



## THERAPEUTIC POTENTIAL OF BHANGA IN KASHTARTAVA: A LITERATURE REVIEW

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## ABSTRACT

*Kashtartava* (Dysmenorrhea) is a prevalent co-morbidity in women. The name "*Kashtartava*" might be inferred as the condition in which *Artava* sheds pain, which can be associated with Dysmenorrhea. Around the world, 50-90% of women in their reproductive years report having painful periods, a disorder known as Dysmenorrhea. In this review article, we delved into the traditional uses, pharmacological properties and challenges associated with using *Bhanga* (*Cannabis sativa* Linn) for managing *Kashtartava* and its related effects. Research expedition sheds light on the potential therapeutic benefits, mainly focusing on its active component, tetrahydrocannabinol (THC), which exhibits analgesic, anti-inflammatory, antiemetic, and neuroprotective properties. This review highlights the challenges in conducting rigorous research on using the herb during menstruation and pregnancy, owing to study design limitations and confounding variables. This legal ambiguity underscores the importance of understanding and addressing the cultural and legal context surrounding its use in contemporary healthcare practices.

Moreover, the psychoactive nature of THC raises concerns regarding its impact on mood and cognition, warranting cautious consideration in clinical applications.

**Keywords:** *Kashtartava*, *Bhanga*, Pain, Tetrahydrocannabinol, *Trilokya vijaya vati*.

## INTRODUCTION

In the world, 50–90% of women in their reproductive years report experiencing painful periods, a condition known as Dysmenorrhea.<sup>1</sup> Between 2% and 29% of the women in the research reported having significant discomfort, while the prevalence of it among women of reproductive age ranged from 16% to 91%.<sup>2</sup>

It was discovered that women's age, parity, and use of oral contraceptives were negatively connected with the risk of experiencing *Kashtārtava* and that high levels of stress increased that likelihood. Menstrual cramps, painful periods, or period pain are several names for Dysmenorrhea; It typically begins at the onset of the menstrual cycle.

It is a disorder often resulting in prolonged discomfort, loss of economic activity, and low self-esteem, especially in young females. This is true even with extended or increased usage of allopathic therapies in secondary Dysmenorrhea, which eventually requires surgical intervention<sup>3</sup> so, it need of the hour that there will be potent herbal medicine which immediately subsides pain of Dysmenorrhea and also relieves oth-

er symptoms associated with it. In classical text, there are many diseases of *Artavvaha Strotas* (channels which carry menstrual blood) in which *KukshiShool* (Abdominal pain) is the chief cardinal feature. Many pain-relieving formulations are mentioned in Ayurvedic texts, such as *Trilokya Vijaya Vati*, *Sinduradi vati*, *Vajrakapat rasa* and many more (Table 1). Uses of *Vijaya* (Bhanga), as a drug, gradually increased during the medieval period. *Sangraha Granthas* (Different pharmacopoeia) reports about 191 formulations of 13 different dosage form having *Vijaya* as an ingredient. It is used both internally (187 formulations) as well as externally (4 formulations). Among these 111 *Rasa Ausadhi* (Herbo- mineral-metallic preparations), 30 *Gutika* (Tablet), 17 *Churna* (Powder); 09 *Avaleha* (Confectionaries); 4 *Asva* (self-generated alcoholic preparations) and *Tail* (oil preparations); 03 *Kwatha* (Decoction) and *Ghrita* preparations and one each in *Arishta* (Alcoholic preparations), *Modaka* (Bolus) preparation, *Sattva* (Essence), *Lauha* (Iron base preparation)<sup>4</sup> are explained.

**Table 1: Bhanga Containing Formulations**

| S.no | Formulation                                       | References  |
|------|---|---|
| 1.   | <i>Bhaishajya Ratnavali</i>                       | <i>Ajeernari Rasa</i> 10/235-238<br><i>Grahanigajendra Vatika</i> 8/278-280<br><i>Vajrakapata Rasa</i> 8/289-291<br><i>Kamini vidravan Ras</i> 75/19-21<br><i>Bahumutrantak Rasa</i> 86/35-38<br><i>Pushpadhanva Rasa</i> 74/70<br><i>Maha Jwarankush Rasa</i> 5/591-593<br><i>Kameswara modaka</i> 8/194-197<br><i>Madnanand Modak</i> 8/162-170 |
| 2.   | <i>Ras Prakash Sudhakar</i>                       | <i>Karpursundari Vati</i> 8/35-37<br><i>Viryastambhakarivati</i> 13/1-4   |
| 3.   | <i>Dhanwantari</i><br><i>Nighantu(vajikarana)</i> | <i>Sinduradi Vati</i>   |
| 4.   | <i>Rasa Tarangini</i>                             | <i>Trilokya Vijaya Vati</i> (24/427-430)  |

|    |                      |  |
|----|----------------------|--|
| 5. | Ras Raja Sundar      | Kamadeva Rasa(Rasayanadhikaran 548)<br>Karpuradyo Rasa (Jwaratisaradhikar)<br>Sompani Rasa (Kaphajwaradhikara 267) |
| 6. | Rasa yoga sagara     | Nidrodya Rasa -448   |
| 7. | RasendraSaarsangraha | NaradiyalakshmivilasRasaRasayanvajikaranadhikar 20-33)   |
| 8. | Bhava Prakash        | Vijaya lehya Madhyam Khand 2/147   |

Table 1 formulations, all are orally administered drugs based on the therapeutic dose of *Bhanga*. The medicine has a direct effect on 'Vata Vaahini Naadi'(motor neurons) and therefore providing quick relief, or the 'Aashukari' effect and provides quick results in the ailments related to various types of pain as mentioned in the classical text *Rasa Tarangini* (24/427-430)<sup>5</sup> in reference to *Trilokya vijaya vati*.

In classical texts , various herbs and plants are utilized to alleviate the symptoms of *Kashtārtava*. This review article aims to explore the potential use of *Bhanga* (cannabis) which is the main content of many traditional medicines for managing *Kashtārtava* (Dysmenorrhea) and its associated effects.<sup>6</sup>

#### Description of Bhanga:<sup>7</sup>

*Bhanga* has also been mentioned in different classical texts.

**Table no. 2: Bhanga mentioned in classical texts.**<sup>8-13</sup>

| S.no | Reference text         | Interpretation   |
|------|------------------------|--|
| 1    | <i>Susruta Samhita</i> | mentions <i>Bhanga</i> as <i>Vijaya</i> <sup>8</sup> under <i>Mula Visha</i> (root poison)                                   |
| 2    | <i>Charak Samhita</i>  | recommends using an infusion of its leaves as an external remedy to wipe away <i>Sushka Arsha</i> (dry piles) <sup>9</sup> . |
| 3    | <i>Chakrapaani</i>     | In <i>Kushtchikitsaadhayay Bhanga</i> as <i>Indrashana</i> <sup>10</sup> .   |
| 4    | <i>Bhavpraksh</i>      | defines <i>Bhanga</i> <sup>11</sup> in the <i>Haritkyadivarga</i> .  |
| 5    | <i>Priyavat Sharma</i> | <i>Bhanga</i> as <i>madkari</i> <sup>12</sup> .  |
| 6    | <i>Sharangdhar</i>     | Mentioned <i>Bhanga</i> in <i>Vyavai Dravya</i> <sup>13</sup> .  |

There are over 40 synonyms given to *Bhanga* in various classical texts (Table 3).

**Table 3: Synonyms attributed to Bhanga**<sup>14-24]</sup>

| S.no | Characteristics                       | Synonyms  |
|------|---------------------------------------|---|
| 1    | Based on mythological origin          | <i>Sivamoli, Sarkrasana, Siddhi, Siddhamuuli, Siddhida, Trailokya Vijaya, Bhangi, Vijaya, Divya, Kalaghni, Bhangika, Bhangaja, Pasupasavinasini, Indrasana,</i>     |
| 2    | Based on Pharmacognostical characters | <i>Matulani, Matuli, Mohi, Samvida manjari, Bhrungi,</i>  |
| 3    | Based on Pharmacological actions      | <i>Bahuvadini, Ganja, Ananda, chhidalhada, Harsani, Madini, Mohini, Maadu, Ranjika, Tandrakrta, Manonmana, Matika, Mohini, Jaya Bhangand, Bhangaja, Matkunakari</i> |

#### Shodhana (Purification) of Bhanga (Cannabis)

The *Shodhana* method involves both reduction and oxidation in the amounts of harmful components, which can result in improved therapeutic efficacy. *Shodhana* in the classical text refers not only to purifying/detoxifying impurities but also to minimizing adverse effects and boosting the potency/therapeutic

efficacy.<sup>25</sup> *Shodhana* is a process specifically designed to eliminate impurities from a substance. This multifaceted process involves various techniques such as *Kshalana* (washing), *Mardana* (pounding), *Bhavana* (levigation), *Swedana* (boiling), *Bharjana* (frying), *Nirvapa* (heating and dipping in specified liquids), and more. These methods are employed on drugs to ensure thorough purification, thus enhancing

the quality and efficacy of the final product. It is indeed a detoxification process aimed at eliminating physical and chemical blemishes as well as toxic materials from a substance. By undergoing *Shodhana*, the material becomes purified and devoid of impurities, rendering it suitable for further processing and utilization in various applications. This process enhances the drug's overall quality and suitability for its intended purposes.<sup>26</sup>

The process of *Shodhana*, or purifying of *vishadra-vya*, is also crucial to the usefulness of these drugs for medicinal purposes.<sup>27</sup> Thus, it is crucial to comprehend the *Shodhana* (purification) procedure described in classical literature. so, there are some *Shodhana* methods for *Bhanga*, which are described in different classical texts.(Table 4)

**Table 4: Shodhana of Bhanga In Classical Text**<sup>28-30</sup>

| S.no | Shodhana Dravya                                 | Shodhana Procedure   | Reference Text                                       |
|------|---|--|--|
| 1    | Goghrita (clarified butter), Water              | After soaking in water, the leaves are tied in a cloth. This process needs to be carried out repeatedly until the leaves' discharge of greenish colors ends. The leaves are then fried in <i>goghrita</i> .  | Rasa Tarangini 24/394-395                            |
| 2    | Cow's milk ( <i>godugdha</i> ), <i>Goghrita</i> | Involves fomenting (boiling) in cow's milk ( <i>godugdha</i> ) for three hours then washed with water. After getting it dried, it is being roasted in <i>Goghrita</i> .  | Rasa-Jala-Nidhi, vol.3, 8 <sup>th</sup> chap. Pg.350 |
| 3    | <i>BabbulTvak</i> , <i>Godugdha</i>             | After a 25–30 minute fomentation period in a decoction of <i>BabbulTvak</i> (the bark of <i>Acacia catechu</i> ) at a moderate heat, the <i>Bhanga</i> leaves are to be dried in the sun. Further they are triturated with <i>Godugdha</i> (cow's milk), dried and used. | Rasa Tarangini 24/396-397                            |

**Table no: 5 Pharmacological properties attributed to Bhanga in different Nighantus**

| Nighantu/Rasagrantha  | Rasa (Taste)          | Guna                                  | Virya (Potency)    | Vipaka | Karma                                  | Doshagnata                    |
|---|-----------------------|---------------------------------------|--------------------|--------|--|-------------------------------|
| <i>Dhanvantari Nighantu</i> <sup>31</sup> ( <i>Guduchyadi Varga</i> ) | <i>Tikta</i> (Bitter) | <i>Laghu</i> (Light)<br><i>Tiksna</i> | <i>Ushna</i> (Hot) | -      | <i>Grahi, Pachana</i>                  | <i>Kaphahara, Pittala</i>     |
| <i>Sodhala Nighantu</i> <sup>32</sup> ( <i>Lakshmanadi Varga</i> )    | -                     | -                                     | <i>Ushna</i> (Hot) | -      | <i>Depana, Grahi, Pachana</i>          | <i>Kaphavatahara, Pittala</i> |
| <i>Sharangadhara Samhita</i> <sup>33</sup>                            | -                     | -                                     | -                  | -      | <i>Vyavayi</i>                         | -                             |
| <i>Madanapala Nighantu</i> <sup>34</sup> ( <i>Haritakyadi Varga</i> ) | <i>Tikta</i> (Bitter) | <i>Laghu</i> (Light)<br><i>Tiksna</i> | <i>Ushna</i> (Hot) | -      | <i>Grahi, Depana</i>                   | <i>Kaphahara, Pittala</i>     |
| <i>Kaiyadeva Nighantu</i> <sup>34</sup> ( <i>Aushadhi Varga</i> )     | <i>Tikta</i> (Bitter) | <i>Laghu</i> (Light)<br><i>Tiksna</i> | <i>Ushna</i> (Hot) | -      | <i>Grahi, Depana, Ruchya, Madakari</i> | <i>Kaphavatahara, Pittala</i> |
| <i>Bhavaprakasha</i> <sup>35</sup> ( <i>Haritakyadi Varga</i> )       | <i>Tikta</i> (Bitter) | <i>Laghu</i> (Light)<br><i>Tiksna</i> | <i>Ushna</i> (Hot) | -      | <i>Grahi, Pachana</i>                  | <i>Kaphahara, Pittala</i>     |
| <i>Siddhabhaisajiya Manimala</i> <sup>36</sup>                        | -                     | <i>Laghu</i> (Light)                  | -                  | -      | -                                      | <i>Kaphahara</i>              |
| <i>Saligrama Nighantu</i> <sup>37</sup> ( <i>Ash-</i>                 | -                     | <i>Tiksna</i>                         | -                  | -      | <i>Medhya, Ra-</i>                     | <i>Kaphavatahara</i>          |

|   |                   |                  |                |                   |                                       |         |
|---|-------------------|------------------|----------------|-------------------|---------------------------------------|---------|
| tavarga)  |                   | Laghu<br>(Light) |                |                   | sayana,<br>Depana Gra-<br>hi, Pachana |         |
| Pirya Nighantu <sup>38</sup> (Sa-<br>tapuspadi Varga) | Tikta<br>(Bitter) | -                | Ushna<br>(Hot) | Katu<br>(Pungent) | -                                     | Pittala |

### Chemical Composition of Bhanga-

#### Active principle-

It is not an alkaloid (Cannabinol) but a fat-soluble oleoresin, Cannabinol, the active form of which is  $\delta$ -9—tetrahydrocannabinol (THC). About 426 chemical entities total—more than 60 cannabinoid compounds—are found in this plant.<sup>39</sup> The four main components studied the most are cannabinol, d-9-THC (tetrahydrocannabinol), CBD (cannabidiol), and d-8-THC.<sup>40</sup>

**Cannabinol-** A cannabinoid isolated from the plant Cannabis that is a metabolite of tetrahydrocannabinol (THC), with potential immunosuppressive and anti-inflammatory activities. Cannabinol preferentially binds to the cannabinoid G-protein coupled receptor CB2, mainly expressed in various immune cells, such as T cells, B cells, macrophages and dendritic cells. Stimulation of CB2 receptors by cannabinol may trigger apoptosis in these cells and inhibit the production of various cytokines. Cannabinol exerts minimal affinity for CB1 and has a weak effect on the central nervous system.<sup>41</sup>

**Tetrahydrocannabinol** is an isomer of tetrahydrocannabinol (THC), the primary and most active isomer found in the cannabis sativa L. plant, with potential analgesic, anti-emetic and appetite-stimulating activities. Upon administration, dronabinol, also

called delta-9-THC, targets and binds to cannabinoid receptors (CBRs) located in the central nervous system (CNS). Dronabinol acts directly on the brain's pain and vomiting control centres to induce analgesia<sup>42</sup> and prevent emesis.

#### Cannabidiol

A Phyto cannabinoid derived from Cannabis species, which is devoid of psychoactive activity, with analgesic, anti-inflammatory, antineoplastic and chemopreventive activities. Upon administration, cannabidiol (CBD) exerts its anti-proliferative, anti-angiogenic and pro-apoptotic activity through various mechanisms.<sup>43</sup>

#### Bhanga in Kashtartava-

Kashtartava is not mainly addressed in classical scriptures despite the fact that menstruation often causes discomfort. This is a symptom of *Yonivyapadas* (Uterine disorder), including *Udavarta*, *Vatala*, and *Sannipatika*. According to *Acharya Charak*, *Yoniroga* cannot exist without a vitiated *Vata*. As *Vata* is the primary cause and should be addressed first.<sup>44</sup> According to classical text, pain is an indication of *Vata Vikriti*.<sup>45</sup>

Therefore, *Bhanga* has a direct effect on motor neurons or '*Vata Vaahini Naadi*' and it provides quick relief or '*Aashukari*'. Therefore, it provides quick results in the ailments related to various types of pain as mentioned in the classical text *Rasa Tarangini*.<sup>46</sup>

**Table no: 6 Sampraptighataka**<sup>47</sup>

|              |                                   |
|--------------|-----------------------------------|
| Dosha        | Vata Pradhana Tridosha            |
| Vata         | Vyana, Apana                      |
| Pitta        | Ranjaka, Pachaka                  |
| Kapha        | as Anubandhita Doshas             |
| Dhatu        | Rasa, Rakta, Artava               |
| Upadhatu     | Artava                            |
| Agni         | Jatharagni, Rasagni, Raktagni     |
| Srotasa      | Rasa, Rakta and ArtavavahaSrotasa |
| Srotodushhti | Sanga and Vimargagamana           |

|                 |               |
|-----------------|---------------|
| Udbhavasthana   | Amapakvashaya |
| Rogamarga       | Abyantara     |
| SthanaSamshraya | Garbhashaya   |
| VyaktiSthana    | Garbhashaya   |

### **Bhanga (Cannabis) In Pain Management-**

The separating and affective aspects of pain are attributed to the two main ascending routes in mammals that are dedicated to pain: the spinothalamic pathway and the spinoparabrachial pathway. The lower brain stem and spinal cord are the destinations of the descending control of pain, which can be either facilitatory or inhibitory and has its origins in the higher cortical regions of the amygdala and hypothalamus.<sup>48</sup> The ascending and descending pathways both express the endocannabinoid system. Both alone and in combination, the cannabinoid receptors 1 and 2 (CB1 and CB2) have been thoroughly investigated as antinociceptive receptors<sup>49</sup> There are about 60 cannabinoids in one cannabis plant. Endogenous or exogenous substances that act on cannabinoid receptors are known as cannabinoids.<sup>50</sup>

### **Risk in Bhanga (Cannabis) Use**

1. Pregnant women who use *Bhanga* (cannabis) may have more unfavourable consequences for their unborn children.<sup>51</sup>
2. A growing body of evidence points to negative effects even though the majority of the research on marijuana use during pregnancy is constrained by study design and confounding variables. Research has revealed correlations between in-utero exposure and reduced birth weight, increased spontaneous preterm delivery, and poorer neurodevelopment in both children and adults.<sup>52</sup>
3. Products containing *Bhanga* (cannabis) may also raise your chance of developing certain illnesses, such as schizophrenia and depression. That's why they are used under the supervision of doctors.<sup>53</sup>
4. Although euphoria is the most common side effect of *Bhanga* (cannabis), some people may experience panic, fear, or depression.<sup>54, 55</sup>

## **DISCUSSION**

In this review article, we scabble about the pharmacological properties, synonyms and formulations of *Bhanga* (*Cannabis sativa* Linn), which is available in the market, an herb extensively used in traditional medicine for managing Insomnia, various types of pain, such as *Kashtārtava* (Dysmenorrhea) and its associated effects. Our exploration sheds light on the potential therapeutic benefits of *Bhanga*, particularly focusing on its active component, that is tetrahydrocannabinol (THC), which is known for its medicinal properties. *Bhanga* exhibits a spectrum of pharmacological properties, i.e *Tikta Rasa, Laghu, Tikṣna Guna, Usna Virya and Kaṣu Vipaka*. It pacifies *Kapha and Vata Doshas*, increases *Pitta Doṣha* and has *Depana, Pachana, Rochana, Madakāri* and *Vyavāyi* action, including *Vednasthapana* (analgesic), *Shothahara* (anti-inflammatory), *Chhardighna* (anti-emetic), and neuroprotective effects. These properties render it valuable in pain management, nausea relief, and neurological disorders, all of which are associated symptoms in Dysmenorrhea. Its traditional use reflects the deep-rooted knowledge of ancient Indian medicine in harnessing the therapeutic potential of natural substances for alleviating menstrual discomfort. Despite its traditional use and recognized pharmacological properties, *Bhanga* faces legal constraints due to its inclusion in Schedule E1 of the Drug & Cosmetics Act 1940 and Rule 1945. Our review highlights the *Shodhana* procedures described in different texts, after that *Sampraptighataka* in *Kashtartava*. The existing body of research remains constrained, necessitating further investigation into its safety and efficacy in managing menstrual discomfort. Additionally, the psychoactive nature of THC raises concerns regarding its impact on mood and cognition, warranting cautious consideration in clinical applications. In conclusion, this review provides an overview of the potential uses of *Bhanga* in managing the symptoms and associated effects of



Dysmenorrhea within the traditional framework. While acknowledging its therapeutic promise, we emphasize the importance of further research and careful consideration of legal and cultural factors in harnessing the medicinal benefits of *Bhanga* for menstrual discomfort.

## CONCLUSION

In this comprehensive review, we have explored the pharmacological properties, traditional uses, and challenges associated with the utilization of *Bhanga* (*Cannabis sativa* Linn) in managing *Kashtārtava* (Dysmenorrhea) and its associated effects. Our analysis underscores the therapeutic potential of *Bhanga*, particularly its active component, tetrahydrocannabinol (THC), which exhibits analgesic, anti-inflammatory, antiemetic, and neuroprotective properties. In summary, the pharmacological and cognitive benefits of *Bhanga* presents a promising avenue for managing Dysmenorrhea. By tapping into its analgesic properties and ability to reduce discomfort, *Bhanga* offers a natural and potentially effective solution for women experiencing menstrual pain. Furthermore, the cognitive benefits that enhance mood and reduce anxiety can significantly improve the overall quality of life for individuals battling Dysmenorrhea. As research in this area continues to evolve, the potential of *Bhanga* as a therapeutic option for menstrual pain management shines brightly. Embracing the holistic approach of integrating pharmacological and cognitive benefits of *Bhanga* could bring relief and empowerment to those suffering from Dysmenorrhea.

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