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Pharmacognostical and Pharmaceutical evaluation of *Bilwadi taila: An Ayurvedic oil based medicine*

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ABSTRACT

Background: *Bilwadi Taila* is a *Sneha Kalpana*, indicated in *Karna Roga* specially in *Badhira Roga*. In present study, it has been used for *Karnapurana* in *Badhira Roga*. **Objective:** Present study is aimed to look out on *Apakva Bilwa phala majja* (Raw drug) used in the preparation of *Bilwadi Taila* and standardization of Pharmacognostical, Physicochemical parameters and HPTLC evaluation. **Methods:** Raw Drug identification and authentication was done by pharmacognostical study i.e. Morphological features, organoleptic characters and powder microscopy. Physicochemical evaluation and HPTLC was carried out of final product. **Results:** Pharmacognostical Study of *Apakva Bilwa phala majja* (Raw Drug) showed presence of Scleroids, Spoon cells, Tannin containing cells, Cluster crystal, Rosette crystal, Oil globules, Lignified fibres etc. Pharmaceutical evaluation showed results specific gravity 0.9376, Refractive Index 1.4870, Acid Value 5.37, Saponification Value 210.77, Iodine Value 11. High Performance Thin Layer Chromatography at 254nm and 366 nm results in to 8,4 and 6 spots before and after spray respectively. **Conclusion:** Identification, Authentication of Herbal drug used in the preparation and Raw Drug has been done. Physicochemical evaluation has been carried out of *Bilwadi Taila*, which is further useful for standardization and another researches.

Keywords: *Bilwadi Taila*, Pharmaceutical, Badhira, Pharmacognosy, Karnapurana, Standardization.

INTRODUCTION

Bilwadi Taila is one of the medicated formulation prescribed in Ayurvedic text *Sushruta Uttara Tantra* in *KarnaChikitsa* [1]. It is Ayurvedic herbal oil which is used as remedy for various ear problems such as pain in ear, constant ringing, buzzing or whistling in ear, loss of hearing etc. It is prepared using Bael or bilwa (*Aegle marmelos*). This oil has antimicrobial, antiseptic and astringent properties. This preparation contains Single herbal drug. *Gomutra*, *Aja Ksheera*, *jala* are used as *Drava Dravya* and *TilaTaila* as *Snehadravya*. It is specially indicated as in *BadhiraRoga*. Present study is focus on first attempt to develops quality parameters of *Bilwadi Taila* on the basis of pharmacognostical, physicochemical parameters and chromatographic evaluation. Hence, there is need to scientific proof for standardization of quality parameters. Thus, for the present study the formulation were prepared and analyzed to develop the standards for the formulation through physico-chemical analysis, pharmacognostic parameters and chromatographic profiling of prepared drug.

Objective of Study

Present study, is aimed to look out on *Apakva Bilwa phala majja* (Raw drug) used in the preparation of *Bilwadi Taila* and Standardization of Pharmacognostical, Physicochemical parameters and HPTLC evaluation. The purpose of Standardization of *Apakva Bilwa phala majja* (Raw drug) and final product is to ensure therapeutic efficacy.

MATERIALS & METHODS

Collection, identification, authentication of raw drugs

Bilwa (*Aegle Marmelos*.Corr) was procured from the pharmacy of Gujarat Ayurveda University, Jamnagar. *Aja Ksheera* was collected from Local area of jamnagar (Gujarat). The ingredients of *Bilwadi Taila* and its part used are given at Table No 1. The *Apakva Bilwa phala majja* (Raw drug) was identified and authenticated by Pharmacognosy Laboratory, IPGT & RA, Gujarat Ayurved University, Jamnagar. Identification was done on basis of organoleptic characters [Table No 2,3], morphological features and microscopy of Raw drug as per API standards for authentication. *Bilwadi Taila* was stored in well filled closed glass containers away from the light.



Figure 1: Bilwa fruit



Figure 2: Bilwa fruit pulp

Table 2: Formulation composition Bilwadi Taila

No.	Ingredients	Latin / English name	Part used	Proportion
1.	Bilwa Phala Majja (apakava)	Aegle Marmelos.Corr	Phala Majja	1 part
Drava dravya				
2.	Aja Ksheera	-	Dugdha	16 part
3.	Jala	-	-	16 part
4.	Gaumutra	Cow's urine	-	16 part
Sneha Dravya				
5.	Tila Taila	Sesamum Indicum.Linn	Taila	4 part

Preparation of Bilwadi Taila in Bhaishajya Kalpana Laboratory of IPGT & RA, Jamnagar

Bilwa Phala Majja (Apakva) was collected from Bilwa fruit. Seeds were removed from Bilwa phala majja. Properly made bolus of Bilwa phala majja (Kalka) kept in stainless steel vessel for further process. Tila Taila in the mentioned quantity was taken in a stainless steel vessel and heated over mild flame (80°C for 5 min) till complete evaporation of moisture and then bolus of Raw drug were added in it. After mixing of Raw drug, the specified quantity of Gomutra, Aja ksheera, Jala were added and the mixture was subjected to heat. Heating was continued maintaining the temperature in between 95-100°C with continuous stirring. Contents were stirred continuously to avoid the possibility of settling down. Heating was continued for one day till Sneha Siddhi Lakshana were obtained. After obtaining desired Sneha Siddhi Lakshana, the vessel was taken out from heat and oil was filtered through two folded cotton cloth in its hot stage. The prepared oil was stored in a properly label air tight bottle after cooling.

Pharmacognostical Study

Apakva Bilwa phala majja (Raw drug) was identified and authenticated by pharmacognosy department, IPGT & RA, Gujarat Ayurved University, Jamnagar. The identification was carried out on the basis of organoleptic features, morphological features [2, 3].

Pharmaceutical Evaluation

Physicochemical Parameters

Bilwadi Taila was analyzed by using qualitative and quantitative parameters at Pharmaceutical Laboratory, IPGT & RA, Gujarat

Ayurved University, Jamnagar. The common parameters mentioned in Ayurvedic Pharmacopeia of India [4] and CCRAS guidelines [5] i.e. Refractive index [6], Specific gravity [7], Acid value [8], Iodine value [9], Saponification value [10] were taken.

High Performance Thin Layer Chromatography (HPTLC):

Sample preparation

0.1ml of oil was taken and 1 ml of hexane was added. The solution was prepared used for chromatography. Thereafter pre chromatographic derivatization was done. Alcoholic KOH (base) and thereby heated for 10-15 minutes in CAMAG TLC plate heater. Sample application was done using CAMAG linomat 5.

HPTLC of Bilwadi Taila was carried out using the solvent system petroleum Ether: Diethyl ether: Acetic Acid (9:1:0.1v/v). HPTLC study was performed for the normal phase separation of components of product. Post chromatographic derivatization was done with vanillin sulphuric acid spray reagents [11].

OBSERVATIONS AND RESULTS

Organoleptic characters

Organoleptic characters like Taste, Colour, Odour, Touch and Texture were scientifically studied as per detailed in Table 3,4.

Table 3: Organoleptic characters of raw herbal materials used in formulation

Sr. No.	Ingredient	Colour	Taste	Odour	Touch
1	<i>Bilwa Phala Majja</i> (Apakva)	Yellowish	Sweet	Strong aromatic	Slight rough
2	<i>Tila Taila</i>	Dark red	Astringent	Aromatic	Rough
3	<i>Aja Ksheera</i>	White	Sweetish	Aromatic	Slight rough
4	<i>Gaumutra</i>	Yellowish	Pungent, Bitter	Characteristic	Rough

Table 4: Organoleptic characters of prepared Drug (*Bilwadi Taila*)

S. No.	Various parameters	Results
1	Colour	Light yellow
2	Odor	Mild Smell of <i>TilaTaila</i>
3	Taste	<i>Tikta kashaya Rasa</i>
4	Touch	Oily
5	Texture	Liquid

Specific gravity, Acid value, Iodine value, Saponification value were scientifically studied and results were detailed in Table no- 4.

Table 4: Physicochemical Parameters of *Bilwadi Taila*.

S. No.	Analytical Parameters	Result of <i>Bilwadi Taila</i>
1	Refractive Index	0.9376
2	Specific gravity @ 25° C (g/ml)	1.48
3	Acid Value	5.37
4	Iodine Value	11
5	Saponification Value	210.77

Microscopy of *Bilwa Apakva phala majja* (Raw drug)

Bilwa Apakva phala majja (Raw drug) was studying under the Carl Zeiss Trinocular Microscope before and after staining with Phluroglucinol and concentrated HCL to study the characters of drug. The microphotographs were taken by a camera attached with the microscope as given below.

Microscopic Characters of *Bilwa Apakva phala majja* (Raw drug)

The diagnostic characters under microscope showed Fibers with Prismatic Crystals, Pitted and spiral vessels, Paranchyma cells embedded with starch grains, Presence of cluster crystal, Lignified Fibers of *Bilwa phala majja*. [Figure 1, 2, 3, 4].

Pharmaceutical Analysis

Physicochemical Analysis of *Bilwadi Taila* i.e. Refractive index,

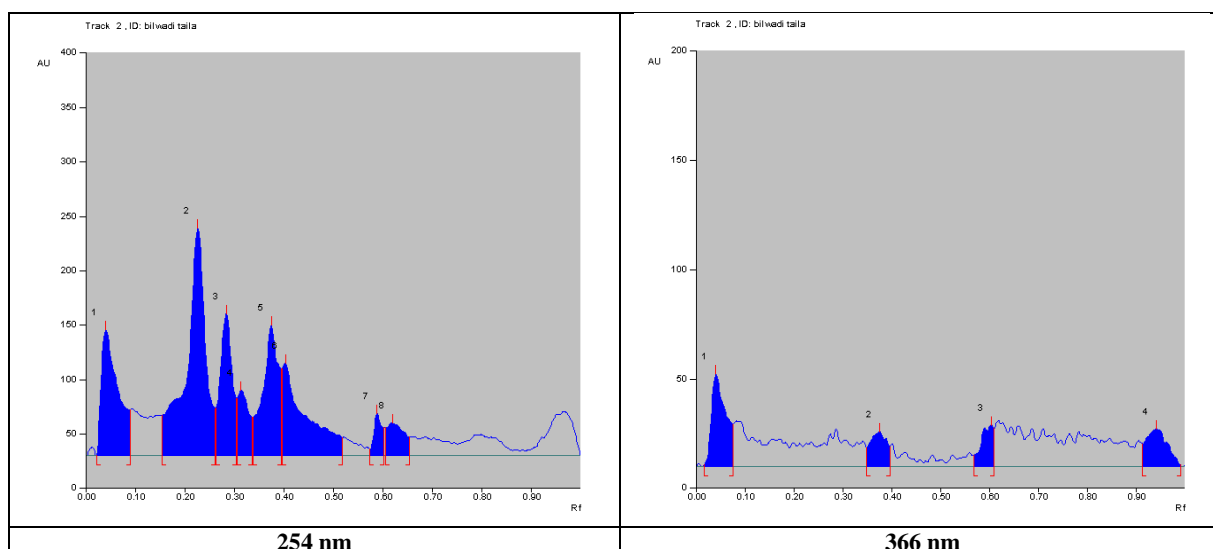
HPTLC Study

Chromatographic study (HPTLC) was carried out under 254nm and 366nm to establish fingerprinting profile. It showed spots at 254 nm, spots at 366 nm before spray.

Table 6: Results of *Bilwadi Taila*.

Before spray	Wavelengths	No of Spots	Rf value
Before spray	254 nm	11	
	366 nm	4	

DENSITOGRAM OF *BILWADI TAILA* (Before Spray)



DISCUSSION

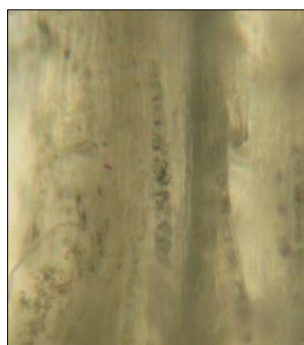
Normally oils give different characteristics like colour and odor relative to ingredients which were used to prepare the medicated oil. This medicated oil had, light yellowish colour due to *Apakva Bilwa Phala Majja* and *Tila taila*. The characteristic odor is due to *Gomutra*, *Tila Taila* which were used in preparation. Authentication of used drugs was done by morphological and histological. This can prevent misuses of drug adulteration. The pharmacognostical evaluation shows that the *Bilwa Apakva phala majja (Raw drug)* contains all standard microscopical characters. This shows the purity and quality of product.

According to analytical study, Saponification value of *Bilwadi Taila* was 210.77 mg/g. It is more than normal saponification value of *Tila taila* (169.5)^[12]. Its due to heating process with intermediate drugs. It is the measure of average molecular weight of all fatty acids present in it. The short chain fatty acids found in fats have more saponification value. Relatively, more numbers of carboxylic functional group per unit mass of the fat. Acid values are used to measure the extent to which glycerides in the oil has been decompose by lipase and other physical factors like heat and light. Minor changes was observe in acid value suggests that medicated *taila* is very saturated. The iodine value is a measure of the degree of unsaturation in oil and could be used to quantify the amount of double bonds present in oil which reflects the susceptibility of oil to oxidation. Refractive index is an important parameter to assess quality of oil as it is change according to its compounds. Specific gravity is varying according to density of liquid. So, it suggests that the more heating gives more Saponification value, Acid value and Specific gravity. TLC finger print profile consists of 8,4 prominent spots under UV light at 254nm and 366nm. HPTLC fingerprint profile helps in identification of various phytochemical constituent present in the crude drug thereby substantiating and authenticating of product. These findings could be helpful in identification and authentication.

CONCLUSION

Present study reveals that quality of *Bilwadi Taila* as per pharmacognostical and physico chemical parameters, which helps in justifying the quality of formulation and meet the desired quality. First time, this profile of *Bilwadi Taila* was established. On the basis of observations and experimental result, the evaluation of research of *Bilwadi Taila* may be used as standard reference for further quality control research works and clinical studies.

MICROPHOTOGRAPHS OF *BILWADI TAILA* (PLATE-1)



1. Fibers with Prismatic Crystals



2. Pitted and spiral vessels



3. Paranchyma cells embedded with starch grains



4. Lignified Fibers

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