ORIGINAL RESEARCH PAPER	Cosmetology
TO STUDY THE *VARNYA* PROPERTY OF *YAVADI ANULEPAN* WITH SPECIAL REFERENCE TO MELANIN PIGMENTS"	KEY WORDS:

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INTRODUCTION :

This study was planned to see the effect of *Yavadi Anulepan* on melanin pigments. These are the pigments present in the basal layer of epidermis, which is accountable for the colour of skin. More in number the pigments, skin colour is darker and when it is less in number skin is fair. In this era, everyone wants to look fair and beautiful. There are many products available in market for that purpose.[1]

In ancient text there are many references of various *lepa* which is useful for good skin complexion, for acne, black spot etc. One of them was *Yavadi lepa*, which was selected for study and used as an *Anulepana,* the part of the *Dincharya*.[2] Purpose of this study was to explore this preparation as a cosmetic product which is already mentioned in *Ashtang Hrudaya*.

The Aim of this study was to study the effect of *Yavadi Anulepan* on Melanin pigments, and objectives were as follows:

Primary objectives:
1) To study the effect of *Anulepan* as *Upakrama* of *Dinacharya.*
2) To study the effect of *Abhyanga's Varnya* property as mentioned in *Dinacharya.*

Secondary Objectives:
1) To study the *Yavadi Anulepan* in detail.
2) To review the literature regarding to the melanin pigments.
3) To explore the importance of *Ayurvedic* cosmetics in this era.

Literature Review:
1. Ayurvedic Review; Anointing[3]: (*Anulepan*)
Anointing is an act of pouring aromatic oil over a person's head or entire body. The term is also applied to related acts of smattering, or smearing a person or object with any perfumed oil, milk, butter, or other fat. Scented oils are used as perfumes and sharing them is an act of hospitality. Their use to introduce a divine influence or presence is recorded from the earliest times; anointing was thus used as a form of medicine. The daily regime or routine which should be followed by individuals is called *Dinacharya*. *Anulepan* is mentioned in *Dincharya upakrama* after taking bath.

1. Modern Review;
The skin consists of two principal parts. The outer, thinner portion which is composed of epithelium is called as Epidermis. The epidermis is attached to an inner, thicker, connective tissue part called as Dermis.[4]

It is a pigment that produces different colors in skin and hair. Melanin protects skin from damaging UV rays. It functions like an antioxidant by quenching free radicals. In fact, it is an efficient antioxidant. Each different location contains different types of Melanin, such as Nuromelanin in the brain and Eumelanin and Pheomelanin in the skin. The both Melanins are synthesized at the deepest layer of Epidermis i.e. Stratum basal. The special cells are present in basal layer called **Melanocytes**, which produce Melanin containing packets, called **Melanosomes**. This process is termed as **Melanogenesis.**[5]

MEXAMETER[6]:-
It is an Instrument which use to measures melanin pigments on the skin. The Mexameter MX 18 is a very easy, quick and economical tool to measure the two components, mainly responsible for the colour of the skin: melanin and hemoglobin by reflectance. There are many fields of application where changes in the skin colour are of interest. The instrument is worldwide established and used in many scientific studies.

Fitzpatrick Classification Scale[7]:
The Fitzpatrick Classification Scale was developed in 1975 by Harvard Medical School dermatologist, Thomas Fitzpatrick, MD, PhD. This scale classifies a person's complexion and their tolerance of sunlight. It is used by many practitioners to determine how someone will respond or react to facial treatments, and how likely they are to get skin cancer. (Table 1)

Drug Review:[8-12] was collected from various *Ayurvedic* and modern text books, journals and Websites. (Table 2)

Methodology:-
This study was carried out on 30 individuals who were selected from Girls hostel of research institute by inclusion and exclusion criteria having same life style. There were two groups in 30 individuals i.e. Trial group and Control group.
1. Trial group: Left forearm of 30 individuals.
2. Control group: Right forearm of same 30 individuals.

3.Yavadi Anulepan :
Yavadi lepa was prepared by cream preparation method in *Rasashastra* department of research institute under the guidance of department of cosmetic technology of other institute. After getting the standardization certificate from authorized laboratory, *lepa was* given to study individuals and advised to apply the *lepa* for 30 subsequent days on left forearm on experimental site which was 5x5cm, 3cm below the imaginary line between two epicondyle of humerus and strictly prohibited for any other application of cosmetics on both hands.

Assessment criteria:
Objective parameter:
1.Mexameter - It is the instrument useful to measure the melanin pigments. Reading of the pigments is in number. This reading was taken in both groups on day 1 and day 31 of application of *lepa*.

2.Fitzpatrick scale- This scale classifies a person's complexion and their tolerance of sunlight. By this scale individuals were selected for the study of IV and V type skin colour. Also the scale was used as the objective parameter. By this scale individuals were assessed on day 1, day 15and day 31.

Subjective parameter:
Assessment by subjective parameter was also done on day 1, day 15 and day 31. The subjective parameters were as follows:

1. Texture of Skin. (By *Darshan, Sparshan and Prashna Pariksha*)
a) *Snigdha*-   Yes – 1 ; No – 0
b) *Ruksha* –   Yes – 1 ; No – 0
c) *Shlakshna* – Yes – 1 ; No – 0
d) *Khara* -   Yes – 1 ; No – 0

2. Lomvarna – a) Black
b) Golden Brown

Observation and results: - It was drawn after statistical analysis.

Important findings of this study are as follows:
1.Mexameter was the first objective parameter which was used to count the melanin pigments in both the groups on day 1 and day 31. In control group the count of melanin pigment was significantly reduced while in trial group melanin pigments increased significantly.

2.Fitzpatrick scale was another objective parameter. The assessment was done by this scale on day 1, day 15 and day 31; but there was no change in the gradation of scales in both the groups.

3.Subjective parameters were the **Texture of the skin** and **Lomvarna** (colour of hairs); from which there was no effect seen on *Lomvarna* while positive effects were seen on texture of the skin. For good texture of skin *Snigdhata* and *Shlakshnata* is important which is significantly increased in trial group and there was no changes in *Snigdhata* and *Rukshata* in control group. As *Snigdhata* and *Shlakshnata* increased in trial group at the same time *Rukshata* and *Kharata* decreased significantly and it is good for the texture of skin. In control group there were no changes in *Rukshata* and *Kharata* of the skin.

4.The observation and result shows that by the application of the *Yavadi Anulepan* does not reduce the melanin pigments but to maintain the good structure of the skin it is useful.

DISCUSSION :
In trial group the pigment reading was increased significantly along with increase in grading of subjective parameter like *Snigdhata* and *Shlakshnata*. The skin complexion, texture was good. But the changes in melanin pigments on comparison were not found significant. But still *Anulepana* showed positive changes on subjective criteria. This might be due to other factors that have impact on skin like faulty food habits, *Ratraujagran* (late night sleep), stressful condition. So further study with bigger sample size with intervention of lifestyle management may show significant result.

This study shows some positive direction in field of cosmetology for further research. As results were not significant but it was encouraging. This study also proves that *Varnya* is the term including texture, feel, complexion, colour and melanin pigments of the skin. It is not only associated with the fairness and darkness. Also other study can be planned in hypopigmentation condition of skin

CONCLUSION :
•   *Yavadi Anulepan* increases the Melanin pigment count.
•   *Yavadi Anulepan* reduces the *Rukshata* (dryness) and *Kharata* (roughness).
•   *Yavadi Anulepan* increases the *Snigdhata* and *Shlakshnata* of the skin, as mentioned in the *sutra*, the skin becomes like the *Padma* (lotus) which is smooth, soft and glowing.
•   Thus, *Yavadi Anulepan* shows the *Varnyakar* property in terms of reducing *Rukshata*, *Kharata* by making good texture of skin.
•   *Yavadi Anulepan* does not increase the fairness of the skin.
•   *Yavadi Anulepan* doesn't have any effect on *Lomvarna*.
•   As there was no change in gradation of Fitzpatrick scale it can conclude that the *Yavadi lepa* does not have significant effect on the colour of skin.
•   Subjective parameters show very much improvement as compared to objective parameters.

Table & charts
Table 1 : Skin Type, Skin Color & Characteristics

Skin Type	Skin Color	Characteristics
I	White; very fair; red or blond hair; blue eyes; freckles	Always burns, never tans
II	White; fair; red or blond hair; blue, hazel, or green eyes	Usually burns, tans with difficulty
III	Cream white; fair with any eye or hair colour; very common	Sometimes mild burn, gradually tans
IV	Brown; typical Mediterranean caucasian skin	Rarely burns, tans with ease
V	Dark Brown; mid-eastern skin types	very rarely burns, tans very easily
VI	Black	Never burns, tans very easily

Table 2 : Drug Review

Sr	Name	Rasa	Virya	Guna	Karma	Latin name
1	Yava	Kashaya, Madhur	Sheet	Guru, Ruksha	Lekhan, Varnya	Hordeum vulgarae
2	Sarjarasa	Kadhaya, Madhur	Sheet	Ruksha	Varnya, Ropan	Shorea robusta
3	Lodhra	Kashaya	Sheet	Laghu, Ruksha	Sthambhan	Symplocus rasemosa
4	Ushira	Tikta, Madhura	Sheet	Laghu, Ruksha	Dahashamak, Varnya	Vetiveria zizaniodis
5	Chandana	Tikta, Madhura	Sheet	Laghu, Ruksha	Dahashamak, Varnya	Santalum album
6	Madhu	Madhura Kashaya	Sheet	Guru, Snigdha	Varnya, Shodhan, Ropan	
7	Ghrita	Madhura	Sheet	Guru,Snigdha	Lavanya,Kanti, Tejovrudhikara	
8	Guda	Madhura	Natishit	Snigdha	Asrikprasadana	
9	Gomutra	Katu, Lavana	Ushna	Laghu, Ruksha	Kushta, Kanduhara	

Table No.3:- Changes in grade of Fitzpatrick scale in both groups on day 1, day 15 and day 31.

	No of Individuals					
	Control Group			Trial Group		
Grade	Day 1	Day 15	Day 31	Day 1	Day 15	Day 31
IV	19	19	19	19	19	19
V	11	11	11	11	11	11
p-value	1.000,NS			1.000,NS		

Graph 1:- Changes in grade of Fitzpatrick scale in both the groups on day 1, day15 and day 31.

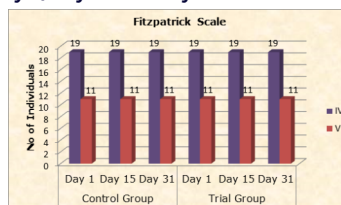**Table.4:- Changes in Mexameter reading in both groups on day 1, day 15 and day 31.** (paired t-test)

	Control Group		Trial group	
Time	Day 1	Day 31	Day 1	Day 31
Mean	419.06	413.3	403.63	408.36
SD	71.97	70.61	77.26	79.62
Median	405.5	397	384	385
Range	306-579	308-607	297-661	315-659
t-value	2.5625		5.0247	
p-value	0.0158, Significant		<0.0001, HS	

Graph No.19:- Changes in Mexameter reading in both groups on day 1, day 15 and day 31.
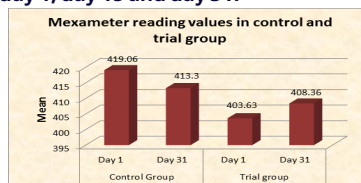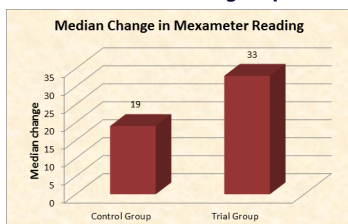
Table 5:-Table showing Comparison of Median change in Mexameter reading between Control and Trial group. (Mann-whitney test)

	Control Group	Trial Group
Mean change	5.43	4.93
SD	32.98	38.08
Median	19	33
Range	-84 - 83	-54 - 131
Z-statistic	1.301	
p-value	0.1932, NS	

Graph no. 3:- Comparison of Median change in Mexameter reading between Control and Trial group.

Median Change in Mexameter Reading

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