Critical Study of Gandhashastra with Special Reference to Rasashastra and Bhaishajya Kalpana

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Abstract: Gandhashastra, a Science of Cosmetology and perfumery was contemporary to ancient Ayurveda. The modern day herbal cosmetology has its roots in the Gandhashastra. It deals with the formulations meant for Face care, Body care, Oral care, Hair care and the perfumery products like Fragrant water, Fragrant fabric, Armpit deodorants and the Room-fresheners. The Gandhashastra, while preparing the gandhakalpanas have utilized most of the basic principles of Rasashastra & Bhaishajya Kalpana. The present paper deals with the Critical study of Gandhashastra with special reference to Rasashastra & Bhaishajya Kalpana.

Keywords: Gandhashastra, Gandhakalpanas, Rasashastra, Bhaishajya Kalpana.

I. Introduction:

From Vedic times, India has witnessed great civilization and cultures. It has also witnessed the development of sciences like Shilpashastra, Jyotishashastra, Ganitashastra, Pakashastra, Dhatushastra, Vyakaranashastra, Gandhashastra as well as Ayurveda. All these shastras were contemporary to ancient Ayurveda. The basic principles of these sciences were applied to each other. Sushruta has rightly stated the need of studying the contemporary sciences.

Gandhashastra, a science of Gandhas i.e. cosmetics and perfumes was contemporary to ancient Ayurveda. A rare manuscript viz.Gandhasara by Gangadhara (12th Century A.D.) and Gandhavada by an anonymous author is the base of this research work. The literature pertaining to Gandhashastra is scattered right from the Vedas to the modern day Ayurvedic texts. This research work is an exploratory study where the primary and secondary data was used for critical study. The Gandhashastra has applied the basic science and technologies described by Rasashastra and Bhaishajya Kalpana. It also has a strong resemblance to the cosmetics industry. This paper deals with the Critical study of Gandhashastra with special reference to Rasashastra and Bhaishajya Kalpana.

II. Literary View:

The literature regarding Gandhashastra is widely scattered. The Vedas-Upanishadas-Puranas-Smrutis-Samhitas are the sources referred for literature of Gandhashastra.

Scientific base of Gandhashastra:-

1) It states that a Gandhadravya should be subjected to the following Six processes viz.
   Bhavana, Pachana, Bodhana, Vedhana, Dhupana and Vasana. These processes are summarized as follows:
   Bhavana: It is a maceration process where a solid base is macerated by a liquid base. It is done for 5-6 times. This process is used for the preparation of gandhodaka, mukhavasa and udvartana etc.
   Pachana: It is a process of baking or ripening. Here a solid base is baked with the help of various yantras. It has 11 sub-types. This process is used for the preparation of gandhataila and kusumdruti etc.
   Bodhana: It is the process of intensification where a solid base is intensified by another solid base. It is done for about a week for the preparation of udvartana and mukhavasa etc.
   Vedhana: In this process a liquid base is intensified by another liquid base. This process is done once for preparing niryasa, parijata and dipataila etc.
   Dhupana: It is the process of fumigation where a solid base is fumigated by a gaseous base. It is done once for preparing udvartana and mrugaraja etc.
   Vasana: In this process of transmission of scents a solid or liquid base is made fragrant by a gaseous base; used to prepare gandhatala and jalavasa etc.

2) Gandhayukti (Blending Techniques for Perfumes as described by Varahamihira)
   From Vedas, it states that out of the group of 16 Substances, the number of Perfumes that can be prepared by selecting any 4 at a time will be 1820 i.e.
   \[ n(n-1)(n-2) .... (n-r + 1) \]
   \[ \frac{nCr}{1.2.3 ....... r} \]

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Where \( n = 16 \) (total number of drugs)
\( r = 4 \) (no. of drugs taken at a time)
\[ C_4^{16} = \frac{16!}{12! \times 4!} = 1820 \]
Thus Varadhamihira has described a Blending technique of the Perfumes, which was further applied by Gangadhara.

3) Preparation of artificial scents by Rasaratnakara e.g. Chandana, Karpura, Kasturi, Kumkuma.
4) Preparation of artificial scents by Haramekhala.
Haramekhala, a Pali text describes the preparation of artificial scents using the unique method of Fermentation.
5) Agreeability of the Gandhadavyas:
Depending on the agreeability of the gandhadavyas, they were classified as Shatru (non-agreeable); Mitra (agreeable) and Udasina (neutral) dravyas.
6) Gandhadrayanighantu:
Gandhasara has described a unique Gandhadraya-nighantu which deals with synonyms of aromatic substances, classification of them, method of testing their genuineness, grahya and agrahya gandhadrayas, precautions regarding collection and storage of drugs, abhava varga (substitutes).

This description is sufficient enough to prove the scientific base of Gandhashastra.

Aims and Objectives:
1. To have a conceptual study Gandhashastra with reference to Rasashastra and Bhaishajya Kalpana.
2. To prepare 4 gandhakalpas by traditional and modern methods.
3. To have an analytical study of these gandhakalpas.

III. Materials and Methods:

1. Conceptual Study:
a) Contribution of Rasashastra to Gandhashastra
   The yantras (equipments) are the back-bone of Rasashastra. Gandhashastra has used some of these yantras for preparing the gandhakalpas eg.
   Dolayatra – Snaniya jalavasa, gandhadraya svedana.
   Patana Yantra – Arka nishkasana
   Nalika Yantra – Gandhodaka nirmana
   Patala Yantra – Kusumadi druti nirmana
   Khalva Yantra – Bhavana, bodhana, vodhana, parijata, gandhodaka, jalavasa etc.
   Samuputa Yantra – Putapaka, gartapaka, kharpapaka
   Bhudhara Yantra – Gartapaka
   Dhupana Yantra – Mukhavasa, gandhatala, dhupa, niryasa, syanda etc.
   Ulukhala Yantra – Vasana Samskara
   Svedani Yantra – Venupaka
   Kharpapaka Yantra – Bilvapaka, Karabhapaka etc
   Similarly Hansapaka, ghatayantra and arkapatana yantra find mention in the texts of Gandhashastra, Thus Rasashastra plays an important role in the preparation of Gandhakalpanas.

b) Contribution of Bhaishajya Kalpana to Gandhashastra
   Bhaishajya Kalpana is a science that deals with the samskaras to be done over a bhaishajya. The implementation of these Samskaras in various gandhakalpanas are as follows:
   Toyasanikarsha – Gandhodaka, mukhavasa, jalavasa
   Agnisannikarsha – Gandhatala
   Saucha – Mukhavasa, dhupana samskara
   Kala – Dantakashtha nirmana, bhavana, pachana
   Vasana – Gandhatala nirmana
   Bhavana – Bhavana samskara
   Kalaparakarsha – Kalapaka
   Bhajana – Rajapatra, ayaspatra.
   Manthan – Vedhana Samskara
   Desha – Kashmiraja (Keshara) etc.
   Samshlesha – Mitra-dravyavarga
   Vishlesha – Shatru-dravyavarga.
   The Kashyakalpanas and gandha Kalpanas can be correlated as follows:

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a) Svarasa - Niryasa, syanda, putapaka  
b) Kalka - Dantakashtha  
Churna – Mukhavasa, parijata, uddhulana, pugavasa  
Varti – Dipavarti, dhupararti  
Lepa – Udvantana, Keshavasa, patavasa  
c) Kvatha – Gandhodaka  
d) Hima – Snaniya jalavasa  

Thus Bhaishajya Kalpana has provided a lot of ideas to the Gandhashastra.

2. Pharmaceutical Study :

This study includes a preparation of 4 gandhakalpas by traditional and modern methods.

Ia) Preparation of Priyangvadi Lepa (Complexion Promoting face salve)  
Ingredients:- Priyangu, Keshara, Badar majja, Hribera, Rakta Chanda. (24 %, 2 %, 24 %, 24 %, 26 % respectively).  
Procedure: Each crude drug was finely powdered and sieved with a 80 # mesh. These Powders were then compounded together. Thus Priyangvadi Lepa is prepared.

Ib) Preparation of Priyangvadi Cream :-  

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Ingredients</th>
<th>Wt. in gram</th>
<th>Sr. No.</th>
<th>Ingredients</th>
<th>Wt. in gram</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aq. Extract of Priyangvadi Lepa</td>
<td>25 %</td>
<td>8</td>
<td>Glycerine</td>
<td>11 g</td>
</tr>
<tr>
<td>2</td>
<td>GMS SE</td>
<td>11 g</td>
<td>9</td>
<td>PG</td>
<td>11 g</td>
</tr>
<tr>
<td>3</td>
<td>Ginol</td>
<td>35 g</td>
<td>10</td>
<td>Phenoxy ethanol</td>
<td>2 g</td>
</tr>
<tr>
<td>4</td>
<td>CM 1000</td>
<td>11 g</td>
<td>11</td>
<td>Methyl Paraben</td>
<td>2 g</td>
</tr>
<tr>
<td>5</td>
<td>Brij 72</td>
<td>0.2 g</td>
<td>12</td>
<td>Propyl Paraben</td>
<td>0.3 g</td>
</tr>
<tr>
<td>6</td>
<td>Brij 721</td>
<td>2 g</td>
<td>13</td>
<td>EDTA</td>
<td>0.1 g</td>
</tr>
<tr>
<td>7</td>
<td>IPM</td>
<td>11 g</td>
<td>14</td>
<td>Water</td>
<td>404 ml</td>
</tr>
</tbody>
</table>

Procedure :- All the ingredients of wax phase were added into one vessel and heated to about 75-80° C. Similarly all the ingredients of water phase were added into another vessel and heated to about 75-80° C. At about 75-80° C the wax phase was added into water phase. The mixture was homogenized for 30 min.

II a) Preparation of Kanakadi Lepa (Cosmetics for lips)  
Ingredients :-Ghruta, Phanita, Tilataila, Suvarnagairika, Sarjarasa, Saindhavalavana and Siktha (14.3 % each)  
Procedure. To a hot Tilataila, Siktha was added and then oil was filtered. Into this mixture ghruta & phanita were added Gairika, lavana and sarjarasa powders were further added to this mixture.

II b) Preparation of Kanakadi Lip-stick.  

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Ingredients</th>
<th>Wt. in gram</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bees wax</td>
<td>25 g</td>
</tr>
<tr>
<td>2</td>
<td>Candellila wax</td>
<td>5 g</td>
</tr>
<tr>
<td>3</td>
<td>Seesame oil</td>
<td>25 g</td>
</tr>
<tr>
<td>4</td>
<td>Ghee</td>
<td>20 g</td>
</tr>
<tr>
<td>5</td>
<td>Jaggery</td>
<td>10 g</td>
</tr>
<tr>
<td>6</td>
<td>Suvarnagairika</td>
<td>5 g</td>
</tr>
<tr>
<td>7</td>
<td>Sarjarasa</td>
<td>5 g</td>
</tr>
<tr>
<td>8</td>
<td>Saindhavalavana</td>
<td>5 g</td>
</tr>
</tbody>
</table>

Procedure:- All the ingredients and pigments were melted. The molten mass was transferred to previously lubricated moulds. The lip-sticks were removed after they got solidified.

III a) Preparation of Bilvadi Kakshavasa (Armpit deodorant)  
Ingredients :- Bilva, Haritaki - (50 % each)
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**Procedure** :- Each crude drug was finely powdered and sieved with a 80 # mesh. These powders were then compounded together to get a Bilvadi Kakshavas.

### III b) Preparation of Bilvadi Gel :

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Ingredients</th>
<th>Wt. in gram</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aq. Extract of Bilvadi Kakshavasa</td>
<td>125 g</td>
</tr>
<tr>
<td>2</td>
<td>Carbopol 940</td>
<td>4.5 g</td>
</tr>
<tr>
<td>3</td>
<td>Water</td>
<td>945 ml</td>
</tr>
<tr>
<td>4</td>
<td>Formalin</td>
<td>0.15 g</td>
</tr>
<tr>
<td>5</td>
<td>TEA</td>
<td>0.6 g</td>
</tr>
</tbody>
</table>

**Procedure** : Carbopol was added into small portion of water under constant stirring. The remaining ingredients were also added under constant stirring. TEA was added to attain neutral pH between 6.5 to 7.5. Thus Bilvadi Gel was obtained.

### IVa) Preparation of Alambushadi Taila (Breast size enhances)

**Ingredients** :- Alambusha, Taila, Pippali, Jala (30 g, 250 ml, 30 g, 1 ltr. respectively)

**Procedure** :- A paste of Alambusha and Pippali was processed with Tilataila and jala. After proper 'Siddhilakshana', taila was ready.

### IVb) Preparation of Alambushadi Cream:

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Ingredients</th>
<th>Wt. in gram</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alambushadi Taila</td>
<td>250 g</td>
</tr>
<tr>
<td>2</td>
<td>Ginol</td>
<td>50 g</td>
</tr>
<tr>
<td>3</td>
<td>Cetylalcohol</td>
<td>10 g</td>
</tr>
<tr>
<td>4</td>
<td>Cm 1000</td>
<td>20 g</td>
</tr>
<tr>
<td>5</td>
<td>Stearic Acid</td>
<td>20 g</td>
</tr>
<tr>
<td>6</td>
<td>Carbopol 940</td>
<td>5 g</td>
</tr>
</tbody>
</table>

**Procedure** :- All the ingredients of wax-phase were added to one vessel and that of water-phase into another vessel. These vessels were heated to about 75-80° c. At about 75-80° c, the wax phase was added into the water phase. The mixture was homogenized for 30 minutes. Thus Alambushadi Cream was obtained.

**Analytical Tests**:

<table>
<thead>
<tr>
<th>Analytical Tests</th>
<th>Privayagadi</th>
<th>Kanakadi</th>
<th>Bilvadi</th>
<th>Alambushadi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Violet</td>
<td>Off White</td>
<td>Reddish</td>
<td>Dark Brown</td>
</tr>
<tr>
<td>Odor</td>
<td>Characteristic</td>
<td>Odorless</td>
<td>Odorless</td>
<td>Odorless</td>
</tr>
<tr>
<td>Total Ash</td>
<td>6.80%</td>
<td>-</td>
<td>4.20%</td>
<td>-</td>
</tr>
<tr>
<td>Acid Insoluble Ash</td>
<td>1.90%</td>
<td>-</td>
<td>0.85%</td>
<td>-</td>
</tr>
<tr>
<td>pH</td>
<td>5.83</td>
<td>6.45</td>
<td>5.3</td>
<td>6.98</td>
</tr>
<tr>
<td>Water Soluble Ext</td>
<td>29%</td>
<td>-</td>
<td>27%</td>
<td>-</td>
</tr>
<tr>
<td>Alcohol Sol. Ext</td>
<td>26%</td>
<td>-</td>
<td>19%</td>
<td>-</td>
</tr>
<tr>
<td>LOD at 105° C</td>
<td>6.50%</td>
<td>-</td>
<td>7.7%</td>
<td>-</td>
</tr>
<tr>
<td>Wt/ml</td>
<td>-</td>
<td>10.24</td>
<td>0.902</td>
<td>-</td>
</tr>
<tr>
<td>Particle Size</td>
<td># 80</td>
<td># 80</td>
<td># 80</td>
<td># 80</td>
</tr>
</tbody>
</table>

**Heavy Metals**

<table>
<thead>
<tr>
<th>Bacterial Load (300 cfu/g)</th>
<th>110</th>
<th>210</th>
<th>140</th>
<th>110</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine Value</td>
<td>-</td>
<td>102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saponification Value</td>
<td>89.3</td>
<td>94.7</td>
<td>184</td>
<td></td>
</tr>
<tr>
<td>Refractive Index</td>
<td>1.471</td>
<td>1.481</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acid Value</td>
<td>2</td>
<td>1.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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V. Discussion:

From pre-historic times, India has witnessed the development of the shastras like Jyotisha-Ganita-Paka-Dhatu-Vyakarana-Gandhashastra as well as Ayurveda. These sciences were contemporary to each other. Hence Ayurvedic texts have references from the fields like Jyotisha-Ganita-Paka shastra & Gandhashastra. The Gandhashastra, a science contemporary to ancient Ayurveda, is a co-ordinated, integrated and comprehensive faculty of the orient times.

Various yantras from Rasashastra find description in the texts of Gandhashastra eg. Dola-patana-nalika-patala-khalva-samputa-dhupa-ulukhala-svedani-kharpapaka-hansapaka-ghata-arkapatana yantra. Few changes were noted in the texts of Gandhashastra eg. dolayantra from Rasashastra is an open vessel while that of Gandhashastra is a closed vessel having its mouth luted with clay (to avoid loss of aromatic vapours during dolapaka). Similarly in bhedharayantra, the follow pit is to be filled by Valuika, whereas Gandhasara recommends the clay.

Thus yantras mentioned in Rasashastra have an important role in the preparation of Gandhakalpanas. Various bhashajya samskaras are implemented in the preparation of Gandhakalpanas eg. Toya/Agnisannikarsha, saucha, kala, vasana, bhavana, kalantrprakarsha, bhajana, manthana, desha and yukti.

During application of these samskaras Gandhashastra has made few changes eg. in Gandhashastra, bhavana is done for 5 or 6 times while in Bhaishahya Kalpana it is done for 7 times. Similarly in Gandhashastra vasana, samskara is done to transmit the floral fragrance to the cosmetics while in Bhaishajya Kalpana, it is done for transmission of scents to the cosmetic as well as non-cosmetics eg. Asava & Arishta.

Although 895 Gandhakalpas have been described in the ancient texts the present paper has dealt with 4 gandhakalpas prepared by traditional and modern methods.

VI. Conclusion:

At one time in the history of humanity, Gandhashastra was perhaps the most predominant science of life. Even the ancient Royal families were enjoying the essence of Gandhashastra. Hence the importance of studying a contemporary science to ancient Ayurveda, like Gandhashastra cannot be ruled out.

The experimentation was carried for representative four products, which were then tested for the necessary laboratory findings. From these studies it can be said that Gandhashastra has utilized the basic principles of Rasashastra and Bhaishajya Kalpana, for preparing the Gandhakalpanas.

Such a multi-disciplinary work may provide useful information to the cosmetics industry of the 21st Century.

References

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