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PREPARATION AND PHYSICOCHEMICAL EVALUATION OF *KIRATATIKTA* SYRUP AND *MUKKAAMUKKADUKAADI* SYRUP

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ABSTRACT

Mukkaamukkatukaadi Gulika is a well-known poly herbal antipyretic tablet used especially in Kerala. *Kiratatikta* [Swertia chirata *(Wall.) C. B. Clarke*] is a drug of choice in fevers and is used in decoction form. But it is arduous to consume both formulations in their indigenous forms, particularly in pediatric age groups. So, to surpass the palatability issues both medicines were transformed into syrup formulations. The present work aims at reporting the physicochemical evaluation of *Mukkaamukkatukaadi* syrup and *Kiratikta* syrup. Both the formulations were standardized as per the physicochemical parameters in API. Since these two formulations are not standardized in API, we have attempted to standardize, and it will serve for further research in the area of *Ayurvedic* formulation.

Keywords - *Jwarahara, Mukkaamukkatukaadi Gulika, Physicochemical parameters,* Swertia chirata *(Wall.) C. B. Clarke*

INTRODUCTION

Ayurveda has rich collections of time-tested formulations which have a good antipyretic effect and can be used safely in children. *Mukkaamukatukaadi Gulika* is one such polyherbal formulation explained in Sahasrayoga which is being used for centuries by Vaidyas, especially in Kerala [(1)]. It contains 23 ingredients. *Kiratatikta* [Swertia chirata (Wall.) C. B. Clarke] is a drug of choice in fevers and is used in decoction form [(2)]. But it is arduous to consume both formulations in their indigenous forms, particularly in pediatric age groups. So, to transcend the palatability issues both medicines were transformed into syrup forms. There is little data available on the physicochemical parameters of these drugs. With this background, a study was planned to set standardization for these two syrup formulations.

Materials and Methods

All the ingredients of *Mukkaamukkatukaadi* Syrup (MMS) and *Kiratatikta* Syrup (KS) were procured from the local market of Puttur, India, and were authenticated by the Department of Pharmacognosy and Phytochemistry at SDM Research Centre. The formulations were prepared at SDP, pharmacy, and Puttur. Physico-chemical analysis of both samples was carried out in the Pharmacognosy and Phytochemistry lab of SDM College of Ayurveda, Udupi, India. All the tests were performed as per API (Ayurvedic Pharmacopoeia of India) guidelines.

Preparation of MMS and KS

Method of preparation of MMS

The dried drugs of MMS were collected in a quantity of 15.72g each. The drugs were soaked in water overnight, next day decoction of drugs was prepared by adding 48litres of water, boiled and reduced to 12litres, and filtered, to this 3.6kgs of sugar were added and boiled on mild flame till it is reduced to 6L. The total quantity of suspension obtained was 6L which is cooled down and bottled into 200ml each. They were packed in plastic containers which were sealed and labeled.

Method of preparation of KS

The dried drug of *Kiratatikta* were collected with a quantity of 15.72 g. The drugs were soaked in water overnight, next day decoction of drugs was prepared by adding 48litres of water, boiled and reduced to 12litres, and filtered, to this 3.6kgs of sugar were added and boiled on mild flame till it is reduced to 6L. The total quantity of suspension obtained was 6L which is cooled down and bottled into 200ml each. They were packed in plastic containers, sealed, and labeled. Both formulations were prepared as per the standard method described in the Ayurvedic Formulary of India [(3)].

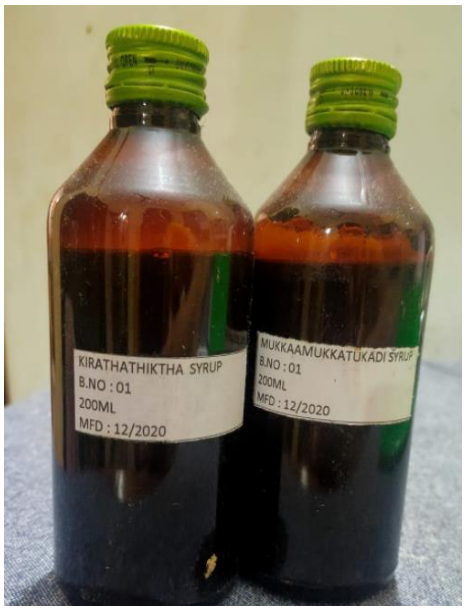

Figure-1 showing prepared MMS and KS

Results

1. Refractive index: The refractive index test [(4)] was performed at 28 ^{0}C and was found to be less in KS as compared to MMS (table 1).
2. Specific gravity: The procedure performed showed specific gravity [(5)] in the MMS sample was more when compared to KS (table1).
3. Viscosity: Viscosity [(6)] were, on the contrary, very less in the KS sample, and was about 16 times more than that of the KS sample in the MMS sample (table 1).
4. Determination of PH [(7)]: KS sample and MMS sample have the same PH as shown in (table 1)
5. Total solids: Total solids [(8)] suggestive of 18.7 in the KS sample and 55.9 in the MMS sample (table 1).

6. Reducing sugar: Reducing sugar [9] was slightly higher in the KS sample while compared to the MMS sample (table 1)
7. Total sugar: Total sugar [10] is suggestive of higher in the KS sample compared to the MMS sample. (Table 1)

Table 1: Depicts the physicochemical parameters of *Kiratatikta* syrup (KS) and *Mukkaamukkadukaadi* syrup (MMS

Standardization parameters for *Kiratatikta* syrup and *Mukkaamukkadukaadi* syrup		
Parameters	*Kirathatiktha* syrup	*Mukkaamukkadukaadi* syrup
Refractive index	1.40979	1.42229
Specific gravity	1.1716	1.2190
Viscosity	1.07	16.77
pH	7.0	7.0
Total solids	18.79	55.90
Total sugar	70.28	63.26
Reducing sugar	22.53	18.76

DISCUSSION

This study reports the physicochemical parameters of two ayurvedic anti pyretic drugs *Mukkaamuk-katukaadi* syrup (MMS) and *Kiratikta* syrup (KS). The Refractive index signifies the clarity and ability of the syrup to change the path of light passing through it. It shows the amount of transparency or opacity. Specific gravity is the number of constituents solubilized in the media or (vehicle). Viscosity signifies shearing stress that is required to disperse the constituents or contents evenly. Hence one can get dose precision while dispersing to a dispenser. Determination of PH-Both formulations are having neutral PH. It can balance acid reflux. Total solids-MMS has more percentage of total solids attributing to its polyherbal constituents whereas KS is a monohedral formulation that yields a smaller number of total solids. Reducing sugar-Reducing sugar is more in KS to neutralize the bitterness. Marogentin is a major constituent that is responsible for bitterness which can be masked when made into syrup formulation. In this there are reducing sugars concentration is more in KS as glucose, fructose, lactose, maltose, and arabinose which are reducing sugars and they have a PH of 6.5 which will neutralize the bitterness of Kiratatikta. MMS has lower reduced sugar indicating its polyherbal ingredients which will not add bitterness as KS so the concentration of reducing sugar is less and still makes it palatable. So, it can be even given to adults with Diabetes. Total sugar is the amount of reducing sugar and non-reducing sugar which is more in KS compared to MMS.

CONCLUSION

MMS and KS were characterized on the basis of physicochemical parameters. The physicochemical parameters obtained in this study may serve as standard reference for the quality control analysis of MMS and KS. Further study has to be conducted in this direction to compare therapeutic efficacy and potency inJwara.

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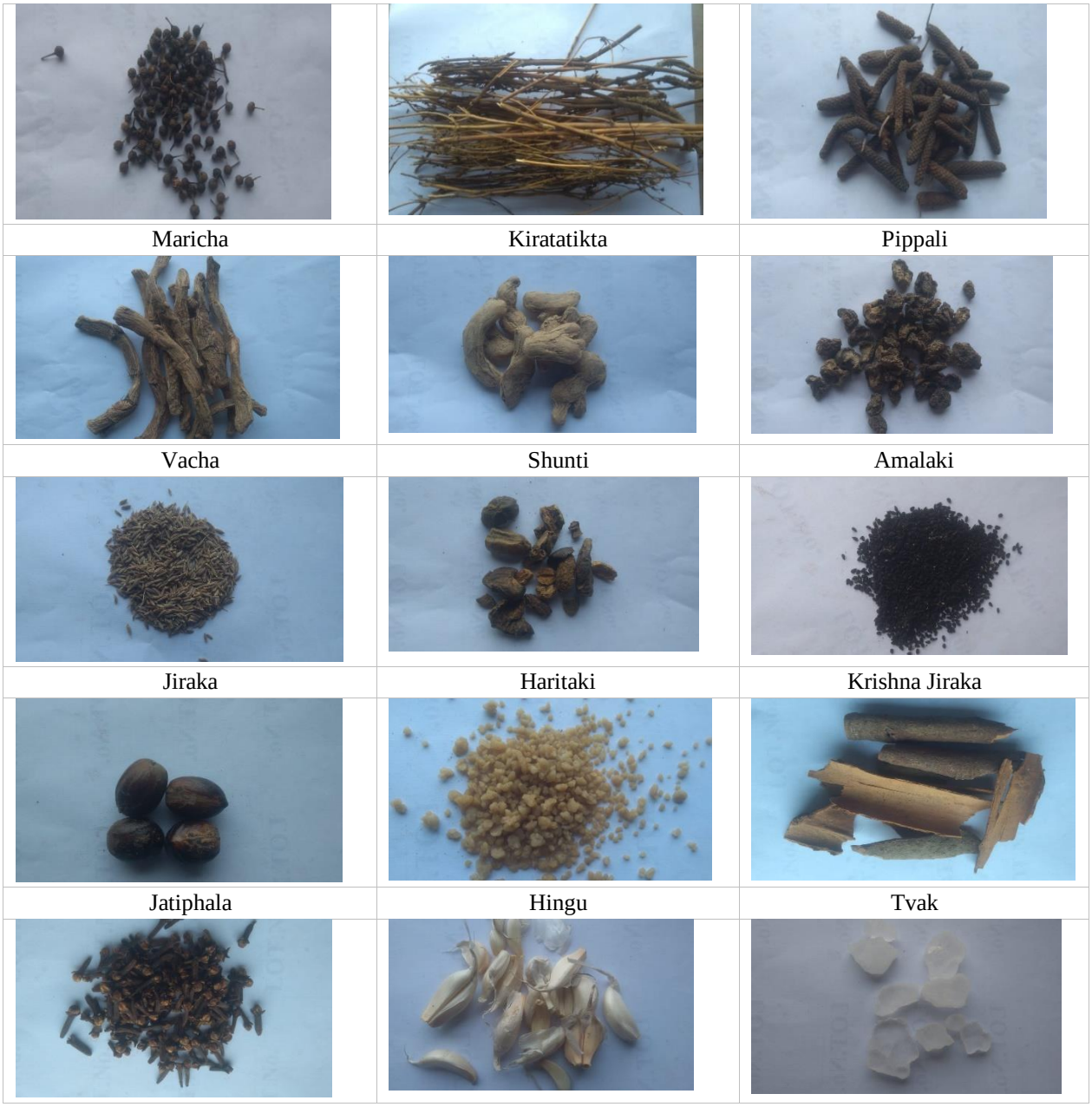
Figure 2: Depicting the Ingredients of *Mukkaamukkadukaadi* syrup (MMS)



Lavanga	Lasuna	Karpura
		
Saindhava	Kusta	Kanyasara
		
Nirgundi	Vibhitaki	

Figure 3: Depicting the Ingredients of *Kiratatikta* syrup

Kiratatikta

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