Research Article

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STANDARDIZATION OF KARSHYAHARA YOGA: AN AYURVEDIC NUTRACEUTICAL SUPPLEMENT

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ABSTRACT

Standardization of Ayurvedic formulations is an important step for establishment of biological activity, consistent chemical profile, or quality assurance for production and manufacturing of herbal drugs. Most of the pharmaceutical industries are using substitute drugs instead of authentic drugs. Karshyahara Yoga (KY) is an Ayurvedic polyherbal nutritive drug comprising of *Vidarikanda* (*Pueraria tuberose* (Willd.) DC.) – 1 part, *Godhuma* (*Triticum sativum* L.) – 1 part, *Yava* (*Hordeum vulgare* L.) – 1 part, *Sita* (sugar) – 2 parts and *Pippali* (*Piper longum* L.) – 1/20th part possessing *bhrumhana* (nourishing) action. Aims of the study was to standardize Karshyahara Yoga (KY), employing standard testing protocol for AYUSH drugs. Physico-chemical, proximate and chemical fingerprint studies like loss on drying at 105ºC, total ash, acid insoluble ash, water soluble ash, alcohol soluble extractive, water soluble extractive, total fat, crude fibre, total carbohydrate, total protein and HPTLC performed as per standard methodology. Quality indicating physical and chemical tests was done and standard values for KY were recorded. Standardization tests done on KY helped in authenticating the polyherbal preparation and also in ensuring the quality of the same.

Keywords: Ayurvedic nutraceuticals, Godhuma, Karshyahara Yoga, Vidarikanda, Yava, Pippali

INTRODUCTION

Approximately 85 to 90% of the world's population consumes traditional herbal medicines due to their better tolerance and negligible adverse drug reactions according to an estimate of World Health Organization (WHO).[1] Hence guidelines for the validation of plant based drugs for developing countries like India has been formulated by WHO.[2] As the usage of these herbal medicines has increased, issues regarding their quality, safety, and efficacy have also raised up.[3] It is necessary to authenticate and standardize raw drugs for the establishment of its chemical profile, its biological activity and its quality assurance in order to justify their acceptability in modern system of medicine.[4] There are specific parameters which have been recommended to standardize, and, scientifically validate Ayurvedic preparations.

Karshyahara Yoga (KY)[5] is an Ayurvedic polyherbal nutritive drug comprising of *Vidarikanda* (*Pueraria tuberosa* (Willd.) DC.) – 1 part, *Godhuma* (*Triticum sativum* L.) – 1 part, *Yava* (*Hordeum vulgare* L.) – 1 part, *Sita* (sugar) – 2 parts and *Pippali* (*Piper longum* L.) – 1/20th part. The pharmacodynamic properties of KY comprises of *Madhura rasa* (taste), *Sheetaveerya* (potency), *Guruguna* (qualities) and *Madhura vipaka* (taste after digestion) which pacifies the *Vata dosha* which is one of the main causative factor for *karshya*. Added to this, KY will also do the *bhrumhana* (nourishing) action. *Anupana* (adjuvant) mentioned for KY is *ksheera* (milk), *ghruta* (ghee), *madhu* (honey) and *sharkara* (sugar), which has *brumhana* (nourishing)[6] and *deepana* (appetizer) action. Keeping these views in mind, KY was subjected for standardization to ensure quality and authenticity of the preparation.

MATERIALS AND METHODS

Plant material

The ingredients of KY were collected from the local market of Hassan district, Karnataka state, India. The collected drugs were identified and authenticated at the teaching pharmacy of Department of Dravyaguna, SDM College of Ayurveda and Hospital, Hassan, Karnataka state, India.

Physico-chemical evaluation

Physico-chemical studies like loss on drying at 105ºC, total ash, acid insoluble ash, water soluble ash, alcohol soluble extractive, water soluble extractive and proximate analysis like total fat, crude fibre, total carbohydrate, total protein and HPTLC were carried out as per the WHO guidelines,[7]Ayurvedic Pharmacopoeia of India[8] and Indian Pharmacopoeia.[9]

High Performance Thin Layer Chromatography

One gram of KY was extracted with 10 ml of ethanol. Five and 10µl of the above extract was applied on a pre-coated silica gel F254 on aluminum plates to a band width of 7 mm using Linomat 5 TLC applicator. The plate was developed in chloroform: methanol (6:4). The developed plates were

visualized under 254, 366, and then derivatised with vanillin sulphuric acid and scanned under 254 and 366 nm. R_f, colour of the spots and densitometric scan were recorded.[10]

The studies were done at SDM Centre for Research in Ayurveda and Allied Sciences (AYUSH Centre for Excellence and Recognized SIROs by DSIR), Laxminarayana Nagar, P.O. Kuthpady - 574 118, Udupi, Karnataka state, India as per standard procedure (Sample code: 15060401).

RESULTS AND DISCUSSION

Standardization tests performed for KY were as per AYUSH testing protocol for Churna[11]. KY is found to be wheatish in color (Figure 1) with characteristic odor and sweet taste. The %w/w for physio-chemical parameters like loss on drying, total ash, acid insoluble ash, water soluble ash, alcohol soluble extractive value and water soluble extractive value were 2.6027, 1.089, 0.099, 0.594, 8.915 and 49.725 respectively (Table 1). Loss on drying reveals the moisture content, the sample has 2.6.27% of moisture; total ash is the indication of total inorganic content, 1.089% ash was detected in the sample; acid insoluble ash is the acid insoluble part of total ash, mainly silica, the sample showed 0.099% acid insoluble ash; water soluble ash is the water soluble part of total ash indicating inorganic content without water insoluble inorganic salts like silica, 0.0594% was water soluble; water and alcohol soluble extractive is indicative of percentage active constituents soluble in water and ethanol, the values were 8.915 and 49.725% respectively.

The %w/w for proximate parameters such as fat, fibre, total carbohydrate and total protein were 6.844, 0.0114, 71.056 and 19.295 % w/w respectively (Table 2). Protein, fat and carbohydrate may be acting as sources of energy in KY and the amount was found to be 12.295%, 6.844%, 71.056%, respectively. Hence calorific value was estimated as (71.056 × 4) + (6.844 × 9) + (12.295 × 4) =284.224 + 61.596 + 49.176 = 394.996 Kcal. Amount of total fibre is found to be very less though KY is found to be good source of energy.[12]

TLC photodocumentation (Table 3) showed no spots under 254 and 366 nm, while after derivatisation 4 spots with R_f 0.06, 0.25 (grey), 0.45, 0.72 (light violet) appeared on the plate (Figure 2). Densitometric scan at 254 nm revealed 3 peaks corresponding to 3 different compounds in the ethanol extract, compounds with R_f 0.02 (63.39%), 0.45 (17.83%) and 0.83 (18.78%) were the major peaks (Figure 3a). At 366 nm there were 2 major peaks with R_f 0.06 (43.8%) and 0.77 (56.2%) being the major peaks detected (Figure 3b). HPTLC is an important tool in standardisation and quality control of polyherbal formulations. As there is more than one ingredient qualitative HPTLC fingerprinting can be used for development of quality standards for polyherbal formulations.[13-14]

These physico-chemical constants, results of TLC photo documentation, the unique R_f values and densitogram obtained at different wavelengths can be used as fingerprint to identify Karshyahara yoga. Cite earlier works and other details and elaborate findings substantiated with references, please refer the model papers sent to you.

Table 1: Results of standardization parameters of Karshyahara choorna

Parameters	Results n=3 %w/w
Color	Wheatish
Odour	Characteristic
Taste	Sweet
Loss on drying	2.6027
Total Ash	1.089
Acid Insoluble Ash	0.099
Water soluble Ash	0.594
Diameter (cm)	8.915
Water soluble extractive value	49.725

Table 2: Proximate analysis parameter of Karshyahara choorna

Parameter	Results n = 3 %w/w
Fat	6.844
Fibre	0.0114
Total Carbohydrate	71.056
Total protein	19.295

Table 3: R_f values of the samples at 254 nm (At 9 µl)

At 254 nm	At 366 nm	After derivatisation
-	-	0.06(Grey)
-	-	0.25(Grey)
-	-	0.45(L Violet)
-	-	0.72(L Violet)

*L-Light

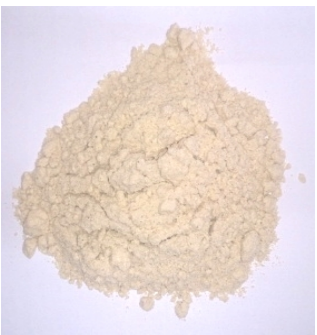

Figure 1: Karshyahara Yoga

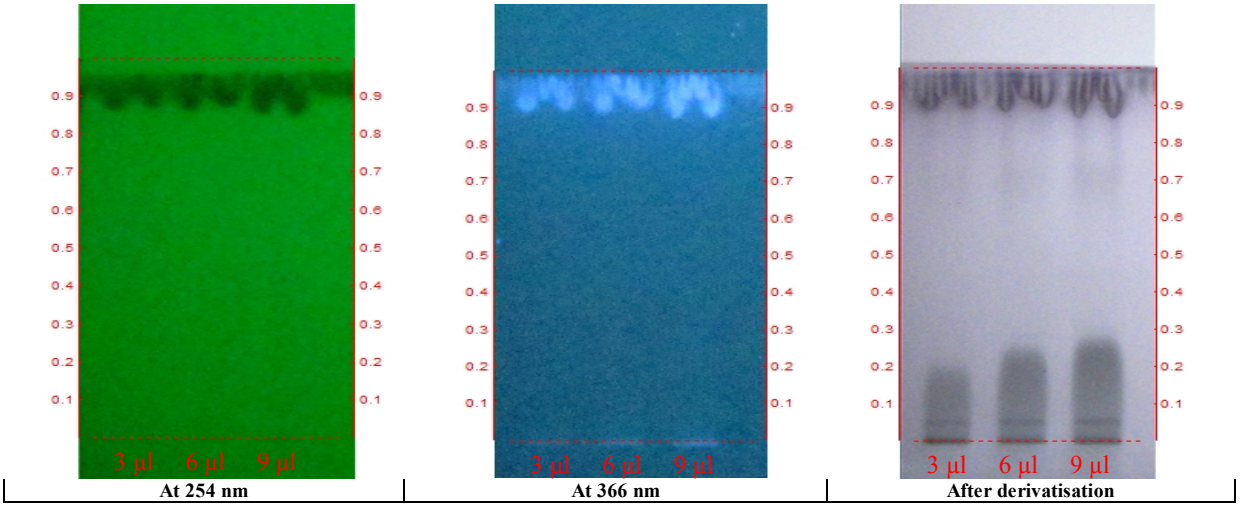

Figure 2: HPTLC photo documentation of Alcohol extract of *Karshyahara choorna*

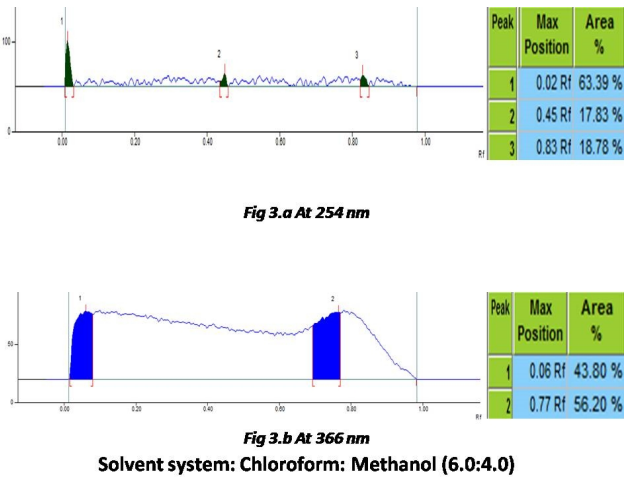

Figure 3: Densitometric scan of *Karshyahara choorna* (At 9 µl)

CONCLUSION

The constituents of *Karshyaharayoga* such as *Vidarikanda* (*Pueraria tuberosa* (Willd.) DC.), *Godhuma* (*Triticum sativum* L.), *Yava* (*Hordeum vulgare* L.), *Sita* (sugar) and *Pippali* (*Piper longum* L.) are endowed with various biological properties and hence this polyherbal nutritive preparation prepared from these ingredients will have combined goodness of all the individual herbs. Standardization of KY carried out using physicochemical, phytochemical studies and HPTLC finger print profiles for the quality control of raw material, processed powder. The purpose of standardization of medicinal plants is to ensure therapeutic efficacy and quality thereby ensuring batch to batch consistency of Ayurvedic medicines. The results obtained through this study were quick, reproducible and could be used for routine monitoring of raw material.

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