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RESEARCH ARTICLE

ANALYTICAL STUDY OF ARKA TAILA- AN EFFICACIOUS REMEDY FOR SKIN DISEASES.

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Abstract

Skin diseases are very common, affecting up to a third of the population at any one time. Skin diseases have serious impacts on life. They can cause physical damage, embarrassment, social and occupational restrictions. Some skin diseases can be life threatening. In *Ayurveda*, all the skin diseases are described under *Kustha roga*. Management of various skin diseases through *Ayurveda* have shown better results in comparison with modern treatment. Use of *Sneha Kalpana* (Medicated ghee and oils) in the management of *Kustha roga* has been vogue since samhitha period. *Arka Taila* is an important formulation described by *Acharya Sarangadhara* in the management of skin diseases like *Pama*, *Kacchu* and *Vicharchika*. An attempt has been made in the present study to prepare *Arka Taila* and standardise it through analytical parameters like Organoleptic properties, Moisture value, Acid value, Saponification value and Iodine value. All the parameters were found to be good and within the standards.

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Introduction:-

Sneha Kalpana is an integral part of Ayurvedic formulations. *Acharya Sarangadhara* described about *Sneha Kalpana* in detail in *Madhyama Khanda*¹. It includes *Ghritha Kalpana* and *Taila Kalpana*. *Taila Kalpana* describes about the detailed preparation of medicated oils used in the management of various diseases. *Taila* is included under the *Chaturvidha Snehas* and is given prime importance after *ghritha*². A separate chapter has been dedicated describing the *guna*, *karma* and indications of *Chaturvidha snehas* in Ayurvedic classics like *Charaka samhitha*³, *Ashtanga sangraha*⁴ and *Ashtanga Hrudaya*⁵. *Sneha Kalpanas* are mainly adopted to extract the active principles of plants and minerals into fatty media and to enhance and hasten the absorption of drugs in the body.

Different medicated oils were used in the treatment of skin diseases depending upon the condition and severity of the disease. *Arka Taila* is one such formulation mentioned in *Sarangadhara samhitha Madhyama Khanda* 9/ 147-148, indicated in *Pama*, *Kacchu* and *Vicharchika*. It contains *Arka patra Swarasa*, *Haridra kalka* and *Sarshapa taila*⁶.

Arka is having properties like *Kustha hara*, *Vatahara*, *Kapha hara*, *Sothahara*, *Vranashodhaka*, *Vranaropaka*, *Krimigna*, *Kanduhara* and *Anulomaka*⁷. *Haridra* possess qualities like *Katu*, *Tikta rasa*, *Ushna Virya*, *Kapha Pitta nashaka* and is indicated in *Twakdosha*, *Prameha*, *Raktavikara*, *Sotha*, *Pandu* and *Vrana*⁸. *Sarshapa Taila* possess properties like *Katu rasa*, *laghu guna*, *Ushna Virya*, *Lekhana*, *Agnidipaka* and is indicated in *Kandu*, *Kustha*, *Krimi*, *Switra*, *Kota*, *Dushta Krimi etc*⁹. By virtue of these properties, *Arka Taila* can be considered as a potent formulation

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in the management of skin diseases. In the present study, *Arka Taila* was prepared according to the general rule of *Sneha Kalpana* i.e., (1:4:16 – Kalka dravya: Sneha dravya: Drava dravya)¹⁰ and it was subjected for different analytical tests like Organoleptic properties, Moisture value, Acid value, Saponification value and Iodine value.

Material and Methods:-

Pharmaceutical study:-

Collection of Raw materials:-

All the ingredients used in the preparation of *Arka Taila* were obtained from the local market of Tirupati. Fresh *Arka Patras* were washed under running water to remove the adhering dust from the leaves.

Preparation of Arka Taila:-

- *Swarasa* was extracted from the fresh *Arka patras* by crushing. *Haridra churna* was made into *Kalka* (Paste) by adding sufficient quantity of water.
- In a stainless steel vessel, 500 ml of *Sarshapa taila* was taken and subjected to moderate heat. Then, 125 g of *Haridra Kalka* and 2 litres of *Arka patra Swarasa* were added to it.
- The mixture was stirred continuously to avoid sticking of contents to the bottom of the vessel.
- Heating was carried out for 3 hours till the *Sneha siddhi lakshanas* appeared viz., by taking the *Kalka* and rolling it between the fingers, a *varti* was formed. It was put on the fire and no crackling sound was produced.
- Then the vessel was taken out from the stove and the contents were filtered through a double layered clean muslin cloth.
- 420 ml of *Arka taila* was obtained and it was stored in a clean, dry air tight glass container after self-cooling.

Analytical Study:-

Organoleptic Characters:-

Arka Taila was tested for the taste, odour, colour, appearance, touch and clarity.

Physico – Chemical parameters:-

Acid Value¹¹:-

The acid value of an oil or fat is defined as the number of milligrams of Potassium Hydroxide required to neutralize the free acid in one gram of the sample, when determined by the following method.

Procedure:-

Oil sample was taken in a 250 ml flask and 50 ml of a mixture of equal volumes of alcohol and solvent ether, which has been neutralized after the addition of 1 ml of solution of phenolphthalein was added. It was heated gently in a water bath and titrated with 0.1 N Potassium hydroxide. It was shaken constantly until a pink colour which persists for fifteen seconds was obtained. The number of ml required was noted.

$$\text{Acid value} = \frac{a \times 0.00561 \times 1000}{W}$$

Where 'a' is the number of ml of 0.1 N potassium hydroxide required and W is the weight in gram of the substance taken.

Iodine value¹²

The Iodine value of a substance is the weight of iodine absorbed by 100 parts by weight of the substance, when determined by following method.

Iodine Monochloride method:-

Oil sample was accurately weighed in a dry iodine flask of 250 ml capacity, and 10 ml of carbon tetrachloride was added and dissolved. 20 ml of iodine monochloride solution was added; stopper was inserted, previously moistened with solution of potassium iodine and allowed to stand in a dark place for thirty minutes. Then 15 ml of potassium iodine and 100 ml of water was added, and whilst shaking the contents of the flask, it was titrated with 0.1 N sodium thiosulphate using solution of starch as indicator. The number of ml required (a) was noted. At the same time the

operation in exactly the same manner was carried out, but without the substance being tested, and the number of ml of 0.1 N sodium thiosulphate required (b) was noted.

$$\text{Iodine value} = \frac{(b-a) \times 0.01269 \times 100}{W}$$

Where 'W' is Weight of Sample in grams

Moisture value¹³

The moisture value is the ratio of mass of water in a sample to the mass of solids in the sample, expressed as a percentage.

Procedure:-

Accurately weighed oil sample without preliminary drying was taken in a tared evaporating dish. After placing the sample in the tared evaporating dish, it was dried at 105°C for 5 hours and weighed. Drying and weighing was continued at one hour interval until difference between two successive weighing corresponds to not more than 0.25 percent. The difference in the weight, before and after heating indicates amount of moisture value.

$$\text{Moisture value} = \frac{M_w}{M_s} \times 100$$

Where M_w = mass of water content in sample (*i.e.*, initial mass of sample minus mass of oven dried solid sample).
 M_s = mass of oven dried solid sample.

Saponification value¹⁴

The Saponification value is the number of milligrams of Potassium hydroxide required to neutralize the fatty acids resulting from the complete hydrolysis of 1 gram of the sample.

Procedure:-

Oil sample was taken into a tared 250 ml conical flask and 25 ml of the alcoholic solution of Potassium hydroxide was added. Reflex condenser was attached and boiled on a water bath for 1 hour by frequently rotating the contents of the flask. Then 1 ml of Phenolphthalein solution was added and excess of alkali was titrated with 0.5 N Hydrochloric acid. The number of ml required was noted.

a) The experiment was repeated with the same quantities of the same reagents in the manner omitting the substance. The number of ml required was noted.

$$\text{b) Saponification value} = \frac{(b-a) \times 0.02805 \times 100}{W}$$

Where 'W' is the Weight in grams of the substance taken.

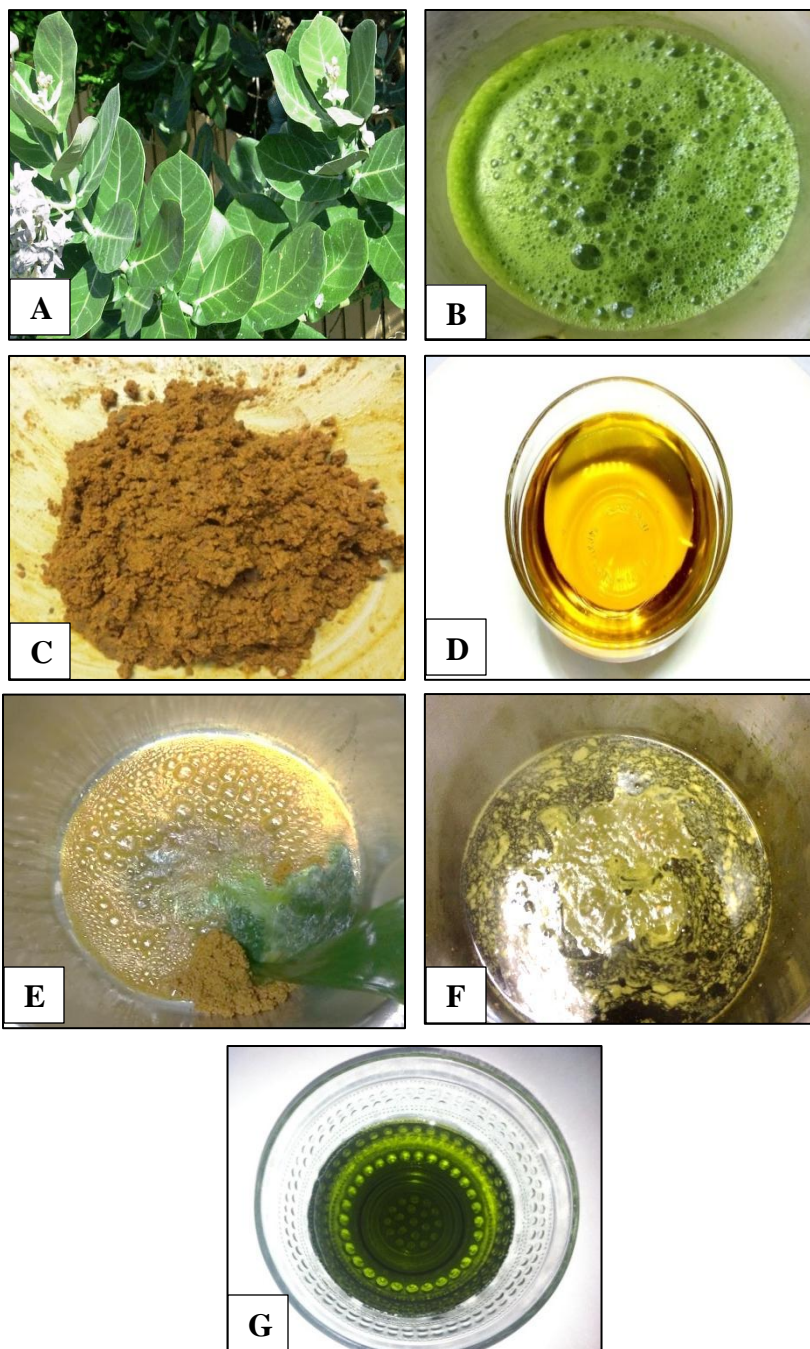
Results:-

Table No. 1:- Showing Organoleptic Parameters.

S.No	Parameters	Result
1.	Colour	Greenish
2.	Odour	Like <i>Arka patra Swarasa</i>
3.	Appearance	Viscous liquid
4.	Touch	Unctuous
5.	Clarity	Transparent
6.	Taste	Pungent

Table No. 2:- Showing Physico-chemical Parameters.

S.No	Parameters	Result
1.	Acid value	0.57
2.	Saponification value	216.73
3.	Iodine value	72.67
4.	Moisture value	1.08 w/w

**Figure:-** A - Arka Patra; B - Arka Patra Swarasa; C - Haridra Kalka; D - Sarshapa Taila; E- Addition of Kalka and Swarasa to Sarshapa taila; F - Boiling of oil during Snehapaka; G- Arka taila.

Discussion:-

Arka Taila is a unique formulation mentioned in *Sarangadhara samhitha Madhyama Khanda, Sneha Kalpana adhyaya* for *Pama, Kacchu* and *Vicharchika*.

- *Pama, Kacchu* and *Vicharchika* come under *Kshudra Kushta*¹⁵. All varieties of *Kushta* are caused by simultaneous vitiation of all the three *doshas*. However some *doshas* are predominant and others are not.
- *Pama* is characterized by *Kandu* (Excessive itching), *sweta, aruna, shyava pidaka* (eruptions). It is mainly caused by the vitiation of *Pitta* and *Kapha dosha*¹⁶.
- *Kacchu* is a type of *Kushta* similar to *Pama*. In addition it has severe burning sensation¹⁷.
- *Vicharchika* is characterized by *Shyava pidaka* (blackish brown eruptions), *Kandu* (itching) and *Bahu srava* (excess exudation). It occurs due to the vitiation of *Kapha dosha*¹⁸.
- *Arka, Haridra* and *Sarshapa taila* present in *Arka Taila* possess *Kapha hara, Pitta hara, Kandughna, Kusthaghna* and *Twak dosha hara* property. Due to the presence of these properties, external application of *Arka Taila* in these disease helps in reducing the symptoms by alleviating the aggravated *Kapha* and *Pitta doshas*.

Acid Value:-

The acid value is a common parameter in the specification of fats and oils. It is defined as the weight of KOH in mg needed to neutralize the organic acids present in 1g of fat and it is a measure of the free fatty acids (FFA) present in the fat or oil. An increase in the amount of FFA in a sample of oil or fat indicates hydrolysis of triglycerides. More acid value means more free fatty acids. The reduced acid value indicates less percentage of free fatty acids or in other words stable nature of fatty acids. Stable nature indicates the prolonged shelf life. Acid value of *Arka Taila* is **0.57**, which indicates its stable nature.

Saponification Value:-

The saponification value is the number of milligrams of potassium hydroxide required to neutralize the fatty acids resulting from the complete hydrolysis of 1g of fat. It gives information concerning the character of the fatty acids of the fat- the longer the carbon chain; the less acid is liberated per gram of fat hydrolysed. It is also considered as a measure of the average molecular weight of all the fatty acids present. The long chain fatty acids found in fats have low saponification value because they have a relatively fewer number of carboxylic functional groups per unit mass of the fat and therefore high molecular weight. Higher the molecular weight of the fat, the smaller is its saponification value. Saponification value of *Arka Taila* is **216.73**, which indicates the presence of higher content of low molecular weight fatty acids. Low molecular weight fatty acids get quickly and easily absorbed into the body system.

Iodine value:-

The most important application of the iodine value is to determine the amount of unsaturation contained in fatty acids. This unsaturation is in the form of double bonds which react with iodine compounds. Unsaturated fatty acids can be converted into saturated by the process of hydrogenation. The higher the iodine value, the more unsaturated fatty acid bonds are present in a fat. Iodine value is used as a parameter in process control as well as a quality parameter in oil products. Iodine value of *Arka Taila* is **72.67** indicates less iodine value. Less Iodine value indicates that it is less vulnerable to lipid peroxidation (Rancidity).

Moisture Value:-

Moisture analysis involves the amount of moisture content and the concentration of moisture by measuring it qualitatively and quantitatively. Moisture content affects the physical, chemical aspects of drug which relates with the freshness and stability for the storage of the drug for a long period of time. Moisture content analysis is important in determining the shelf life of drugs and products. Excess moisture value will encourage microbial growth, the presence of fungi or insects and deterioration following hydrolysis. Moisture value of *Arka Taila* is **1.08** indicates long shelf life.

Conclusion:-

From the present study, it can be concluded from the analytical parameters, that *Arka Taila* has stable nature with less unsaturated fatty acids, low molecular weight fatty acids and long shelf life. By considering the properties of the component drugs of *Arka taila* and the results of Analytical parameters, *Arka Taila* can be considered as an efficacious formulation in the management of skin diseases.

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