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Pharmacognostic standardization of Jwarnashak Panch Kashya

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Abstract

Pharmacognostic standardization of polyherbal formulations is important step in order to explain the quality of formulation. The present research work reports pharmacognostic standards of polyherbal formulation Jwarnashak Panch Kashya which contains five herbal drugs (*Tinospora cordifolia*, *Swertia chirata*, *Fumaria parviflora*, *Zingiber officinale* and *Cyperus rotundus*) in equal proportion. Traditionally, Jwarnashak Panch Kashya is used as antipyretic. Various pharmacognostic standards of Jwarnashak Panch Kashya such as ash values, extractive values, moisture content, foreign organic matter, swelling index, foaming index, tannin determination and volatile oil content were generated using standardized methods. Phytochemical screening showed presence of fats, triterpenoids, alkaloids, steroids, anthraquinone glycosides, cyanogenetic glycosides, cardiac glycosides, flavonoids, saponins, coumarins, tannins, proteins and carbohydrates in plant. Thin layer chromatography fingerprint profile of *n*-hexane, chloroform and methanol extracts showed five, six and eight spots, respectively, using optimized solvent system.

Keywords: Jwarnashak Panch Kashya, physico-chemical parameters, polyherbal formulation

1. Introduction

Jwarnashak Panch Kashya has been traditionally used as antipyretic. Jwarnashak Panch Kashya contains five herbal drugs named as *Tinospora cordifolia* aerial parts (Guduci; Menispermaceae), *Swertia chirata* aerial parts (Chirata; Gentianaceae), *Fumaria parviflora* whole plant (Papra; Fumariaceae), *Zingiber officinale* rhizomes (Ginger; Zingiberaceae) and *Cyperus rotundus* rhizomes (Nagarmotha; Cyperaceae) in equal proportion^[1].

A thorough survey of literature revealed that most of pharmacognostic standards related research work has been carried out on selected plants in polyherbal formulation. But no pharmacognostic standardization related work has ever been carried out on Jwarnashak Panch Kashya. Non-availability of pharmacognostic standards for authentication of Jwarnashak Panch Kashya is one of the reasons for sporadic phytochemical and pharmacological reports on this traditionally used polyherbal formulation. Thus, the present research work was designed to generate pharmacognostic standards for Jwarnashak Panch Kashya.

2. Materials and methods

2.1 Plant materials and preparation of polyherbal formulation

The plants of Jwarnashak Panch Kashya were procured from Himalaya Herb Stores, Madhav Nagar, Saharanpur, Uttar Pradesh, India in December, 2015. The plants were identified by Dr. Avneet Pal Singh, Assistant Professor, Department of Botany, Punjabi University, Patiala, India (Reference No. SPL-111/Bot, dated 25-12-2015). Polyherbal formulation was prepared by mixing equal proportion of each powdered plant drug.

2.2 Pharmacognostic standards

Physico-chemical parameters such as ash values (total ash, acid insoluble ash, water soluble ash, sulphated ash), extractive values (petroleum ether soluble extractive, alcohol soluble extractive, water soluble extractive), moisture content, foreign organic matter, swelling index, foaming index, tannin determination, volatile oil content and fluorescence analysis were generated as per standard methods^[2-5]. Various extracts of powdered polyherbal formulation such as *n*-hexane, chloroform, methanol and water extracts were prepared as per standard procedures^[6]. Various extracts were subjected to phytochemical screening to ascertain various classes of phytoconstituents present therein^[7].

The dried *n*-hexane, chloroform and methanol extracts were dissolved in 3 ml of respective solvents, and their volume was made up to 5 ml in volumetric flasks. Ten μ l of the stock solution of each extract was loaded on TLC plates using CAMAG LINOMAT 5. The thin layer chromatograms were visualized by spraying with 0.5% anisaldehyde followed by heating at 105°C for 2 min [8]. The chemicals, solvents and reagents used in present study were procured from Central Drug House Pvt. Ltd., Mumbai; Panacea Biotech, Lalru; E-Merck Ltd., Mumbai and S.D. Fine Chemicals, Biosar.

3. Results and Discussion

Results of various pharmacognostic standards of polyherbal formulation are shown in table 1. Table 2 shows fluorescence analysis of polyherbal formulation with various reagents. The percentage yields of *n*-hexane, chloroform, methanol and water extracts of polyherbal formulation were found to be 1.81, 2.28, 9.37 and 12.58% w/w respectively. Various extracts of polyherbal formulation were dissolved in their respective solvents and screened for different classes of phytoconstituents using specific standard reagents. The results of phytochemical screening showed presence of lipids in *n*-hexane extract; alkaloids, steroids, triterpenoids in chloroform extract; triterpenoids, steroids, alkaloids, steroids, anthraquinone glycosides, cyanogenetic glycosides, cardiac glycosides, flavonoids, saponins, coumarins, tannins in

methanol extract and anthraquinone glycosides, cyanogenetic glycosides, cardiac glycosides, proteins, carbohydrates in water extract. Results of thin layer chromatography fingerprint profile of various extracts of polyherbal formulation are shown in table 3 and figure 1.

Table 1: Mean values of various physicochemical parameters of Jwarnashak Panch Kashya.

Parameters	Observations
Total ash	14.25 \pm 0.01 % w/w
Acid insoluble ash	1.01 \pm 0.01 % w/w
Water soluble ash	3.87 \pm 0.02 % w/w
Sulphated ash	6.44 \pm 0.01 % w/w
Petroleum ether soluble extractive	1.48 \pm 0.01 % w/w
Alcohol soluble extractive	8.48 \pm 0.04 % w/w
Water soluble extractive	11.47 \pm 0.03 % w/w
Moisture content	6.99 \pm 0.02 % w/w
Foreign organic matter	Nil
Swelling index	1.9 \pm 0.10
Foaming index	Less than 100 \pm 0.00
Tannin determination	3.20 \pm 0.02 % w/w
Volatile oil	0.76 \pm 0.01 % v/w

n = 3

Table 2: Fluorescence analysis of Jwarnashak Panch Kashya.

Treatment	Visible light	Ultraviolet light	
		Short wavelength (254 nm)	Long wavelength (366 nm)
Hexane	Brown	Green	Green
Chloroform	Brown	Green	Green
Methanol	Light brown	Green	Green
Ethyl acetate	Brown	Green	Green
Glacial acetic acid	Light brown	Dark green	Green
Formic acid	Brown	Dark green	Dark brown
Dilute ammonia	Light brown	Dark green	Dark green
Dilute Hydrochloric acid	Brown	Dark green	Green
Dilute sulphuric acid	Dark brown	Blackish brown	Violet
Dilute nitric acid	Brown	Dark green	Dark green
5% Ferric chloride	Reddish black	Blackish brown	Violet

Table 3: Results of thin layer chromatography of various extracts of Jwarnashak Panch Kashya.

Extract	Mobile phase	Number of spots*
<i>n</i> -Hexane	Hexane : Chloroform (1 : 1)	Five spots R _f values – 0.26, 0.67, 0.78, 0.87 and 0.97
Chloroform	Chloroform : Methanol : Formic acid (8:1:1)	Six spots R _f values – 0.25, 0.46, 0.62, 0.79, 0.88 and 0.95
Methanol	Toluene : Ethyl acetate : Methanol (6:3:1)	Eight spots R _f values – 0.20, 0.49, 0.59, 0.67, 0.73, 0.78, 0.84 and 0.96

*Spots were visualized by spraying with 0.5% anisaldehyde followed by heating for 2 min at 105 °C

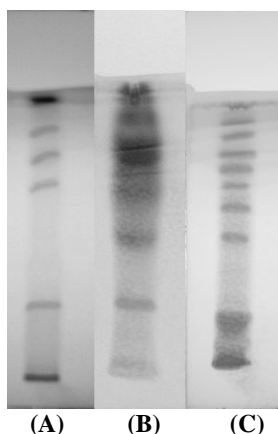


Fig 1: Representative photographs of thin layer chromatograms (A) *n*-hexane extract; (B) chloroform extract and (C) methanol extract of polyherbal formulation.

Authentication of polyherbal formulation is an essential requirement before using it as raw material for research purpose or as medicine. Therefore, it was planned to generate pharmacognostic standards for polyherbal formulation for authenticate the Jwarnashak Panch Kashya. These pharmacognostic standards will help the natural product researcher to select authentic plant material for phytochemical and pharmacological work [8].

4. Conclusion

Finally, it was concluded that various pharmacognostic standards can be effectively and efficiently used for standardization of polyherbal formulation. The results of present research work could be used as reference for the natural product scientists in authenticating Jwarnashak Panch Kashya for phytochemical and pharmacological work.

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