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EVALUATION OF QUALITY PARAMETERS OF SYMPLOCUS RACEMOSA (LODHRA) - AN ANALYTICAL STUDY

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ABSTRACT

Ayurveda makes extensive use of an herbal medication called *Lodhra*. Its effects are broad-spectrum across a range of illnesses. The *churna* version of *Lodhra* is the one that is used most frequently. It must be evaluated promptly in order to preserve its purity and quality. It is necessary to compare the phytochemical parameters with the accepted norms. Thus, *Lodhra churna's* quality analysis and validation were carried out in this study and compared with the medicine in its raw form. The study was carried out in the Central Research Facility of KAHER's Shri BMK Ayurveda Mahavidyalaya, Shahapur, Belagavi. The analytical parameters that were assessed are organoleptic, physicochemical, phytochemical and microbial which were found to be under normal limits when compared to the raw drug as per the API standards. This ensures the quality and purity of the *Lodhra churna*.

Keywords: Quality analysis, phytochemicals, *Lodhra churna*, phytopharmacological action

INTRODUCTION -

Symplocos racemosa termed as *Lodhra* in Sanskrit belonging to Symplocaceae family is a small evergreen tree found throughout the tropical & sub-tropical countries **[1]**. Its

properties include *kashaya rasa, laghu-ruksha guna, sheeta virya, katu vipaka* and is *kapha-pittashamak*. The phytopharmacological action of *Lodhra* include anti-cancer, hepatoprotective, anti-oxidant, anti-androgenic, anti-inflammatory, wound healing activity and anti-diabetic effects **[2]**. From ancient times, *Lodhra* is being used in various forms such as *churna, asava, kashaya*, *lepa*, etc. To maintain the quality of *Lodhra* in all these forms and to provide best quality product, it is necessary for the timely assessment of its quality control parameters and its validation based on the standard norms. Here, in this study, the quality analysis and validation of *Lodhra* in the form of *churna* was done in the Central Research Facility of KAHER's Shri BMK Ayurveda Mahavidyalaya, Shahapur, Belagavi.

MATERIALS & METHODS -

The bark of the plant was collected from the local areas in and around Belagavi district, Karnataka. The bark was identified and authenticated in the Central Research Facility of KAHER's Shri BMK Ayurveda Mahavidyalaya, Shahapur, Belagavi. The collected bark was dried and then subjected for authentification and analysis. It was then reduced to a fine powder of 220 mesh size in a mechanical grinder. The obtained *churna* was analysed and then subjected for the analysis of its different analytical properties. The analytical parameters that were assessed are organoleptic, physicochemical, phytochemical and microbial which were as per the API standards.

RESULTS FOR RAW DRUG -

Macroscopic description: (Table 1)

The raw drug *Lodhra* was taken in the form of stem bark which had greyish brown to grey colour on the external aspect and pale to whitish brown colour on internal aspect. Its taste was astringent and feebly bitter. These macroscopic characters of stem bark are as per the standards mentioned in the API **(Table 1)**.

Table 1: Macroscopic description

Tests	Results
Part	Stem bark
Colour	Greyish brown to grey externally Pale to whitish brown internally
Taste	Astringent & feebly bitter

Table 2: Physicochemical standards

Tests	Results	Reference values
Foreign matter	Nil	Nil
Ash value	9.303 %	Not more than 12%
Acid insoluble ash	0.348 %	Not more than 1%
Water soluble extractive	19.672 %	Not less than 15%
Alcohol soluble extractive	11.485 %	Not less than 9%

RESULTS FOR *CHURNA* -

Macroscopic description: (Table 3)

The finished product of *Lodhra* was in the form of *churna* which was brownish in colour and astringent and feebly bitter in taste **(Table 3)**.

Macroscopic description: (Table 3)

Tests	Results
Ash value	9.385 %
Acid insoluble ash	1.769 %
Water soluble extractive	25.034 %
Alcohol soluble extractive	17.204 %
pH value (5% solution)	4.29

Table 4: Physicochemical standards

Tests	Results
Form	*Churna*
Colour	Brownish
Taste	Astringent & feebly bitter

Table 5: Preliminary phytochemical screening

Phytochemical constituents	Water extract	Alcohol extract
Carbohydrates	+	+
Reducing sugar	+	+
Monosaccharides	+	-
Pentose sugar	-	-
Non- Reducing sugar	-	-
Hexose sugar	-	-
Proteins	+	+
Amino acids	-	+
Steroids	-	-
Flavonoids	+	+
Alkaloids	-	-
Tannins	+	+
Glycosides		
Cardiac glycosides	+	+
Anthraquinone glycosides	-	+
Saponin glycosides	-	-

Table 6: Inorganic element analysis

Calcium	Negative
Magnesium	Negative
Sodium	Negative
Potassium	Negative
Iron	Negative
Sulphate	Negative
Phosphate	Negative
Chloride	Negative
Carbonate	Negative
Nitrates	Negative

TLC: (Alcohol extract)	Rf Values
Mobile phase - Toluene:Ethyl acetate	Short wave - 0.32, 0.84, 0.89
Ratio: 7:3	Long wave - 0.15, 0.21, 0.78, 0.83, 0.90

DISCUSSION -

Lodhra is one of the important herbal medicines mentioned in Ayurveda. Here, the analysis of the raw drug, i.e., the stem bark of *Lodhra* has been done which is found to be under normal limits as per mentioned in the standard book of API. The analytical parameters of the finished product of *Lodhra* i.e., *churna* has not been mentioned in the standard book of API. So, here, an attempt has been done to analyse the organoleptic, physicochemical, phytochemical and microbial parameters of the churna and compared with the values of the raw drug. The properties possessed by *Lodhra churna* according to Ayurveda were *kashaya rasa, laghu-ruksha guna, sheeta virya, katu vipaka* and is *kapha-pittashamak*. The ash value found in the *churna* was not more than 12% just like the stem bark. The acid insoluble ash value was slightly more than 1%, which is said to be not more than 1% for raw drug. This was done to ensure the quality and purity of the *churna*. The water-soluble extract was not less than 15% and alcohol soluble extract was not less than 9% just like the stem bark. Higher water-soluble extractive value implies that water is a better solvent of extraction for the formulation than ethanol **[3]**. The pH value found in the *churna* was 4.29% which indicates its acidic nature. The presence of carbohydrates in the water extracts of *Lodhra churna* suggests its anti-cancerous activity **[4]**. Proteins in the *churna* exhibit anti-microbial, anti-oxidant, anti-cancerous and neuro-modulatory activities **[5]**. The presence of flavonoids and tannins suggests the presence of antioxidants. Antioxidants protect cells against oxidative damage and thereby prevent the occurrence of chronic diseases such as diabetes, cancer, etc. **[6]**. Tannins have been proved as anti-inflammatory, antimicrobial, antidiabetic, antitumor nutraceutical agents **[7]**. The biological activities of flavonoids have been demonstrated as antioxidants, anticancer, antibacterial, cardioprotective agents, anti-inflammatory, immune system promoting, skin protection from UV radiation. Flavonoids have also been reported as antibacterial agent against *P. acnes* which are the major cause for skin acne problems **[8]**. *Lodhra churna* also showed the presence of cardiac glycosides which possess antitumor, anti-inflammatory, anticancer, antiviral, antiaging, immunomodulatory and antioxidant effects **[9]**. The TLC profile of *Lodhra churna* is not available in the standard texts. So, here an attempt to assess its TLC profile in alcohol extract in its mobile phase has been made and the Rf value has been calculated. The Rf value in Toluene:Ethyl acetate at 7:3 ratio was found to be 0.32, 0.84, 0.89 for short wave and 0.15, 0.21, 0.78, 0.83, 0.90 for long wave. The TLC profile of alcoholic extract provides a suitable method for

monitoring the identity, purity and also standardization of the drug **[10]**. By reviewing the phytochemicals of *Lodhra* in this study, it shows its phytopharmacological actions like anti-cancer, hepatoprotective, anti-oxidant, anti-androgenic, anti-inflammatory, wound healing activity and anti-diabetic effects. This suggests its broad spectrum use in the medical field and as explained in the classics its therapeutic use can be explained.

CONCLUSION -

Thus, the quality control parameters and validation of *Lodhra churna* is found to be in its standard norms when it is compared to the parameters of the stem bark. This ensures the quality and purity of the *churna*.

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REFERENCES -

[1] Acharya N, Acharya S, Shah U, Shah R, Hingorani L. A comprehensive analysis on Symplocos racemosa Roxb.: Traditional uses, botany, phytochemistry and pharmacological activities. J Ethnopharmacol. 2016 Apr 2;181:236-51. doi: 10.1016/j.jep.2016.01.043. Epub 2016 Feb 3. PMID: 26851499.

[2] Acharya N, Acharya S, Shah U, Shah R, Hingorani L. A comprehensive analysis on Symplocos racemosa Roxb.: Traditional uses, botany, phytochemistry and pharmacological activities. J Ethnopharmacol. 2016 Apr 2;181:236-51. doi: 10.1016/j.jep.2016.01.043. Epub 2016 Feb 3. PMID: 26851499.

[3] Ajazuddin, Saraf S. Evaluation of physicochemical and phytochemical properties of Safoof-E-Sana, a Unani polyherbal formulation. Pharmacognosy Res. 2010 Sep;2(5):318-22. doi: 10.4103/0974-8490.72332. PMID: 21589760; PMCID: PMC3093045.

[4] Wang J, Zhang Y, Lu Q, Xing D and Zhang R (2021) Exploring Carbohydrates for Therapeutics: A Review on Future Directions. Front. Pharmacol. 12:756724. doi: 10.3389/fphar.2021.756724

[5] Wani SS, Dar PA, Zargar SM, Dar TA. Therapeutic Potential of Medicinal Plant Proteins: Present Status and Future Perspectives. Curr Protein Pept Sci. 2020;21(5):443-487. doi: 10.2174/1389203720666191119095624. PMID: 31746291.

[6] Khatri D, Chhetri SBB. Reducing Sugar, Total Phenolic Content, and Antioxidant Potential of Nepalese Plants. Biomed Res Int. 2020 Nov 15;2020:7296859. doi: 10.1155/2020/7296859. PMID: 33274222; PMCID: PMC7683130.

[7] https://doi.org/10.1016/B978-0-443-19193-0.00002-2

[8] Tungmunnithum D, Thongboonyou A, Pholboon A, Yangsabai A. Flavonoids and Other Phenolic Compounds from Medicinal Plants for Pharmaceutical and Medical Aspects: An Overview. Medicines (Basel). 2018 Aug 25;5(3):93. doi: 10.3390/medicines5030093. PMID: 30149600; PMCID: PMC6165118.

[9] https://doi.org/10.1016/B978-0-323-85852-6.00021-4

[10] Govindarajan, Nartunai & Maheswara, Uma & Cheekala, Reddy & Arcot, Shantha & Sundaramoorthy, Susikumar & Shanmugam, Murugammal & Duraisamy, Ramasamy & Narasimhaji, Venkata & Raju, Ilavarasan. (2019). Comparative Powder Microscopic and HPTLC Studies on Stem barks of Symplocos racemosa Roxb. and Symplocos crataegoides Ham.