The Effect Of Bhavna And Application Of Panchabhautik Effect On Triphaladi Yoga

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ABSTRACT

Triphalaadi yoga is a combination of eleven dried herbs i.e. Haritaki, Bibhitaki, Amalaki, Yastimadhu, Gokshura, Guduchi, Haridra, Daruharidra, Shunthi, Tulsi and Punarnava in powder form which is administered as a rasayana therapy in patients of CVS. These eleven drugs chosen for this study is an Anubhoota yoga from the Shalakya Tantra Department of I.P.G.T& R.A, Jamnagar and has the solid backing of previous researches for their most important individual activities. The body is made up of Panchamahabhuta so the plants from which Ayurvedic drugs are extracted. In the present study author try to evaluate how the composition of Panchamahabhuta changes before and after the Bhavna of the drug with the help of the pharmacognostical parameters like acicular crystals of Punarnava which are rarely found after the Bhavna of the drug and also evaluate the differences in the pharmaceutical profile before and after Bhavna like loss on drying, ash value, acid insoluble ash, water soluble extract, methanol soluble extract, pH and HPTLC.

Keywords: CVS, Pharmacognosy, Panchamahabhuta, Triphaladi yoga.

INTRODUCTION

Computer has become common in today society and is causing some serious health hazards, among which Computer Vision Syndrome (CVS) is one. CVS is defined as a complex of ocular or visual problems which are experienced during and related to computer use. Computers are now an integral part of our day. This advancement of science has brought about a vast change in our lives that we wonder what life would have been without it. With all its benefits come certain health related issues, awareness of which is minimal. One of the bi-products - CVS. It is a complex of eye and vision problems related to near work which are experienced during computer use¹. The symptoms of CVS are related to Vata-pitta pradhana Tri-dosa vitiation at Chakshurendriya leading to the Sthanasamshraya (lodged) in Netra (eyes).

It includes Dushya – Rasa, Rakta, Mamsa, Medha, Srotas – Rasavaha Srotas, Srotodrusti Prakara – Sanga². Triphalaadi yoga is a combination of eleven dried herbs i.e. Haritaki, Bibhitaki, Amalaki, Yastimadhu,
Gokshura, Guduchi, Haridra, Daruharidra, Shunthi, Tulsi and Punarnava in powder form which is administered as a Rasayana therapy in patients of CVS. Bhavana (trituration) is an important Samskara (process) mentioned in classics by which even a small dose of a drug may be made very potent to produce a very high result. Triphaladi yoga is a combination of above 11 dried herbs which was triturated seven times with decoction of the same compound and made into dried powder. It leads to particle size reduction of molecules by repeated movement and pressure of pestle. Bhavana with organic juices improves the bioavailability of the drugs thereby enhances their rate of absorption\(^2\). There is also change in the Panchabhautik composition of individual drugs after Bhavana which helps to break the etiopathogenesis of disease. Triphaladi yoga consist of Rasayana drugs which have already proven activities like adaptogenic properties of Guduchi, Haritaki, Amalaki\(^4\) anti cataract activity of Haritaki, Amalaki, Bibhitaki (Triphala)\(^5\), anti advanced glycated end products activity of Shunti\(^6\), antioxidants activity of Haridra, Amalaki, Yashtimadhu, Tulsi, Bibhitaki, Guduchi, Shunthi\(^7\), adaptogenic, immunomodulatory and anti inflammatory properties of Punarnava\(^8\), immunomodulatory and anti inflammatory properties of Gokshura\(^9\), adaptogenic, anti inflammatory, anti cataract effect of Haridra\(^10\) and anti inflammatory activity of Daruharida\(^11\).

MATERIALS AND METHODS

Collection of the drug

Ingredients of Triphaladi compound viz. fruits of Haritaki (Terminalia chebula Retz), Bibhitaki (Terminalia bellerica Roxb), Amalaki (Emblica officinalis Gaertn), roots and rhizomes of Yastimadhu (Glycyrriza glabra Linn), fruits of Gokshura (Tribulus terrestris Linn), stem of Guduchi (Tinospora cordifolia Meirs), rhizome of Haridra (Curcuma longa Linn), Daruharidra (Berberis aristata DC), Rhizome of Shunthi (Zingiber officinale Rosc), whole plant of Punarnava (Boerhavia diffusa Linn) were procured from the institutional pharmacy and leaves of Tulasi (Ocimum sanctum Linn) were collected from local area of Jamnagar, India. (Table 1)

Their characteristics were confirmed by correlating their morphological and microscopical features with relevant literature.

Preparation of the drug

Equal quantities of the obtained fruits, stems, roots/rhizomes, leaves, whole plant were shade dried and made into fine powder separately with the help of mechanical grinder, sieved through 85# and mixed together mechanically to get homogenous mixture.

Preparation of Triphaladi yoga with seven Bhavana

The prepared powder of Triphaladi yoga was triturated with decoction of the same compound seven times in end runner. In each Bhavana sufficient amount of decoction made from Triphaladi yoga was added to the powder of Triphaladi yoga as it is very well soaked and then triturated for 6-8 hours daily till the Bhavana...
given to the powder was completely absorbed. On completing the seventh Bhavana, the obtained powder was dried and filtered through 120# sieve mesh.

**Pharmacognostical evaluation organoleptic evaluation**

Various characters like colour, odour, taste and touch are recorded by using sensory organs. Powder microscopy of the finished product was done without stain and after staining with Phloroglucinol+HCl. Micro photographs were taken under Carl- Zeiss Trinocular microscope attached with camera. By Powder microscopy observed the characters, determined the chemical nature of the cell wall along with the form and chemical nature of the content of the cells.

**Physicochemical analysis**

In physicochemical analysis loss on drying, ash value, water soluble extract, alcohol soluble extract etc. were assessed. Preliminary tests were carried out on methanolic extract of test drugs for the presence or absence of phytoconstituents like alkaloids, tannin and phenolic compounds, flavonoids, saponin and anthraquinone glycosides.

**High performance thin layer chromatography (HPTLC)**

HPTLC was performed as per the guideline provided by API. Methanolic extract of drug sample was used for the spotting. HPTLC was performed using Toluene+ Ethyl acetate+ Formic acid (6:3:1) solvent system and observed under visible light. The colour and Rf values of resolved spots were noted.

**OBSERVATION RESULTS**

**Pharmacognostical evaluation organoleptic evaluation**

Results of various parameters such as colour, odour, taste, touch and texture of the finished products (powder) are shown in Table 2, Plate A.

**Powder microscopy without Bhavana:**

Scleroids of Amalaki, silica deposition of Amalaki, simple starch grains of Shunthi, fibres of Shunthi, acicular crystal of Punarnava, cork cells of Punarnava, trichome of tulsi, oil globule of Tulsi, stone cells of Daruharidra, scleroids of Daruharidra, fibres of Daruharidra, yellow content of Haridra, scalariform vessels of Haridra, border pitted vessel of Guduchi, sclerenchyma tissue of Guduchi, rhomboidal crystal of Yashtimadhu, crystal fibre of Yashtimadhu, pitted vessels of Yashtimadhu, stone cells of Haritaki, tannin content of Haritaki, trichome of Gokshura, stratified fibres of Gokshura, scleroids of Vibhataki, trachome of Vibhataki. Lignified scleroid of Vibhataki, lignified scleroid of Yashtimadhu, lignified stone cells of Gokshura, lignified crystal fibres of Yashtimadhu, lignified stratified fibres of Gokshura, lignified scleroid with cork of Guduchi. Plate B(1-30)

**Powder microscopy with Seven Bhavana:**

Diagnostic powder characteristics of with 7 Bhavana are disturbed scalariform vessels of Haridra, parenchyma cells of Haridra become light yellow colour, oil globule of Tulsi stretched and open, scleroids
of Daruharidra with disturbed walls, stone cells with wide lumen of Daruharidra, disturbed pitted vessels of Daruharidra, walls of stone cells of Yashtimadhu become smooth and formed the lumen, crystals are not found in the fibres of Yashtimadhu, crystals of Yashtimadhu are rarely observed, group of pitted scleroids with wide lumen of Vibhataki, smooth walled trachome of Vibhataki, pitted stone cells of Vibhataki with wide lumen and disturbed walls, rarely found acicular crystals of Punarnava, trichome of Gokshura, disturbed stratified fibres of Gokshura, starch grains of Shunthi, stone cells of Haritaki with yellow content with more constriction, disturbed sclerenchyma cells of Guduchi, disturbed cork cells of Guduchi, border pitted vessels of Guduchi completely disturbed, silica deposition of Amlaki, group of scleroids of Amlaki. Lignified stone cells of Yashtimadhu, lignified scleroids of Daruharidra, lignified stratified fibres of Gokshura, lignified scleroids of Vibhataki, lignified scleroids of Haritaki, lignified border pitted vessel of Guduchi. Plate C(1-27)

**Physicochemical analysis:**

Results of physicochemical analysis ie. loss on drying, ash value, water soluble extract, alcohol soluble extract, ash value etc are shown in Table 3.

**High performance thin layer chromatography (HPTLC):**

The colour and R<sub>f</sub> values of resolved spots of HPTLC were noted. (Table-4) (Plate no. D)

### Table 1: Ingredients of *Triphaladi yoga*:

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of ingredients</th>
<th>Botanical name</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Haritaki</td>
<td>Terminalia chebula Retz</td>
<td>1 part</td>
</tr>
<tr>
<td>2</td>
<td>Bibhitaki</td>
<td>Terminalia bellerica Roxb</td>
<td>1 part</td>
</tr>
<tr>
<td>3</td>
<td>Amalaki</td>
<td>Emblica officinalis Gaertn</td>
<td>1 part</td>
</tr>
<tr>
<td>4</td>
<td>Yashtimadhu</td>
<td>Glycyrriza glabra Linn</td>
<td>1 part</td>
</tr>
<tr>
<td>5</td>
<td>Gokshura</td>
<td>Tribulus terrestris Linn</td>
<td>1 part</td>
</tr>
<tr>
<td>6</td>
<td>Guduchi</td>
<td>Tinospora cordifolia Meirs</td>
<td>1 part</td>
</tr>
<tr>
<td>7</td>
<td>Haridra</td>
<td>Curcuma longa Linn</td>
<td>1 part</td>
</tr>
<tr>
<td>8</td>
<td>Daruharidra</td>
<td>Berberis aristata DC</td>
<td>1 part</td>
</tr>
<tr>
<td>9</td>
<td>Shunthi</td>
<td>Zingiber officinale Rosc</td>
<td>1 part</td>
</tr>
<tr>
<td>10</td>
<td>Punarnava</td>
<td>Boerhavia diffusa Linn</td>
<td>1 part</td>
</tr>
<tr>
<td>11</td>
<td>Tulasi</td>
<td>Ocimum sanctum Linn</td>
<td>1 part</td>
</tr>
</tbody>
</table>

### Table 2: Organoleptic characters of *Triphaladi yoga*:

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Various parameters</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>Triphaladi yoga</em> without seven Bhavana</td>
<td><em>Triphaladi yoga</em> powder with seven Bhavana</td>
</tr>
<tr>
<td>1.</td>
<td>Colour</td>
<td>Yellowish brown</td>
</tr>
<tr>
<td>2.</td>
<td>Odour</td>
<td>Irritative</td>
</tr>
<tr>
<td>3.</td>
<td>Taste</td>
<td>Sweetish followed by astringent</td>
</tr>
<tr>
<td>4.</td>
<td>Touch</td>
<td>Fine coarse</td>
</tr>
<tr>
<td>5.</td>
<td>Texture</td>
<td>Soft</td>
</tr>
</tbody>
</table>
Table 3: Physico-chemical parameters:

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Various parameters</th>
<th>Results</th>
<th>Triphaladi yoga without seven Bhavana</th>
<th>Triphaladi yoga powder with seven Bhavana</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>pH</td>
<td></td>
<td>5.0</td>
<td>6.0</td>
</tr>
<tr>
<td>2.</td>
<td>Loss on drying</td>
<td></td>
<td>7.95%</td>
<td>6.8%</td>
</tr>
<tr>
<td>3.</td>
<td>Ash value</td>
<td></td>
<td>7.65%</td>
<td>4.05%</td>
</tr>
<tr>
<td>4.</td>
<td>Acid insoluble ash</td>
<td></td>
<td>0.4%</td>
<td>1%</td>
</tr>
<tr>
<td>5.</td>
<td>Water soluble extractive value</td>
<td></td>
<td>24.3%</td>
<td>21.2%</td>
</tr>
<tr>
<td>6.</td>
<td>Methanol soluble extractive value</td>
<td></td>
<td>21.4%</td>
<td>15.9%</td>
</tr>
</tbody>
</table>

HIGH PERFORMANCE THIN LAYER CHROMATOGRAPHY (HPTLC)

Table 4: Rf values obtained by HPTLC

<table>
<thead>
<tr>
<th>Sample</th>
<th>Visualize under short UV (254 nm)</th>
<th>Visualize under short UV (366 nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of spots</td>
<td>Rf value</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triphaladi yoga powder with seven Bhavana</td>
<td>6</td>
<td>0.03, 0.17, 0.23, 0.43, 0.56, 0.72</td>
</tr>
<tr>
<td>Triphaladi yoga without seven Bhavana</td>
<td>9</td>
<td>0.03, 0.07, 0.15, 0.23, 0.31, 0.37, 0.54, 0.69, 0.77</td>
</tr>
</tbody>
</table>

Plate A  TRIPHALADI YOGA POWDER

With Bhavna  Without Bhavna

Plate B Powder characters without Bhavna:
1. Scleroids of Amalaki

2. Silica deposition of Amalaki

3. Simple starch grains of Shunthi

4. Fibres of Shunthi

5. Acicular crystal of Punarnava

6. Cork cells of Punarnava

7. Trichome of Tulsi

8. Oil globule of Tulsi

9. Stone cells of Daruharidra

10. Scalariform vessels of Haridra

11. Fibres of Daruharidra

12. Yellow content of Haridra
<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Scleroids of Daruharidra</td>
</tr>
<tr>
<td>14</td>
<td>Border pitted vessels of Guduchi</td>
</tr>
<tr>
<td>15</td>
<td>Sclerenchyma cells of Guduchi</td>
</tr>
<tr>
<td>16</td>
<td>Rhomboidal crystal of Yashtimadhu</td>
</tr>
<tr>
<td>17</td>
<td>Crystal fibre of Yashtimadhu</td>
</tr>
<tr>
<td>18</td>
<td>Pitted vessels of Yashtimadhu</td>
</tr>
<tr>
<td>19</td>
<td>Stone cells of Haritaki</td>
</tr>
<tr>
<td>20</td>
<td>Tannin content of haritaki</td>
</tr>
<tr>
<td>21</td>
<td>Trichome of Gokshura</td>
</tr>
<tr>
<td>22</td>
<td>Stratified fibres of Gokshura</td>
</tr>
<tr>
<td>23</td>
<td>Scleroids of Vibhataki</td>
</tr>
<tr>
<td>24</td>
<td>Trichome of Vibhataki</td>
</tr>
</tbody>
</table>
25. Lignified scleroid of Vibhataki
26. Lignified scleroid of Yashtimadhu
27. Lignified pitted vessels of Yashtimadhu
28. Lignified stone cells of Gokshura
29. Lignified stratified fibre of Gokshura
30. Lignified sclerenchyma cells of Guduchi

Plate C Powder characters with Bhavna:

1. Disturbed scalariform vessels of Haridra
2. Parenchyma cells of Haridra become light yellow in colour
3. Oil globule of Tulsi stretched and open
4. Scleroid of Daruharidra with
5. Stone cells with wide lumen of
6. Disturbed pitted vessels of
disturbed walls

7. Stone cells of Yashtimadhu-wall become smooth and formed the lumen

8. Crystals are not found in the fibres of Yashtimadhu

9. Group of scleroids with wide lumen of Vibhataki

10. Smooth walled trichome of Vibhataki

11. Pitted stone cells of Vibhataki with disturbed walls

12. Trichome of Gokshura

13. Disturbed stratified fibres of Gokshura

14. Rarely observed acicular crystals of Punarnava

15. Starch grains of Shunthi

16. Stone cells of Haritaki with yellow content with more

17. Disturbed sclerenchyma cells of Guduchi

18. Disturbed cork cells of
Plate D HPTLC of methanolic extract of *Triphaladi yoga* compound

20. Silica deposition of Amalaki
21. Group of scleroids of Amalaki
22. Lignified stone cells of Yashtimadhu
23. Lignified scleroids of Daruharidra
24. Lignified stratified fibres of Gokshura
25. Lignified scleroids of Vibhataki
26. Lignified scleroids of Haritaki
27. Lignified border pitted vessel of Guduchi

Densitogram at 254nm without bhavna

Densitogram at 254nm with bhavna
DISCUSSION:

There was a slight color and taste variation between *Triphaladi yoga* without *Bhavana* and with *Bhavana*. The colour of *Triphaladi yoga* without *Bhavana* was golden yellow while the same of *Triphaladi yoga* with seven *Bhavana* was dark greenish. The colour change owes to prolong trituration of the compound. As it is well-known that during trituration, mild heat is generated due to friction which darkens the grinding matter. *Triphaladi yoga* with seven *Bhavana* possesses Kashaya (astringent), Madhura (sweet) and Tikta (bitter) Rasa (taste). Bitter taste is increased and sweet taste is also noted in *Triphaladi yoga* with seven *Bhavana* in comparison to *Triphaladi yoga* without *Bhavana*. The alteration in Rasa is might be due to the effect of elimination process carried out during *Bhavana Samskara* of the drugs. The more water soluble components like that of *Yastimadhu* are increased in the compound by seven times trituration which is also responsible for the sweet taste. Touch and texture of the *Triphaladi yoga* with seven *Bhavana* are very fine and soft compared to *Triphaladi yoga* without *Bhavana* might be due to breakdown of the hard cellular structures and the exposed cellular contents by prolonged trituration of the drugs. Disturbed scalariform vessels of *Haridra*, oil globule of *Tulsi* stretched and open, scleroids of *Daruharidra* with disturbed walls, stone cells with wide lumen of *Daruharidra*, disturbed pitted vessels of *Daruharidra*, walls of stone cells of *Yashtimadhu* become smooth and formed the lumen, crystals are not found in the fibres of *Yashtimadhu*, group of pitted scleroids with wide lumen of *Vibhataki*, smooth walled trachome of *Vibhataki*, pitted stone cells of *Vibhataki* with wide lumen and disturbed walls, rarely found acinar crystals of *Punarnava*, disturbed stratified fibres of *Gokshura*, stone cells of *Haritaki* with yellow content with more constriction, disturbed sclerenchyma cells of *Guduchi*, disturbed cork cells of *Guduchi*, border pitted vessels of *Guduchi* completely disturbed, The main interaction of *Panchamahabhutha* are Pitted stone cells with wide lumen, fibers with wide lumen indicates that characters may be influenced by Vayu and Akash. The specific cells and characters were loosely arranged with the influence may be Jala. The clumping and dissolving nature of...
acicular crystals because of addition of Amalaki indicating influence of Agni ultimately integrate the potency of the formulation. All these changes in the powder after Bhavna indicate the increase of Vayu and Akash Mahabhuta in the drug, diminished crystals indicate decrease in the Prithvi mahabhuta, presence of fibres indicates of Jala mahabhuta. As we know the CVS is due to Sanga of Doshas in the Srotas, Vayu, Akash mahabhuta helps to remove the Avrodha of Srotas and clear the pathway for the Dhatu to reach their respective places. Jala mahabhuta increase the Rasdhatu in the eye which is needed for proper nourishment of eye and tear secretion. Destroyed crystals help in the decrease of irritation produced in the eye.

A considerable difference was found in the values of some of the physicochemical parameters of Triphaladi yoga with seven Bhavana. There was not much difference found in the values of pH, Loss on drying and ash value. After Bhavna, water soluble extract and methanol soluble extract values were found to be decreased. The surface area of particles increased after titurition and molecular distribution is large after Bhavna and thus absorption is increased. In HPTLC profile of the methanolic extract of the drug 6 spots at Rf 0.03, 0.17, 0.23, 0.43, 0.56, 0.72 were observed in 254nm UV light spectrum while 10 spots at Rf 0.03, 0.08, 0.17, 0.23, 0.29, 0.43, 0.50, 0.56, 0.71, 0.87 were observed in 366nm UV light spectrum. The explanation behind this may be due to seven times titurition the particles become fine and distribution become large so the less number of peaks were found after Bhavna.

CONCLUSION:

While preparation of Triphaladi yoga with and without Bhavna pharmagnostical evaluation proved without presence of all the ingredients in Yoga showed that genuinity of the finished product. The physiochemical aspects of some characters show variation due to the Bhavna effect. The generated results will be taken into consideration for further research work.

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