



## Physicochemical Investigation of Some Herbal Hair Oil

Azra Kamal\*

Forensic Science Laboratory, C.I.D (Police), Patna-800023, Bihar, India.

\*Corresponding author's E-mail: [azrakamal.biochem@gmail.com](mailto:azrakamal.biochem@gmail.com)

Accepted on: 10-12-2014; Finalized on: 31-01-2015.

### ABSTRACT

Hair is one of the vital parts of the body derived from ectoderm of skin, is a filamentous biomaterial that grows from follicles found in the dermis and also a protective appendages on the body. All natural nourishing preparations for dry scalp and hair combines herbal oil extracts traditionally used to treat hair conditions. Herbal formulations always have attracted considerable attention because of their good activity and comparatively lesser or nil side effects with synthetic drugs. Present study was conducted to standardize the selected herbal hair oils for their physicochemical properties, i.e. color, odor, pH, specific gravity, acid value, peroxide value and saponification value. The findings of the study showed that the test oil were complies the requirements for physicochemical parameters prescribed by BIS.

**Keywords:** Herbal hair oil, Physicochemical parameters, Herbal formulations.

### INTRODUCTION

Hair is a uniquely mammalian trait with important functions<sup>1</sup>. Throughout history and in most of civilizations, scalp hair has been associated with positive signals such as beauty and power. Baldness or hair loss on the other hand has a negative attribute<sup>2</sup>. Hair oils are the hair care preparations used for the prevention and treatment of baldness or other ailments, aggression of hair. They also promote the luxurious growth of hairs. Hair oil containing herbal drugs are used as hair tonic. Herbal formulations always have attracted considerable attention because of their good activity and comparatively lesser or nil side effects with synthetic drugs.<sup>3</sup> Present study was conducted to standardize the selected herbal hair oils on physicochemical parameters and some standards prescribed by Bureau of Indian Standards.

### MATERIALS AND METHODS

Himani Navratna oil and Dabur Amla oil were purchased from local market from Patna district of Bihar, India.

Physicochemical evaluation was done using conventional method<sup>4-5</sup>.

#### Physicochemical analyses

##### Determination of color and odor

Color and odor of the oil samples were typical of their constituents.

##### Determination of specific gravity

The specific gravity of the oils were calculated from the following relationship.

$$\text{Specific Gravity at } 30^{\circ}\text{C} = \frac{A-B}{C-B}$$

Where, A = weight of specific gravity bottle with oil at 30°C (g); B = weight of specific

gravity bottle at 30°C (g); C = weight of specific gravity bottle with water at 30°C (g).

##### pH Determination

The digital pH meter was used for pH determination.

##### Determination of acid value

$$\text{Acid value} = \frac{5.61V N}{W}$$

Where, V = Volume of standard sodium hydroxide used (ml); N = Normality of the

sodium hydroxide solution; W = Weight of the sample (g).

##### Determination of peroxide value

$$\text{Peroxide value} = 10 \frac{(a-b)}{w}$$

Where, a = ml of NaOH required to neutralize the substance, b = ml of NaOH required for blank, w = weight of sample in (g).

##### Determination of saponification value

$$\text{Saponification value} = \frac{28.05 (B-S)}{W}$$

Where, S = ml of KOH required to neutralize the substance; B= ml of KOH required for blank; and; W = Weight of the sample taken for the test (g).

### RESULTS

In present study physicochemical evaluation was carried out on Himani Navratna oil and Dabur Amla oil. The various standard tests were performed and the test shows following results as in table 1.

### DISCUSSION

Color and odor of the oil samples were typical of their constituents. The pH of both hair oils were found to be near about neutral, 6.3 of Himani Navratna Oil and 7.0 of Dabur Amla Oil which was in accordance with human



skin. Acid value is an indication of rancid state. Lower the acid value higher the quality of oil. Acid value of both the oils were found to be ranging from 0.8 (Himani Navratna Oil) to 0.9 (Dabur Amla Oil) whereas peroxide value were found to be ranging from 3.0 meq/1000 gm (Himani Navratna Oil) to 2.9 meq/1000gm (Dabur Amla Oil). If Peroxide value is high, the skin irritation coefficient will consequently increase and therefore many fragrances and essential oils have a peroxides index lower than a certain value. Saponification values are highly significant

in the making of soap. It is important that the saponification value is just right too high and the soap might contain too much alkali even though there is sufficient soapiness that it would react with skin whilst a saponification value too small the fatty acid salts will not be sufficient enough to remove or saponify the fat or oil and less soapiness. Saponification value of Himani Navratna Oil was found as 231 and 183 of Dabur Amla Oil<sup>6</sup>.

**Table 1:** Physicochemical analyses of some herbal oil

S.No.	Parameters	Himani Navratna Oil	Dabur Amla Oil
1.	Color	Dark red	Green
2.	Odour	Aromatic	Aromatic
3.	pH	6.3	7.0
4.	Specific Gravity	0.9	0.8
5.	Acid value	0.8	0.9
6.	Peroxide value	3.0	2.9
7.	Saponification value	231	183

## CONCLUSION

This evaluation studies on different brand of herbal oils suggest that, selected parameters may be used in the standardization of herbal hair oil. The findings of the study show that the test oil were complies the requirements for physicochemical parameters prescribed by BIS.

**Acknowledgement:** I am very thankful to Dr. S.R Padmadeo, HOD Dept. Of Biochemistry, Patna Science College, Patna University, Patna and Dr. A.K Ghosh, HOD Dept. of Chemistry, Patna Science College, Patna University, Patna for providing the necessary facilities for carrying out experiments.

## REFERENCES

1. D J Tobin, M Hordinsky, and B A Bernardz, Hair Pigmentation: A Research Update Journal of Investigative Dermatology Symposium Proceedings 10, 2005, 275–279.
2. Rushton DH, Norris MJ, Dover R and Nina B, Causes of hair loss and the developments of hair rejuvenation Int J Cosmet Sci, 24, 2002,17-23.
3. Banerjee PS, Sharma M, Nema RK, Preparation, evaluation and hair growth stimulating activity of herbal hair oil Journal of Chemical and Pharmaceutical Research, 1(1), 2009, 261-267.
4. Bureau of Indian standards, BIS Specification, IS 7123:1993.
5. Indian Pharmacopoeia, ministry of health and family welfare, Controller of publications, Govt. of India, volume 1, 1996, A-78.
6. Joshi P, Nanda D, Nainwal P and Saini P, Standardization of herbal ayurvedic oil formulation- Ksheer Bala Taila Asian Journal of Pharmaceutical Research and Development, 11, 2013, 23- 126.

**Source of Support:** Nil, **Conflict of Interest:** None.

### Corresponding Author's Biography: Azra Kamal



Azra is a post graduate with specialization in Clinical Biochemistry from Patna Science College, Patna University, Patna, Bihar, India. She was teaching as a guest faculty in Department of Biochemistry, Patna Science College, Patna University, Patna, Bihar, India. She currently is working as a Senior Scientific Assistant at Forensic Science Laboratory, CID, Patna, Bihar, India.