



FORMULATION AND EVALUATION OF ANTI-DANDRUFF SERUM OF LEAF EXTRACT OF *CYCLEA PELTATA*

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ABSTRACT

Cyclea peltata, also called Padathally or Padakkizhangu, belongs to the family Menispermaceae. Leaf has antioxidant, antihyperlipidemic, hepatoprotective, antifungal and antibacterial properties. Phytochemical studies reveal that the plant contains important components such as furanoline, tetrandrine, cycleanorine, cycleacurine, cycleapeltine, cycleadrine, and D-isochondrodendrine that contribute to its pharmacological properties. Phytochemical screening showed the presence of alkaloids, carbohydrates, steroids, proteins, phenolic compounds and tannins. The purpose of current study was to use the Agar well diffusion method to assess the *C.peltata* leaves significant anti dandruff potential. A hair serum with anti-dandruff property were formulated and evaluated was another goal.

KEYWORDS: *Cyclea peltata*, Anti dandruff activity, hair serum.

INTRODUCTION

Cyclea peltata is a thin, climbing and twining bush that has a place in the family Menispermaceae and is vernacularly called Padathalli or Padakkizhangu. They comprise mostly creepers, generally seen around the tropical parts of Asia, the evergreen and semi-evergreen forests and distributed mainly around Andaman and Nicobar Islands, Assam, Kerala etc.^[1] The active phytoconstituents of the crude drug include alkaloids, Proteins & aminoacids, glycosides, triterpenoids, saponins, gums and mucilage, steroids. phytoconstituents such as alkaloids like cycleapeltine, cycleadrine, cycleacurine, tetrandrine (TET), cycleanorine, and so on, which have been responsible to its pharmacological activities. Dandruff is a common scalp disorder effecting half of the population. It will cause negative effects like dryness of scalp and hair, inflammation of scalp discoloration of the hair and the hair loss. The main cause of dandruff is yeast like fungus *Malassezia*. *Cyclea peltata*, a medicinal plant rich in bioactive constituents are effective in the removal of dandruff.^[2] It is a traditionally used medicinal plant. As it is easily available but neglected and it's variety of medicinal uses so we selected it. Hair serum has a valuable impact on scalp nourishment as it contains plant constituents in high concentration. Herbal serum has been increasingly common in the hair care product, and there is a high demand for them in everyday life due to their lack of

parabens and sulphates. So we focused on the formulation and evaluation of antidandruff hair growth serum using *cyclea peltata*.^[3]

COLLECTION OF PLANT MATERIAL

The studies were carried out in plant material collected from the medicinal garden of Nehru college of pharmacy, Pampady, Thrissur District, Kerala, India. The authenticity of the plant was confirmed with the KSCSTE-Kerala Forest Research Institute, and Institution under Kerala State Council for Science, Technology and Environment, Peechi, 680 653, Thrissur, Kerala. The plant material was then dried under shade for about 50 days, powdered with mechanical grinder and stored in an air tight container.

EXTRACTION

- Dried leaves of *Cyclea peltata* were extracted with ethanol using soxhlet apparatus.
- Leaves were dried under shaded condition at room temperature.
- Dried leaves were crushed to powder using grinding machine
- Powder was stored at room temperature in air tight container.

- To prepare ethanolic extract, leaf powder of *Cyclea peltata* 20 gram was packed in a soxhlet apparatus with 250ml 99% ethanol.
- The extraction was carried out at room temperature for 12 hours with 2-3 cycles per hour until the extract becomes colourless.
- After extraction, sample was filtered by using Whatman No.1 filter paper and gathered in a beaker and collected in a amber bottle to avoid contamination and degradation of the bioactive material by light and temperature.^[4]

INVITRO ANTI-DANDRUFF TEST AGAR WELL DIFFUSION METHOD

Agar well diffusion method is widely used to evaluate the antimicrobial activity of the test sample. Sabouraud

FORMULATION OF ANTI DANDRUFF SERUM

Table no. 01: Formula of antidandruff serum.

SL. NO	INGREDIENTS	QUANTITY
1	<i>Cyclea peltata</i>	2g
2	Xanthan gum	0.3g
3	Sodium benzoate	0.1g
4	Glycerin	1.3ml
5	Tea tree oil	2ml
6	Rose water	0.2 ml
7	Distilled water qs	15 ml

Procedure

Take a beaker, and add xanthan gum (0.3g) and 10 ml distilled water with continuous stirring until it dissolved. To this add 1.3ml glycerine. Then add tea tree oil and sodium benzoate to that mixture with continuous stirring. And a drop of rose water is added. The mixture was transferred to the serum bottle.^[6]

EVALUATION STUDIES OF ANTIDANDRUFF SERUM

Organoleptic test

The prepared sample were inspected visually to check the texture, odour, and the colour of the serum as per Indian Pharmacopoeia procedure.

pH evaluation

The pH measurement of the formulated serum was measured using a digital pH meter 0.^[7]

Viscosity

The measurement of viscosity of the prepared herbal serum was done with Brookfield viscometer (model). The reading was taken at 100 rpm using spindle no. 6.

EXTRACTION

Percentage yield of solvent extract

Table No 02: Observation table of Nature, Colour, Yield of *Cyclea peltata* extract.

Extract	Nature of extract	Colour	Weight %w/w
Ethanolic extract	Semisolid	Dark green	12.5

agar and Potato Dextrose Agar the ratio 1:1 was poured on glass petri plates of same size and allowed to solidify. Standardized inoculum of the test organism *Malassezia* was uniformly spread on the surface of the plates using sterile cotton swab. Four wells with a diameter of 8mm were placed aseptically with a sterile cork borer in each plate. The test sample (50 and 100µg) was added into the disc T1, T2, T3 & T4 from 10mg/ml stock. Ketoconazole (40µl from 1.0mg/ml stock) and the solvent used for sample dilution were added as positive and negative control respectively. The plates were incubated for 48 hours at 35°C ± 1°C, under aerobic conditions. After incubation, the plates were observed and the zone of inhibition around the well was measured in mm.^[5]

Skin irritation test

It is carried out by applying the serum on skin and tested for any redness or itching after two hours.

Homogeneity

A clean and dry object glass was smeared with the hair serum, and a cover glass was sealed. The appearance under the light of some coarse particle/homogeneity was investigated. Herbal hair serum was tested by visual examination for homogeneity and tested for some lumps, flocculates, or aggregates.^[8]

RESULTS

Collection and Authentication of leaves of *Cyclea peltata*

The leaves of *Cyclea peltata* were collected and authenticated. These leaves were subjected to further evaluation.

INVITRO ANTIDANDRUFF ACTIVITY TEST FOR CYCLEA PELTATA EXTRACT

Agar well diffusion method

Table No. 03: Zone of inhibition of leaf extract.

Name of microorganism	Zone of inhibition(mm)					
	Standard Ketoconazole (40µL)	Negative control	T ₁ (12.5µg)	T ₂ (25µg)	T ₃ (50µg)	T ₄ (100µg)
Malassezia furfur	+ve (15.5mm)	-ve	+ve (11.5mm)	+ve (13.5mm)	+ve (14.25mm)	+ve (15.3mm)

+ ve - Refers to antimicrobial activity - ve - Refers to no antimicrobial activity.

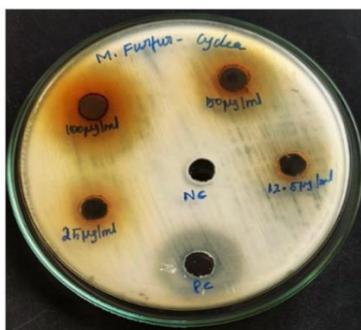


Fig. No 01.

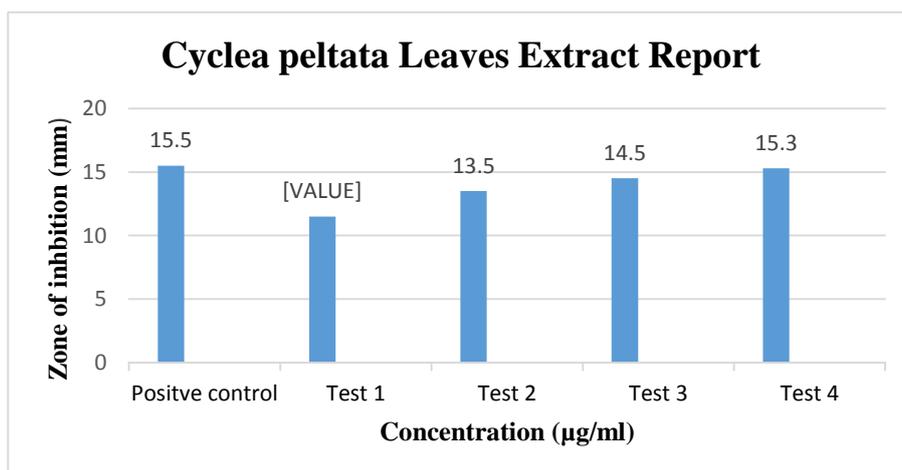


Fig. No. 02: Cyclea peltata leaves extract report.

FORMULATED HERBAL ANTIDANDRUFF HAIR GROWTH SERUM

10 ml of herbal antidandruff hair growth serum using ethanolic extract of Cyclea peltata were prepared.



Fig. No. 03: Herbal Anti-dandruff hair growth serum.

EVALUATION TEST FOR ANTI-DANDRUFF HAIR SERUM**Stability of formulation**

The formulated herbal serum was found to be stable.

Table No. 04: Stability of herbal serum in different parameters.

parameter	formulation			
	Initial	10 days	20 days	30 days
color	Pale yellow	Pale yellow	Pale yellow	Pale yellow
odour	Floral smell	Floral smell	Floral smell	Floral smell
pH	4.6	4.6	4.6	4.6
Skin irritation	No	No	No	No

Physicochemical characterization and evaluation studies**Organoleptic test**

Table No. 05: Physicochemical properties of herbal serum.

Color	Odour	Texture
Pale yellow	Floral smell	Smooth homogenous

pH Evaluation

pH of the prepared herbal serum from ethanolic extract of *Cyclea peltata* leaves was found to be 4.6.

Skin irritation test

From the result of evaluation, There is no redness or itching.

Viscosity

Viscosity of the herbal serum was determined by using Brookfield Viscometer and was found to be 2846poise.

Homogeneity

The homogeneity of the prepared serum has shown to be smooth and homogenous.

INVITRO ANTIDANDRUFF ACTIVITY TEST FOR HAIR SERUM**Agar well diffusion method**

Table No. 06: Zone of inhibition of Hair serum.

Name of microorganism	Zone of inhibition(mm)			
	Standard Ketoconazole (4 μ L)	Negative control	T ₁ (50 μ L)	T ₂ (100 μ L)
<i>Malassezia furfur</i>	+ve (20 mm)	-ve	+ve (17 mm)	+ve (19.5mm)

+ ve - Refers to antimicrobial activity - ve - Refers to no antimicrobial activity

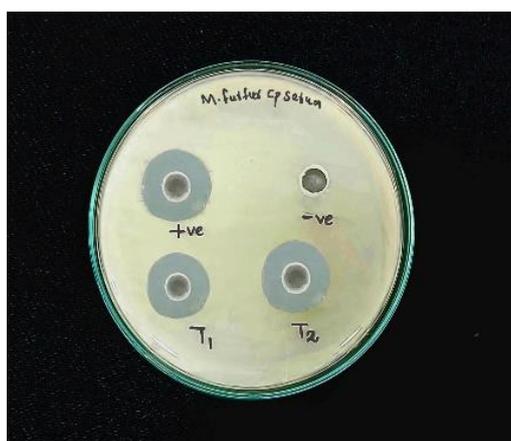


Fig. No. 04.

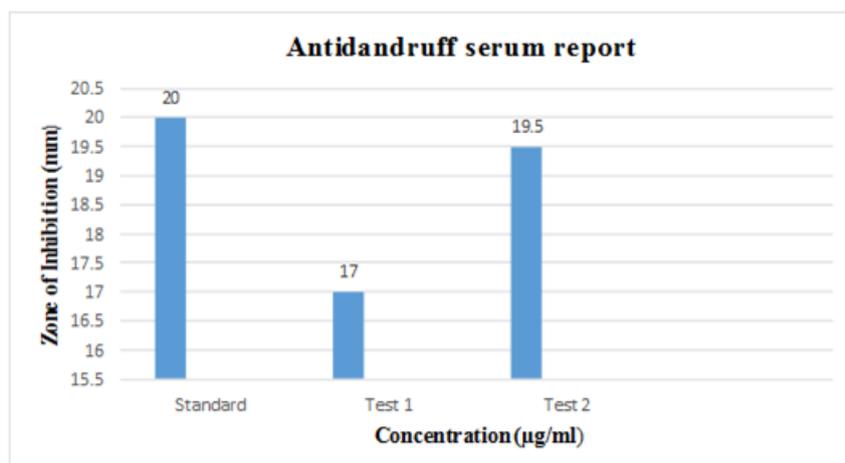


Fig No. 05: *Cyclea peltata* Hair serum report.

CONCLUSION

The leaves were collected from medicinal garden of Nehru college of pharmacy Thrissur district, Kerala region and authenticated. The leaves were subjected to pharmacognostic investigation which includes determination of physical constants such as ash value and extractive values. Macroscopic and microscopic characteristics of the leaf were studied. The leaves of plant were subjected to extraction by using ethanol and the extracts were subjected to phytochemical investigation. The alcoholic extract contains alkaloids, steroids, terpenoids saponins, carbohydrate. The antifungal activities of the leaves were studied by using agar well diffusion method. *Cyclea peltata* is rich in bioactive constituents but it is rarely used in herbal formulations. This plant have an effective role in removal of dandruff. So we choose *Cyclea peltata* in the formulation of hair serum.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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