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# Physico-Chemical and Preliminary Phytochemical Analysis of Amrabeejadi Lepa A Polyherbal Formulation

***Dr. Baby Ganeriwala[1], Dr. K. S. Gudaganatti.[2], Mr. U B Bolmal,[3] Dr. R.S. Hiremath[4]***

[1]Department of Agada Tantra, Raghunath Ayurveda Mahavidyalaya & Hospital, Contai, India,

[2]Department of Rasa shastra & Bhaishajya Kalpana, K.L.E.U Shri B.M.K Ayurveda Mahavidyalaya, Post Graduate Studies and Research Centre, Belgaum, India

[3]Department of Pharmaceutics, K.L.E.U'S College Of Pharmacy, Belgaum, India,

[4]Department of Rasa shastra and Bhaishajya kalpna, K.L.E.U Shri B.M.K Ayurveda Mahavidyalaya, Post Graduate Studies and Research Centre, Karnataka, India.

***Abstract: An Ayurvedic medicine Amrabeejadi lepa is a polyherbal formulation containing Amra beeja majja (Mangifera indica) and Haritaki (Terminalia Chubela). This formulation is effective in the management of daruna darunaka roga (Severe dandruff). The values obtained after the analysis of physico-chemical properties were found to be significant and within the limits. The preliminary phytochemical analysis study revealed that individual drug of Amrabeejadi lepa has shown the presence of organic elements viz., carbohydrates, reducing sugar, mucilage, tannins, alkaloids, steroids, flavonoids and inorganic elements like sodium, iron, phosphate, sulphate, chloride, carbonates and nitrites qualitatively.***

***Keywords: - Amra beejadi lepa, Polyherbal formulation, Physico-chemical and Phytochemical analysis.***

## Introduction

India has rich cultural heritage of traditional medicines which chiefly comprised the two widely flourishing system of treatments i.e. Ayurveda and Unani systems since ancient times. The development of these traditional systems of medicine with the perspective of safety, efficacy and quality will help not only traditional heritage but also rationalize the use of natural products and health care. For herbal Formulations, one must has profound knowledge of important herbs found in India which are widely used in Ayurvedic formulations. Hence, there is need to explore the medicinally important plants; this can be achieved only when herbal products are screened by using sophisticated modern techniques. Amrabeejadi lepa churna is a herbal formulation consisting of two herbal ingredients 1.Amrabeeja (*Mangifera indica*), 2.Haritaki (*Terminalia Chubela*). It is used in the conditions like darunaka (dandruff).[1]

There is scope to explore hidden, not highlighted, highly efficacious formulations mentioned in the classical Ayurvedic texts by analyzing them and establishing their results. The physico-chemical and preliminary phyto-chemical properties help to understand their various uses in different diseases. With the same aim this study has been undertaken.

## Materials and method

### Collection and Procurement of Materials:

Amrabeejadi lepa churna consists of 2 ingredients, viz., Amrabeeja (*Mangifera indica*), and Haritaki (*Teminalia chubela*). Amra beeja majja was collected from the local garden of Nanded, Maharastra. Haritaki was procured from GMP certified K.L.E.S Ayurvedic Pharmacy Belgaum.

### Authentication of raw drugs

Amra beeja majja and Haritaki phala majja authentication were carried out in AYUSH approved drug testing laboratory, (CRL), KLEU Shri BMK Ayurved Mahavidhyalaya by the expert in this field.


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**Preparation of churna[2]**

The Amrabeejadi lepa churna was prepared by adopting standards of Churna Kalpana as per the specifications under the supervision of experts. Here Amra beeja majja and Haritaki were used in the ratio of 1:1.

**Physico-chemical studies[3]**

Physico-chemical studies carried out were Loss on drying at 105 $^0$ C, Total ash, Acid insoluble ash, Water soluble ash, Alcohol and Water soluble extractives & pH. Results showed below in tables.

**Table 1: Organoleptic properties of Amrabeejadi lepa churna.**

| Appearance | Colour | Odour | Taste | Touch |
|---|---|---|---|---|
| Churna | Yellowish Brown | Characteristic Haritaki smell | Bitter | Soft |

**Table 2: Physico chemical characteristics of Amrabeejadi lepa churna.**

| Sl.No | Parameter | Percentage mean |
|---|---|---|
| 1 | Moisture content | 12.8% |
| 2 | Ash content (w/w %) | 2% |
| 3 | Acid insoluble ash (w/w %) | 1% |
| 4 | Water soluble ash (w/w %) | 0.03% |
| 5 | Alcohol soluble extractive (w/w %) | 43.2% |
| 6 | Water soluble extractive (w/w %) | 39.2% |
| 7 | $p^H$ | 3 |

**Determination of physical characteristics of powder formulation[4,5]**

Physical characteristics like bulk density, tap density, angle of repose, Haustner ratio and Carr's index were determined

The term bulk density refers to the method used to indicate packing of particles or granules. The equation for determining bulk density ($D_b$) is $D_b = M/V_b$ where M is the mass of particles and $V_b$ is the total volume of packing. The volume of packing can be determined in an apparatus consisting of graduated cylinder mounted on mechanical tapping device that has a specially cut rotating can. Particular weight of formulation powder was taken and carefully added to cylinder with the aid of a funnel. The initial volume was noted and sample was then tapped until no further reduction in volume was noted. The initial volume gave the bulk density value and after tapping the volume reduced, giving the value of tapped density. Angle of repose has been used as an indirect method quantifying powder flowability, because of its relationship with inter particle cohesion. The fixed funnel and the free standing cone method employs a method that is secured with its tip at a given height (H), above the glass paper that is placed on a flat horizontal surface. Powder or granules were carefully poured through the funnel until the apex of the conical pile just touched the tip of funnel. Thus, with R being the radius of the conical pile Tan a =H/R or a= arc tan H/R, where a is the angle of repose. Haustner ratio is related to inter particle friction and as such can be used to predict the powder flow properties. The equation for measuring haustner ratio is $D_f / D_b$.
Where, $D_f$ = Tapped density and $D_o$ = Bulk density.


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Carr's index is another indirect method of measuring the powder flow from bulk density. The equation for measuring Carrs's index is

$$\text{CARRS INDEX - I} = \left( \frac{D_f - D_b}{D_f} \right) \text{X } 100$$

Where $D_f$ = tapped density, $D_b$= Bulk density

**Table 3: Physical characteristics of the Amrabeejadi lepa churna**

| Sl.no | Parameter | Amrabeeja churna | Haritaki chuirna | Amrabeejadi lepa churna Mean (n=5) ± SD |
|---|---|---|---|---|
| 1 | Angle of repose | $50^0$ | $39^0$ | $47^o$ ± 0.02 |
| 2 | Bulk density | 0.43 | 0.58 | 0.51 ± 0.076 ($g/cm^3$) |
| 3 | Tapped density | 0.52 | 0.83 | 0.59 ± 0.008 ($g/cm^3$) |
| 4 | Carrs index | 17.31 | 30.12 | 13.56% ± 3.275 |
| 5 | Haustners ratio | 1.21 | 1.43 | 1.16 ± 0.042 |

**Preliminary Phytochemical analysis[6]**

Preliminary qualitative phytochemical analysis of inorganic elements like calcium, magnesium, iron, phosphate etc. and organic elements like Carbohydrates, Flavonoids, Glycosides, Steroids, Alkaloids, tannins were done in alcoholic extract of Amrabeejadi lepa churna. Results showed below in tables.

**Table -4:- Showing test for Inorganic components of Amrabeejadi lepa**

| Sl. No | Test | AB lepa |
|---|---|---|
| 01 | Test for Iron: a)Test soln. + potassium ferrocynide | Present |
| 02 | Test for Sodium: a)Test soln. + Potassium pyroanthllollate | Present |
| 03 | Test for Calcium: a) Test soln. + Ammonium carbonate | Absent |
| 04 | Test for Potassium: a)Test soln.+ Sodium Cobalt Nitrate | Absent |
| 05 | Test for Sulphate: a)Test soln.+ lead acetate | Absent |
| 06 | Test for Chlorides: a)Test soln.+ lead acetate | Present |
| 07 | Test for Magnesium : a)Test soln. +ammonium chloride | Absent |
| 08 | Test for Phosphate: a)Test soln. + ammonium molybdate | Present |
| 09 | Test for Carbonate: a)Ash + dil. Acid | Present |
| 10 | Test for Nitrates:<br>a)Test soln.+ ferrous sulphate + sulphuric acid | Absent |

**Table 5: Phytochemical screening of Amrabeejadi lepa churna.**

| Sl | Constituents | Tests | Aqueous | Alcohol |
|---|---|---|---|---|


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| no | | | | |
|---|---|---|---|---|
| | | Molish's test | Absent | - |
| 1 | Carbohydrate | Benedicts test | Present | Present |
| | | Barfoeds test | Present | Present |
| 2 | Test for pentose sugar | Bail's orcinol test | Absent | Absent |
| | | Selwinoffs test | Present | Present |
| 3 | Test for Hexose sugar | | | |
| | | Iodine test | Absent | Absent |
| 4 | Test for non-reducing polysaccharide | Tannic acid | Absent | Absent |
| 5 | Test for mucilage | Swelling test | Present | Absent |
| | | Millons test | Present | Present |
| 6 | Test for Proteins | Protein containing sulphur | Present | Present |
| | | Ninhydrin test | Absent | Absent |
| 7 | Test for Amino acids | Test for Tryosine | Absent | Absent |
| | | Test for cysteine | Absent | Absent |
| | | $Fecl_3$ | Present | Present |
| | | Lead acetate Solution | Present | Present |
| | | Acetic acid solution | Present | Present |
| 8 | Phenolic compounds and Tannins | Dil. Iodine solution | Present | Present |
| | | Dil. $HNO_3$ | Present | Present |
| | | Dil. potassium permanganate | Present | Present |
| 9 | Test for alkaloids | Dragendroff's test | Present | Absent |
| | | Borntrager's test | Absent | Absent |
| 10 | Anthraquinone glycoside | Modified Borntrager's test | Absent | Absent |
| 11 | Saponin Glycosides | Foam test | Absent | Absent |
| 12 | Test for coumarin glycoside | Coumarin test | Present | Present |
| 13 | Test for steroids | Salkowiski test | Present | Present |

**Microbial analysis** [7]

Microbial analysis was carried out as per procedure of Indian pharmacopoeia 2011. It included the test of presence of pathogens like *Escherichia coli, Salmonella ebony, Pseudomonas aeruginosa,* and *Staphylococcus aureus.* Results showed below in table.

**Table 6: Amrabeejadi lepa churna Microbial limit test**


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| Sl. no | Organism | Limits as per IP | Results |
|---|---|---|---|
| 1 | *Escherichia coli* | Absent | Absent |
| 2 | *Staphylococcus aureus* | Absent | Absent |
| 3 | *Pseudomonas aeruginosa,* | Absent | Absent |
| 4 | *Salmonella ebony* | Absent | Absent |

**Discussion**

Amrabeejadi lepa churna is evaluated .The analysis parameters revealed that churna is yellow brown in color, bitter in taste and soft in touch, with charteristics odor of haritaki.(Table 1)

Physicochemical parameter of amrabeejadi lepa churna is Tabulated (Table 2). Deterioration of churna depends upon the amount of water present in raw material. If water content is high, drug can easily deteriorate due to fungus. The loss on drying at $105^0$ C in Amrabeejadi lepa churna is found to be 12.8%w/w. Total ash value indicate the amount of minerals and earthy material present in raw material. Analytical results show that the ash value of Amrabeejadi lepa churna is 2% w/w. The acid insoluble ash present in plant material is 1% w/w. The water soluble ash present in plant material is 0.03%w/w. Extractive values indicate the amount of chemical constituents of the drug. Water soluble extractive indicates its soluble material. Alcohol soluble extractive values indicate the presence of polar constituents. The physical characteristics (Table 3) show that the flow properties of the powder can be judged from angle of repose. The powder has its angle of repose value of $47^0$. Higher value of this angle is attributed to the stickiness property of Amra beeja churna. The bulk density value obtained lie within the acceptable range. BD = 0.51gm/$cm^3$. Tapped density helps in calculating the percentage of compressibility of powder. TD = 0.59 gm/$cm^3$. Compressibility index is the % of compressibility of powder blend and is determined by carrs index. As the value % is found to be 13.56%, it indicates good flowability. Haustner's ratio value should be less than 1.25; this value in Amrabeejadi lepa churna is 1.16, which indicates the good flow ability**.**

The results obtained from phytochemical screening reveals that the constituents like carbohydrates, Reducing sugar, mucilage, Amino acids, Steroids, tannins Alkaloids etc. are present.(Table -5) Tannins bind to proline rich protein and interfere with protein synthesis. Flavonoids are hydroxylated phenolic substances known to be synthesized by plants in response to microbial infection and they have been found to be antimicrobial substances against wide array of microorganisms. Steroids have been reported to have antibacterial properties. Alkaloids have been associated with medicinal uses for centuries and one of their common biological properties is their cytotoxicity. Phenolic and flavonoids compounds act as natural antioxidant. It is found that the Amrabeejadi lepa churna extracts inhibited growth of all bacteria confirming their antibacterial activity. Inorganic constituents of Amrabeejadi lepa churna are determined and presented. (Table-4) It showed presence of Sodium, Iron, Sulphate, Chloride, Carbonate and Nitrates. While Magnesium and Calcium are absent in it. Prepared Amrabeejadi lepa churna is devoid of all micro-organisms. (Table-6)

**Conclusion**:

The good quality of this Polyherbal formulation has become possible by considering various scientific parameters concerning the Quality protocol. Organoleptic character and different densities of Amrabeejadi lepa churna are present in Standard range. Phyto-chemical analysis revealed the presence of tannins, alkaloids, carbohydrates and inorganic element like sodium, chloride etc. which indicates the presence of medicinally important constituents in the formulation. The formulation is free from any microbial load. Hence these values can be considered as the standard parameters of Amra beejadi Lepa churna.


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**References:**


1. Srivastava S. Sharangadhar Samhita, Jivanpradahindi commentary. Madhyamakhd, 4th ed. Varanasi: Chaukhambha Orientalia; 2005. p. 23.verse 158-61.

2. Sharangadhara samhita-Translated by srikantamurthy .1st ed., Varanasi: Chaukambha Sanskrit sansthapan, 1984.Churna kalpana 6/15.p 86

3. Pharmacopeial standards for Ayurvedic Formulations Central Council for Research for Ayurveda and Siddha. Revised Ed., Ministry of Health and Family Welfare, Government of India, New Delhi, 1987,P 1-20.

4. Lachman L, Lieberman H A, Kanig J L. The Theory and Practice of Industrial Pharmacy, 3rd eds. (Varghese Publishing house, Bombay-14, 1987) pp.183, 316

5. Aulton M E. Pharmaceutics, The science of dosage forms designs, 2nd eds. (Churchill Livingstone, New Delhi, 2002) pp. 205-221(Varghese publication house Bombay.1982.

6. Khandelwala K.R .Practical Pharmacognostic Techniques and Experiments.19th ed., Pune: Nirali publications.2008;,p 141-152.

7. Ayurveda Pharmacopeia of India. Part I, Vol. III. 1st ed., New Delhi: Government of India Ministry of Health and Family Welfare. Department of AYUSH; 2011. p. 208-13.



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