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A Pharmacognostical and Pharmaceutical evaluation of *Dhanyamla*

Research Article

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Abstract

Introduction: *Dhanyamla* is a medicated liquid preparation produced by fermentation process of various grains. *Dhanyamla* is cold at perception by its nature as it is a sour liquid and Ayurvedic classics opine that amla rasa is of cold nature if used externally. It is commonly used for management of Diabetic Polyneuropathy which commonly presents with burning sensation, loss of strength, loss of balance, loss of sensation, numbness etc. especially of feet. Materials and methods: Raw drugs of *Dhanyamla* as per the reference in Sahasrayogam were purchased from the local market of Jamnagar, Gujarat. It was prepared as per the standard preparation procedure at Department of Rasa shastra and Bhaishajya kalpana, IPGT&RA, GAU, Jamnagar. The final product was then subjected to pharmacognostical and pharmaceutical analysis. Pharmacognosy of *Dhanyamla* was carried out by preparing a slide made with glass slide and cover slip. Then this slide was observed under the Carl Zeiss Trinocular microscope. Organoleptic characters and physico-chemical parameters were noted. HPTLC was performed and observed under short UV (254 nm) and long UV (366 nm). Results: Pharmacognosy study of *Dhanyamla* revealed presence of starch content and oil globules. Analytical study of *Dhanyamla* showed 14 spots and 20 spots at 254 nm and 366 nm respectively. Specific Gravity, pH and total solid contents were 1.0033, 3.257 and 55.334 respectively. Discussion and conclusion: The presence of both carbohydrate and oil content would have been the reason of having soothing and mild nourishing effect.

Key Words: *Dhanyamla, Pharmacognosy, Pharmaceutics.*

Introduction

Dhanyamla is a medicated liquid preparation produced by fermentation process of various grains. Sometimes it also consists of certain medicines to have additive effect on some medical conditions. *Dhanyamla* gets its properties on the basis of, first its ingredients and secondly because of the fermentation process. Major part of it consists of various kinds of grains due to which it becomes nutritional.

Dhanyamla is cold at perception by its nature as it is a sour liquid and Ayurvedic classics opine that amla rasa is of cold nature if used externally but is of hot nature if used internally.(1) Thus if *Dhanyamla* is used externally for *Pariseka* etc. it reduces *Pitta*. Clinically this property is used in various *Pitta janya* diseases like burning sensation in various parts of body, etc. if used internally it is said to be *laghu, bhedina, teekshna, ushna,* pacifies *Vata* and *Kapha*, *trishna hara*.(2) It improves taste and appetite, reduces fatigue and lassitude. Due to such properties it used both internally and externally for purpose of *pana, kavala, gandusha, basti, dhara, avagaha* etc.

Dhanyamla is commonly used for management of Diabetic Polyneuropathy which commonly presents with burning sensation, loss of strength, loss of balance, loss of sensation, numbness etc. especially of feet. This condition is mainly *Vata-Pitta pradhana* and *Kapha* in the background which is mainly responsible for *Prameha/Madhumeha*. Keeping this in mind local *Dhanyamla* dhara/*pariseka* is used to mitigate the above symptoms of diabetic polyneuropathy. Now to understand the mechanism of *Dhanyamla* as how does it successfully mitigate neuropathy an attempt has been made to get some clue in understanding the liquid as a whole in terms of its microscopic analysis and physico-chemical analysis. Addition to this pharmacognosy of *Dhanyamla* was done to authenticate the ingredients used.

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Materials and Methods

Collection of raw drugs

Raw materials required for preparation of *Dhanyamla* were purchased from the local market of Jamnagar, Gujarat. The ingredients and parts used in the preparation of the final products are listed in Table No. (1). After collection and proper cleaning of all the ingredients, *Dhanyamla* was prepared at Department of Rasa shastra and Bhaishajya kalpana, IPGT&RA, GAU, Jamnagar.

Table 1 - Contents of *Dhanyamla* (3)

Sr. No.	Ingredients	Parts used	Quantity
1	*Tandula* (*Oryza sativa L.*)	Dehusked rice grains	*10 Prastha (7680 gms)*
2	*Pruthuka* (Pressed form of *Oryza sativa L.*)	Pressed Rice	*10 Prastha (7680 gms)*
3	*Kulattha* (*Dolichus biflorus Linn.*)	Seeds	*40 Pala (1920 gms)*
4	*Laja* (Puffed form of *Oryza sativa L.*)	Puffed Rice	*40 Pala (1920 gms)*
5	*Kangubeeja* (*Panicum sumatrense* Roth ex Roem. & Schult.)	Seeds	*1 Adhaka (3072 gms)*
6	*Kodrava* (*Paspalum scrobiculatum* L.)	Seeds	*4 Prastha (3072 gms)*
7	*Nagara* (*Zingiber officinale* Roscoe.)	Rhizome - fresh	*2 Prastha (1536 gms)*
8	*Nimbuka* (*Citrus medica* L.)	Fruit - whole	*2 Adhaka (6144 gms)*
9	*Deepyaka* (*Trachyspermum ammi* (L.) Sprague ex Turrill)	Seeds	*8 Kudava (1536 gms)*
10	Water	--	*200 Prastha (153.6 lit.)*

Preparation of *Dhanyamla*

First of the prescribed quantity of water was taken in a big steel vessel and was kept over a stove for heating. Then all the ingredients were added to the water filled vessel. The water was heated until it was luke warm and not boiled. Then luke warm water with all the ingredients in whole form were poured into a big clean porcelain vessel inside of which was pre fumigated. Then the vessel was closed properly and sealed. The liquid was now allowed to undergo fermentation process. Dhanyamla was checked for fermentation by means of match stick test and production of proper gandha (odour). Fermentation was completed in 15 days. After completion of the fermentation process the liquid was filtered and transferred into a clean vessel for storage.

Pharmacognostical study

Dhanyamla was observed and authenticated by the Pharmacognosy department of the institute. The identification of individual drugs was done on the basis of microscopic features of the finished product. Here, pharmacognostical evaluation of *Dhanyamla* was carried out by preparing a slide made with glass and cover slide. Then this slide was observed under the Carl Zeiss Trinocular microscope. The microscope was attached with a camera. Then photographs of *Dhanyamla* slide (finished product) at 40x magnification were taken without staining and after that with-staining (phloroglucinol and HCl staining).

Organoleptic Study

Dhanyamla liquid was observed for the organoleptic characters like color, odor and taste at the pharmacognosy laboratory of the institute.

Pharmaceutical Evaluation

Dhanyamla was subjected to testing of certain important Physico-chemical parameters (4)(as per API) at the institutional pharmaceutical laboratory; like specific gravity, pH and total solid contents to understand characteristics of this medicated liquid. These may be helpful in understanding its mode of action especially on its application externally as a mode of *Pariseka sweda* in cases of diabetic polyneuropathies, etc.

High Performance Thin Layer Chromatography (HPTLC) (8)(9)(10) study of *Dhanyamla* was performed by using Toluene: Ethyl acetate (9:1 v/v) solvent system and observed under short UV (254 nm) and long UV (366 nm). The instruments and methods were as under,

- Application Mode : CAMAG Linomat 5-Applicator
- Filtering System : Whatman Filter paper No.1
- Stationary Phase : MERCK HPTLC Silica Gel 60 F254
- Application (Y axis) Start Position : 10mm
- Sample Application Volume : 10µL
- Development Mode : CAMAG TLC Twin Trough Chamber
- Chamber Saturation Time : 30 Minutes
- Mobile Phase : Petroleum ether: Diethyl ether : Acetic acid
- (9:1:0.1v/v) :
- Visualisation : @254nm, @366nm and (after derivatization)
- Derivatization Mode : CAMAG - Dio tank for about 1 minute
- Drying Mode, Temperature : TLC Plate Heater preheated at 100±50°C
- Drying Time : 3 Minutes

Results

Characteristics of *Dhanyamla*: Microscopic evaluation of *Dhanyamla* was conducted and microphotographs were taken as seen, Photo - 1.1 *Dhanyamla* liquid, Photo - 1.2 Starch grains of Rice, Photo - 1.3 Stained starch grains of *Pruthuka*, Photo - 1.4 Stained starch grains of *Kulattha*, Photo-1.5 Starch grains of *Laja*, Photo - 1.6 Starch grains of *Kangu beeja*, Photo-1.7 Starch grains of *Kodrava*, Photo - 1.8. Starch grains of *Shunti*, Photo-1.9 Oil globule of Citrus, Photo - 1.10 Epidermal cells with oil globule of Ammi.

Photo 1.1 - *Dhanyamla* liquid

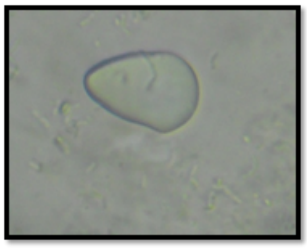


Photo 1.2 - Starch grains of Rice

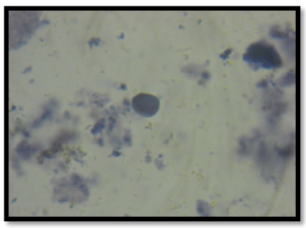


Photo 1.3 - Stained starch grains of *Pruthuka*

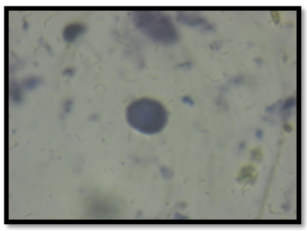


Photo 1.4 - Stained starch grains of *Kulattha*

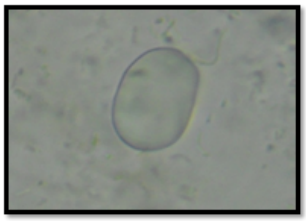


Photo 1.5 - Starch grains of *Laja*

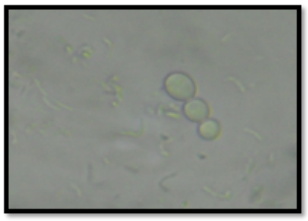


Photo 1.6 - Starch grains of *Kangu beeja*

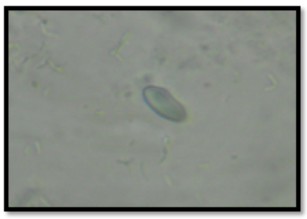


Photo 1.7 - Starch grains of *Kodrava*

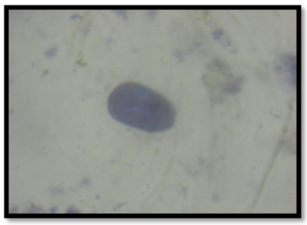


Photo 1.8 - Starch grains of *Shunti*

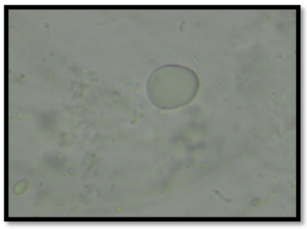


Photo 1.9 - Oil globule of Citrus

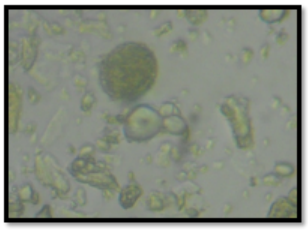


Photo 1.10 - Epidermal cells with oil globule of Ammi

Organoleptic characters of *Dhanyamla*, it was a cream colored liquid with strong sour smell and sour to taste. Details of physicochemical parameters are mentioned in Table-[2]. HPTLC profile of methanolic extract of *Dhanyamla* was done and details of number of spots and Rf value are given in Table-[3] and HPTLC profile is given in Photo 2 showing HPTLC: Densitogram at 254 nm and Photo 3 HPTLC: Densitogram at 366 nm.

Table 2 - Physico-chemical parameters of *Dhanyamla*

No.	Analytical parameter	*Dhanyamla*
1	Specific Gravity (5)	1.0033
2	pH (6)	3.257
3	Total solid content (7)	55.334

Analytical study of *Dhanyamla* has showed 14 spots and 20 spots at 254 nm and 366 nm respectively.

Table: 3 - R_F Values of *Dhanyamla*

Wavelength	No. of Spots	R_f values
Short UV (254 nm)	14	0.05, 0.11, 0.14, 0.16, 0.20, 0.35, 0.36, 0.39, 0.44, 0.47, 0.50, 0.72, 0.89, 0.98
Long UV 366 nm	11	0.04, 0.11, 0.13, 0.20, 0.35, 0.36, 0.40, 0.44, 0.46, 0.50, 0.84

Photo 2 - Densitogram curve of Methanol extract of *Dhanyamla* at 254nm

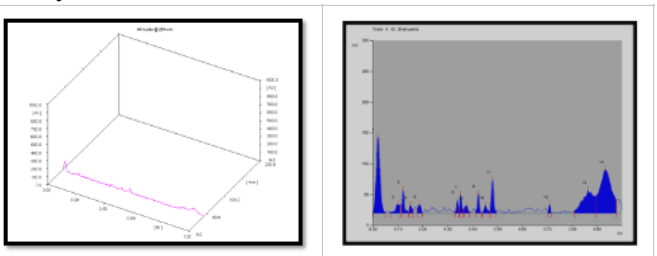
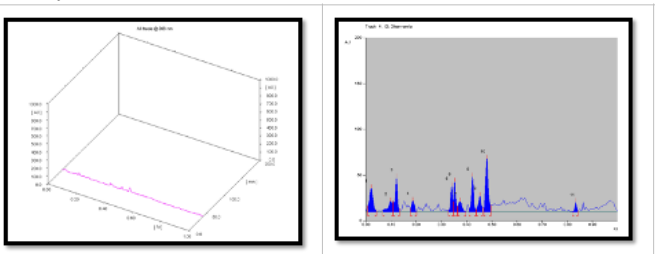


Photo 3 - Densitogram curve of Methanol extract of *Dhanyamla* at 366nm



Discussion

Pharmacognosy study of *Dhanyamla* revealed starch content in it which was due to the grain ingredients like *Tandula, Pruthuka, Kulattha, Laja, Kangubeeja, Kodrava* and *Nagara* which are rich sources of carbohydrates especially rice. It also showed presence of oil globules which was due to *Nimbuka* and *Deepyaka*. The presence of both carbohydrate and oil content in *Dhanyamla* would have been the reason of it having soothing and mild nourishing effect on using it externally. In the same time *Dhanyamla* as the name suggests and as mentioned earlier is a sour liquid i.e. *amla* or acidic due to the process of fermentation. This is clearly justified by the pH observed i.e. 3.25. Thus

because of this it has penetrating property which helps in cleansing of the blocked *srotases* also. The specific gravity of 1.0033 signifies that it is not a highly concentrated and viscous solution on physical examination. It is a watery non viscous solution as the ratio of water to other ingredients is large. It does not stick on the skin surface and flows like water itself. The HPTLC finger printing of *Dhanyamla* at 254 and 366 nm wavelengths was done to record and standardize the solution for future references. This study to a certain extent has helped in throwing light on understanding probable action of *Dhanyamla* in Diabetic polyneuropathy.

Conclusion

The Pharmacognostic study has showed presence of starch and oil globules in *Dhanyamla* signifying that the contents of the ingredients of *Dhanyamla* have been imparted to final fermented solution. Pharmaceutical study showed the acidic nature and other characteristics of the solution making it possible to understand how *Dhanyamla* might have worked on patients of Diabetic polyneuropathy. The results of this study may be used as a reference standard in further research undertakings of its kind.

References

1. Jadavji Trikamji Acharya, Narayaṇ Ram Acharya, editors. Sushruta saṃhita of Sushruta. Critical edition. Bombay: Satyabhamabai Pandurang, 1945. Sootrasthaana 45/214-216; p.204. Edited Book.
2. Shivprasad Sharma, editor. Aṣṭāṅga saṁgraha of Vṛddha Vāgbhaṭa with the Śaśilekhā Commentary. 3rd edition. Varanasi: Chaukhambha Sanskrit Series office, 2012. Sootrasthaana 6/103; p.47. Edited Book.
3. Panditrao D. B., translator; Vaidya Mahendrapal singh Arya, Editor. Sahasrayogam – Hindi translation. 1st edition, Reprint. New Delhi: Central Council for Research in Ayurvedic Sciences, 2011. Saptam Prakarana 46; p. 366. Edited book.
4. Wallis TE, Text book of Pharmacognosy, 5th Ed., New Delhi: CBS Publishers & Distributors, 2002; 123 -132, 210-215.
5. The Ayurvedic Pharmacopoeia of India, 1st edition, Govt. of India, Ministry of health and family welfare, Dept. of AYUSH, New Delhi, 2007; Part - II, Vol. I, appendix-3.2.: 190.
6. The Ayurvedic Pharmacopoeia of India, 1st edition, Govt. of India, Ministry of health and family welfare, Dept. of AYUSH, New Delhi, 2007; Part - II, Vol. I, appendix-3.3.: 191.
7. The Ayurvedic Pharmacopoeia of India, 1st edition, Govt. of India, Ministry of health and family welfare, Dept. of AYUSH, New Delhi, 2007; Part - II, Vol. I, appendix-3.8.: 199.
8. Anonymous, 1999, Planner Chromatography, Modern thin layer chromatography, Switzerland, pg 2-16.
9. Chatwal G. R., Anand S. K., Industrial method of chemical analysis, 5th revised and enlarged edition, Himalaya publishing house, 2.272-2.503, 2.599-2.616, 2.673-2.700.
10. Stahl E., Thin-layer chromatography – a laboratory handbook, 2nd edition. Springer-Verlag New york, 1969; 125-133.

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