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Pharmacognostic evaluation and formulation of shampoo using *Sarcostigma kleinii* wight & ARN leaves Fam: Icacinaceae

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Abstract
Diseases are born since man was created and drugs came into existence from that early time to remove pain and to cure these diseases. History of drugs is thus as old as mankind. They are obtained from nature, plants, animals, minerals or are of synthetic origin. Natural drugs obtained from plants and animals are called drugs of biological origin. Active principles usually secondary metabolites, having their therapeutic use are produced in their living cells. Different parts of *Sarcostigma kleinii* usually known in Malayalam as vellodal was used traditionally in rheumatism, leprosy, hysteria and ulcers. The present study deals with the phytochemical, morphological, microscopic evaluation (Transverse sectional view) of fresh leaves and formulation of shampoo from ethyl alcohol extract of *Sarcostigma kleinii* (EAESk). Phytochemical analysis shows the presence of alkaloids, carbohydrates, steroids, triterpenoids, glycosides, flavanoids, tannins and phenols. Transverse sectional view of fresh leaf shows the characters of dicot angiosperms.

Keywords: *Sarcostigma kleinii* leaves, ethyl alcohol extract, phytochemical, morphological and microscopical evaluation, shampoo

1. Introduction
During 1980 to1990 massive growth orient research, resulted in new developments and new advances in the analysis thus awareness of plant materials as drug precursors and drug leads. Evaluation was performed by different techniques like morphological or macroscopical characters, microscopical characters, chemical tests, solubilities, physical constants, which included Spectroscopy and chromatography [1]. *Sarcostigma kleinii* also known in Malayalam as Erumathali, Odal, Vattodal, Vellodal is a woody climber with Leaves- oblong-lanceolate, apex -acuminate, base -rounded or obtuse, petiole- 5-12 cm long, Flowers- 3-6 together, yellow, calyx - 5-toothed; petals- 3-5 mm long, oblong, recurved. Fruits-drupe, ovoid, orange-yellow, glabrous [2]. General habitat Evergreen and semi-evergreen forests, also in sacred groves, Global Distribution Indo-Malaysia. State - Kerala, all districts. The genus *Sarcostigma* is in the family *Icacinaceae* Flowering class: Dicot Habit: Climber [2]. Traditionally fruits are used in rheumatism, fatty oil of seeds considered as a cure for rheumatism, powdered bark mixed with honey is also given in rheumatism, leprosy, hysteria and ulcers. Leaves boiled in oil also used for rheumatism [3, 4]. Angiosperms dicots usually have dorsiventral leaves orienting themselves at an angle to the main axis, net-veined. TS shows upper and lower epidermis covered by a layer of cuticle lower epidermis contains numerous stomata. Mesophyll is a tissue between the upper and lower epidermis which is differentiated into palisade cells (lies towards the upper epidermis) and spongy parenchyma. Numerous vascular bundles are scattered in spongy parenchyma surrounded by large parenchymatous sheath. Collenchyma may also be associated with bundle sheath cells. Xylem lies toward the upper epidermis and phloem toward lower epidermis [5].

2. Methodology
2.1 Collection, identification and extraction of plant materials
Fresh leaves of *Sarcostigma kleinii* were collected from MG University Kottayam, Kerala in July, 2015. The plant was identified and authenticated by Dr. Rogimon P. Thomas, Asst. Professor. Department of Botany, C.M.S. College, Kottayam, Kerala, India. (Specimen voucher no. CMS1754). The collected leaves were washed under running tap water to remove dust particles from the surface. Then the leaves were dried under shade and powered

mechanically. The powdered leaves were extracted using ethanol by soxhlet extraction method for complete extraction [6].

2.2 Preliminary qualitative phytochemical screening of the extract

Preliminary screening of ethanolic extract was conducted to identify various phytoconstituents as per the standard procedures to determine presence of various phytoconstituents [7].

2.3 Morphology and microscopy

Fresh leaves of *Sarcostigma kleinii* were collected from MG University Kottayam, Kerala in July examined morphological characters and sectioned. The sections were stained with Toluidine blue. The staining results were remarkably good; and some cytochemical reactions were also obtained. The dye rendered pink colour to the cellulose walls, blue to the lignified cells, dark green to suberin, violet to the mucilage, blue to the protein bodies etc. Photographs were taken with Nikon lab photo 2 microscopic Unit, under high power magnification. For normal observations bright field was used.

2.4 Formulation and evaluation of antidandruff shampoo

a. Formulation

Ingredients and Procedure [8, 9] for each 100ml of formulation

Sodium lauryl sulphate paste	22 gm
Oleic acid	10gm
Triethanolamine	5gm
EAESk (dried)	01.5 gm
Perfume	qs
Preservative	qs
Colour	qs
Water	qs to make up to 100ml

Mix water, oleic acid and sodium lauryl sulphate paste and heat to 60°C.Slowly add triethanolamine with continuous stirring added EAESk (dried) dissolved in 5ml of water, make up with water to 100ml with continuous stirring. Add perfume cooling to 35°C.

b. Evaluation

Evaluation of shampoos comprises the quality control tests including visual assessment and physiochemical controls such as pH, density and viscosity. Sodium lauryl sulfate based detergents are the most common but the concentration will vary [10].

To evaluate the prepared formulations, quality control tests including visual assessment and physicochemical controls such as pH, density and viscosity were performed. Also, to assure the quality of products, specific tests for shampoo formulations including the determination of dry residue and moisture content, surface tension, and detergency tests were carried out.

1. Physical appearance/visual inspection: The formulations prepared were evaluated in terms of their clarity, foam producing ability and fluidity.
2. Determination of pH: The pH of 10% shampoo solution in distilled water was determ 2. Determination of pH: The pH of 10% shampoo solution in distilled water was determined at room temperature 25°C.
3. Determine percent of solids contents: A clean dry evaporating dish was weighed and added 4 grams of shampoo to the evaporating dish. The dish and shampoo were weighed. The exact weight of the shampoo only was calculated. The evaporating dish with shampoo was placed on the hot plate until the liquid portion was evaporated. The weight of the shampoo only (solids) after drying was calculated.
4. Rheological evaluations: The viscosity of the shampoos was determined by using Brookfield Viscometer (VISCO 895, ATAGO, JAPAN) set at different spindle speeds from20 to 50 rpm. The viscosity of the shampoos was measured by using spindleA1L. The temperature and sample container's size was kept constants during the study.
5. Dirt dispersion: 0.5% and 1% shampoo solutions were prepared,1 drop of India ink was added; the test tube was stoppered and shaken ten times. The amount of ink in the foam was estimated as None, Light, Moderate, or Heavy.
6. Cleaning action: 2 grams of wool yarn were placed in grease, after that it was placed in 200 ml. of water containing 1 gram of shampoo in a flask. Temperature of water was maintained at 35^0C. The flask was shaken for 4 minutes at the rate of 50 times a minute. The solution was removed and sample was taken out, dried and weighed. The amount of grease removed was calculated by using the following equation

DP=100(1-T/C)

DP Percentage of detergency power, T Weight of sebum in test sample, C Weight of sebum in control sample

7. Surface tension measurement: Measurements were carried out with a 10% shampoo dilution in distilled water at room temperature. Thoroughly clean the stalagmometer using acetone and purified water. Because surface tension is highly affected with grease or other lubricants. Data was calculated by following equation

Surface Tension = (No of drops of water x Density of sample/No of drops of sample x Density of water) Surface tension of water

8. Foaming ability and foam stability: Cylinder shake method was used for determining foaming ability. 10 ml of the 1% shampoo solution was put into a 100ml graduated cylinder and covered the cylinder with hand and shaken for 10 times. The total volumes of the foam contents after 1 minute shaking were recorded. The foam volume was calculated only. Immediately after shaking the volume of foam at 1 minute intervals for 4 minutes were recorded.

3. Results

3.1 Phytochemical evaluation

Table 1: Phytochemical evaluation

Phytochemical Constituents	Reagents	Inference
Alkaloids	Dragendr off" reagent Mayer' reagent Hager' reagent	+
Carbohydrates	Molish' reagent	+

	Fehling' reagent	
Proteins and Aminoacids	Biuret' reagent Ninhydrin' reagent	–
Steroids and Triterpenoids	Leibermann Burchard' reagent Salkowski test	+
Glycosides	Borntager' reagent	+
Saponins	Foaming test	–
Flavanoids	Shinoda test	+
Tannins	Ferric chloride Lead acetate	+
Phenols	Ferric chloride	+

Phytochemical analysis from table1 shows the presence of alkaloids, carbohydrates, steroids triterpenoids, glycosides, flavanoids, tannin, phenols etc. in Ethyl alcohol extract of *Sarcostigma kleinii* leaves. (Presence of chicoric acid, protocatechuic acid, hesperidin, quercetin etc. were detected by LCMS which indicates possibility of an antidandruff activity).

3.2. A.

Fig 1: Morphology of *Sarcostigma kleinii* leaf

Dorsiventral leaves orient themselves at an angle to the main axis, net-veined, oblong-lanceolate, apex -acuminate, base - rounded or obtuse, petiole present.

3.2. B.

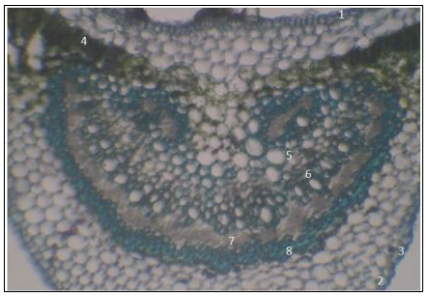

Fig 2: Transverse sectional view of Leaf of *Sarcostigma kleinii*

1. Upper epidermis, 2. Lower epidermis, 3. Cuticle, 4. Palisade cells, 5. Xylem, 6. Phloem, 7. Parenchymatous sheath, 8. Collenchyma.

Upper and lower epidermis-cuticularised, consisting of uniseriate, compactly arranged thin walled parenchymatous tissue. There is spongy tissue mesophyll- between the upper and lower epidermis differentiated into pallisade cells and spongy parenchyma. Palisade cells - lies towards the upper epidermis and consists of one layer of elongated cells, densely packed with intercellular spaces and chloroplasts. Numerous vascular bundles are scattered in spongy parenchyma. Each bundle is conjoint, collateral and closed. Vascular bundle is surrounded by large parenchymatous sheath. Collenchyma may also be associated with bundle sheath cells. Xylem lies toward the upper epidermis and phloem toward lower epidermis. Single mid-vein vascular bundle is larger and several smaller veinlet vascular bundles are smaller.

3.3 Evaluation

Table 2: Physical appearance, pH, and solids, Cleaning action, Surface tension

Physical appearance	Density	pH	Solids %	Cleaning action %	Surface tension
Light green, Good foaming	0.9250±0.0002g/cm^3	7.2±0.3	26.50±0.39	50.35±5.02	43.53±0.28 dynes/cm

Table 3: Viscocity

S. No	Speed(rpm)	Tor %	Viscocity
1	20rpm	8.21	2878mpa
2	30rpm	9.72	2270mpa
3	50rpm	11.4	1600mpa

Table 4: Dirt dispersion

S. No	% of shampoo solution	Dirt dispersion
1	0.5%	Moderate
2	1%	Light

Table 5: Foam stability

Time Minutes	Foam volume (ml)
1	30
2	29
3	28.5
4	28

Conclusion

The qualitative phytochemical analysis of ethyl alcoholic extract of leaves of *Sarcostigma kleinii* showed that it contains a mixture of phytochemicals as alkaloids, carbohydrates, steroids, triterpenoids, glycosides, flavanoids,

tannins etc. Hence a shampoo with possible antidandruff effect was formulated. Evaluation of morphological and microscopical characters of fresh leaves of *Sarcostigma kleinii* showed the characters of major group Angiosperms (Flowering plants and Flowering class: Dicot). Powdered bark mixed with honey is given in rheumatism, leprosy, hysteria and ulcers.

References

1. JS Quadry. Pharmacognosy. 16th edn. Delhi: JS Quadry, JS Offset printers, 2014, 1-8, 32-36.
2. India bio divers ity.org/species/show/248959India
3. https://www.flowersofindia.net/catalog/slides/Ingudi.html
4. Vaidyaratnam TS Varier. Indian Medicinal Plants: A Compendium of 500 Species. 1st edn. Madras: orient Longman Ltd, 1996; 5:76-79.
5. https://www.sciencetopia.net/biology/botany/anatomy-dorsiventral-leaf-dicotyledonous
6. Naina Sara Sabu, Jayachandran TP, Sri Ganesan S. Evaluation of anxiolytic activity of aerial parts of sarcostigma kleinii wight and ARN. Asian Journal of Pharmaceutical and Clinical Research. 2015; 8(2):412-416.
7. Khandelwal KR. Practical Pharmacognosy. 22nd edn. Edited by Vrinda. K. Sethi. Nirali Prakashan, 2012.
8. BM Mithal, RN Saha. Handbook of cosmetics. 1st edn. Delhi: Vallabh Prakasha, 2000, 119.
9. WA Poucher. Poucher's Perfumes, Cosmetics and Soaps. 9th edition. C London: Hapman & Hall. 1993; 3:167.
10. Ashok Kumar, Rakesh Roshan Mali. Evaluation of prepared shampoo formulations and to compare formulated shampoo with marketed shampoos global-research-online. 2010; 3:120-125.
11. http://global-research-online.net/journalcontents/volume3issue1/Article%20025.pdf
12. http://florakarnataka.ces.iisc.ac.in/hjcb2/herbsheet.php?id=2336&cat=1