous solution)	3.56 ± 0.10	4.0-6.5
8.	Total Sugar	63.25 %	50%-80%
9.	Non-reducing Sugar	25.41 %	10%-40%
10	Reducing Sugar	37.84 %	20%-60%

FLUORESCENT TESTS:

Sl. No.	Parameters	Under Visible Light	Under Long UV
1.	Sample + water	Light yellow	Fluorescent yellow
2.	Sample + MeOH	Creamish yellow	Creamish yellow
3.	Sample + 10% NaOH	Reddish brown	Fluorescent green
4.	Sample + 10% HCl	Brownish yellow	Fluorescent yellow
5.	Sample + 10% HNO_3	Reddish-yellow	Fluorescent green
6.	Sample + 10% H_2SO_4	Mud grey	Fluorescent yellow
7.	Sample + 10% NH_3	Dark brown	Brown

THIN LAYER CHROMATOGRAPHY

Solvent System: Toluene: Ethyl acetate: 9:1

Sl. No.	Rf Values	Under Long UV
1.	0.04	Fluorescent cream
2.	0.11	Light fluorescent red
3.	0.15	Light brown red
4.	0.21	Light fluorescent red
5.	0.32	Red
6.	0.36	Light brown
7.	0.43	Light blue
8.	0.51	Fluorescent brown
9.	0.64	Fluorescent blue
10.	0.68	Fluorescent brown
11.	0.72	Fluorescent blue
12.	0.81	Bright fluorescent green

PRELIMINARY PHYTOCHEMICAL TESTS (QUALITATIVE TESTS)

Sl. No.	Test Parameters	Results
1.	Carbohydrate	Present
2.	Protein	Present
3.	Alkaloid	Present
4.	Cardiac glycoside	Present
5.	Flavonoids	Present
6.	Tannins	Present
7.	Antraquinone glycoside	Present
8.	Triterpenoides	Present

MICROBIAL CONTAMINATION

Sl. No.	Test Parameters	Results
1.	Total aerobic count	1.3×10^2 CFU
2.	Total fungal count	1.2×10^2 CFU

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Quantitative Estimation

Parameters	Results	Normal Range Acc.to API
Total sugar	63.25%	50%-80%
Reducing sugar	25.41%	10%-40%
Non- reducing sugar	37.84%	20%-60%

SIGNIFICANCE OF ANALYTICAL STANDARDIZATION

Analytical standardization plays a crucial role in preserving the credibility and scientific acceptance of Ayurveda. Through systematic evaluation, researchers can establish reproducible standards for herbal formulations.

Standardization helps in:

- Ensuring consistency
- Confirming identity and purity
- Detecting adulteration and contamination
- Improving safety and efficacy
- Enhancing global acceptance of Ayurvedic medicines
- Supporting evidence-based research

Modern analytical methods complement traditional Ayurvedic knowledge and help bridge the gap between ancient wisdom and contemporary science.

CONCLUSION

The quality control and physico-chemical analysis of Amalakyavaleha highlights the importance of scientific evaluation in Ayurvedic pharmaceutical preparations. Traditional organoleptic examination, combined with modern analytical techniques, provides a comprehensive approach for assessing the identity, purity, safety, and efficacy of the formulation.

Parameters such as loss on drying, ash value, pH determination, extractive values, sugar estimation, chromatographic analysis, and microbial testing comes under normal range of Avaleha according to API collectively contribute to establishing quality standards for Amalakyavaleha ensuring safety, consistency, and effectiveness . This serve as a safe and effective therapeutic formulation in both traditional and modern healthcare practices.These tests not only ensure therapeutic reliability but also increase confidence among healthcare professionals and patients.