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## RESEARCH ARTICLE

# GHRIT-KUMARI KSHARSUTRA IN BHAGANDARA; A CRITICAL REVIEW

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### ABSTRACT

*Ayurveda*, the science of life, evolved from the quest of man to have a happy life, through a deep understanding of evolution, creation and its maintenance, perceived by the *Maharishis* of ancient India. The progressive establishment of scientific *Ayurveda* began in the *Vedic* period. It is a traditional healthcare system of Indian medicine since ancient times. Several *Ayurvedic* medicines are being exploited for management of various diseases in human beings. Among these various diseases *Bhagandar roga* is one important ailment with gradually increasing incidence in present era. It is a condition that commonly affects *Bhaga*, *Guda*, and *Basti Pradesha*, which starts as *Pidika* then suppurates in due course of time manifests as *Bhagandar roga*. This disease is closely associated with Perianal fistula. Fistula is a frequent benign anorectal condition with major clinical manifestations of local pain, inflammation, sero-purulent discharge and distressful patient quality of life. The most common cause is nearly always by a previous anorectal abscess. It is a burning issue with a high proportion of cases in India, and there is still no convinced solution in modern surgery. Among all parasurgical techniques, *Kshar-Sutra* Parasurgical process has shown to be most effective in treating anorectal fistulas. *Kshar-Sutra* is a preliminary exploration of sphincter sparing technology. It works by the action of excision, scraping, draining, penetrating, debridement and healing. During the past decades, several *Ayurvedic* medicated thread have been investigated with respect to Physio-chemical standardization, pharmacological effect, safety and efficacy. In this regard, an attempt has been made to explore characteristics of three different drugs for preparation of a new *Kshar-Sutra*.

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## INTRODUCTION

Perianal fistula, is a chronic aberrant communication between the epithelialized surface of the anorectal canal and the perianal skin. The fistula is lined with granulation tissue and typically results from the healing of perianal sepsis<sup>1</sup>. *Bhagandara* is a disease classified as *Ashta-Mahagada*<sup>2</sup> in our classical text. *Ashta - Mahagada* translates as the eight cripple and fatal diseases which are said to be great diseases because of their incurable nature. *Bhagandara roga* is a disease of *Guda Pradesha*, which causes a lot of agony to the patient and may even lead to serious consequences. It is a chronic suppurative disease which is well known for chronic perianal pus discharge, frequent exacerbation and recurrences after treatment. At present, an anal fistula cannot heal naturally without any intervention. Surgery is commonly practiced by allopathic surgeons for anal fistula but post operative complications are always present; and recurrence rate is high. *Ksharsutra*<sup>3</sup> therapy is a boon in present era for various anorectal diseases. It has been successfully used in *Bhagandara* patients whether patients suffer from recurrence fistula or complex type of fistula. There is no comparison of *Ksharsutra* therapy with other modalities as far as the results are concerned.

India has a very rich tradition of remarkable use of medicinal plants for ensuring health security to its rich population. Although India has been successful in promoting its therapies with more research and science based approach, it still needs more extensive research and evidence base. *Ksharsutra* therapy is one of the best treatment modality made up of different herbal drugs. Drugs to be explored in this article are *Rala*<sup>4</sup>, *Ghrít-kumari*<sup>5</sup> and *Daruharidra*<sup>6</sup>. In *Sushruta Samhita*, *Kshara* is considered as superior to all surgical and parasurgical measures due to their *Chhedana*, *Bhedana* and *Lekhana* action. *Kshar* possess the qualities viz, *Tridoshaghna*, *Saumyata*, *Dahan*, *Pachana*, *Darana*, *Katuka*, *Ushna*, *Tikshna*, *Vilayana*, *Shodhana*, *Ropan*, *Shoshana*, *Stambhana*, *Lekhana*, *Krimigha*<sup>7</sup>. *Acharya Charak* attributed two more properties *Laghu* and *Bhedana*<sup>8</sup>. Due to all these amazing properties *Kshar-Sutra* therapy gives incredible results. The introduction of *Ksharsutra* into fistulous tract gradually dissolve the fibrous tissues, drain the pus and enhance the healthy granulation tissue formation in the tract. Their therapeutic action and uses describe in our traditional literature. A lot of research work have been done and lot of going on to analyse the modern pharmacological and toxicological effect.

## MATERIALS AND METHODS

Acharya Chakrapani Dutta revealed the technique of preparation and indications of *Ksharsutra* in the late eleventh century<sup>9</sup>. Acharya Sushruta first mentioned *Ksharasutra* in the treatment of *Nadi Vrana* (sinus), *Bhangandara*, *Arbuda* (benign tumor)<sup>10</sup>. Various types of *Kshar Dravya*, such as *Kutaj*, *Palaash*, *Ashwakarna*, *Paribhadra*, *Vibhitak*, *Argwadha*, *Tiwak*, *Arka*, *Snuhi*, *Apamarga*, *Patla*, *Naktamaal* (Karanj), *Vrisha*, *Kadali*, *Chitrak*, *Puteek*, *Indravriksha*, *Sariva* (*Aasphota*), *Ashwamarak* (*Kaner*), *Saptachadha* (*Saptaparna*), *Agnimantha*, *Gunja*, *Koshataki* 4 types are described in *Sushruta Samhita*<sup>11</sup>. So many studies have already been carried out with variations in *Kshara* and *Latex*, so there are many herbal drugs used for the preparation of *Ksharsutra*. Exploration of plant's chemical constituents and pharmacological screening may provide strength to rely on herbal medicines. In this context, the study is going on with these drugs i.e. *Rala*, *Ghritkumari* and *Daruharidra* to see their effect on *Bhagandar*. In the preparation of *Kshar-Sutra*, these herbal drugs are as follows :-

*Rala- Sarja rasa* (*Shorea robusta* resin, Family- *Dipterocarpaceae*)<sup>12</sup>  
*Ghritkumari Kshara* (*Aloe barbadensis*, Family- *Asphodelaceae*)<sup>13</sup>  
*Daruharidra Churna* (*Berberis aristata*, Family - *Berberidaceae*)<sup>14</sup>

**Rala or Sarja Rasa (Shorea Robusta Resin):** *Rala* is collected, then cleaned, dried and processed into a fine powder in a mixer jar. In this study, *Rala* is used as a binding agent, dissolved in isopropyl alcohol solution and leave it for 4 to 6 hours. It dissolves approximately 70% in solution, and then filtered to be used as a binding agent for coating with the help of soaked gauze piece.

### GHRITKUMARI KSHARA PREPARATION

**Collection of Ghritkumari Panchang:** Fresh, well developed and mature *Ghritkumari Panchang* (plant as a whole of *Aloevera barbedensis*) was collected and authentication of *Aloevera* was done on the basis of Pharmacognostical Characteristics. Collected material was cleaned and dried completely, which took about two months. As it contains 99% of water in its greatest concentration, therefore drying takes an extended period of time.

**Preparation of Ghritkumari Kshara:** After removing all the impurities, *Ghritkumari Panchang* was cut into small pieces and left to dry fully. When it become fully dried, then it was burnt in *Kshar Dahan Yantra* completely. After the self cooling overnight, greyish black coloured ash was carefully collected from *Dahan Yantra*.

**Preparation of Kshara Drava or Ksharajala:** Six times of clean water was added to collected ash in a big vessel and left for few hours. Now, the upper clear fluid was gently separated from the settled ash. This collected fluid was subject to filtration with a clean cotton cloth. Filtration process was continued for twenty one times, and a clear fluid was obtained i.e. *Ksharajala*<sup>15</sup>. Thereafter, this *Ksharajala* was subjected to boiling in a heavy based big utensil. Continuous stirring was done. Eventually, a dried powder was obtained. This *Kshara* was weighed and stored in air tight dry container.

**Daruharidra Churna** - Rhizome of *Daruharidra* was collected after proper authentication. This rhizome was dried and then cut into pieces; there pieces was subjected to grinder and powder was obtained. Thereafter, it was filtered with a fine cotton cloth so as to spare the big coarse particles. Ultimately, uniform fine powder was obtained.

**Preparation of Ksharasutra** – Surgical linen thread number 20 (Barbour's thread) was used for preparation of *Ksharsutra*<sup>16</sup>. This Barbour's thread is tied to one end of the hanger and hooked to all the notches till the other end of the hanger. The thread was then smeared with *Rala* by the help of clean sterile gauze and coated manually eleven times in *Ksharsutra* hangers on the stand( One coating per day).

Following this, the seven coatings of *Ghritkumari Kshara* and *Rala* were applied( One coating per day). Three coatings of *Rala* and *Daruharidra churna* are applied in the final step in last three days. This prepared *Ksharasutra* was kept in *Ksharsutra* cabinet after every coating, which has a supply of warm air at a controlled temperature to dry the *Ksharasutra* and also sterilize it with ultraviolet light present in cabinet. In order to dry and sterilize the wet hangers of the thread. Finally the prepared *Ksharasutra* was cut into equal pieces and transferred into sterile test tube's made of borosilicate carefully. Then test tubes were kept in formaline chamber.

Thus, twenty one coatings over the *Ksharsutra* were completed in following order:-

1. <i>Rala Niryas</i>	11 Coatings
2. <i>Rala Niryas + Ghritkumari Kshara</i>	7 Coatings
3. <i>Rala Niryas + Daruharidra Churna</i>	3 Coatings
Total coatings on <i>Ksharasutra</i>	21 Coatings

**Packing of Ksharasutra** - The prepared *Rala-Ghritkumari Kshara Sutra* was packed & sealed under aseptic precautions, and then stored in Formalin chamber in operation theatre, and ready for application in *Bhagandara* patients.

**Mechanism of action** - *Ksharsutra* is now well accepted and approved modality in India as well as in other countries for patients of *Bhagandara* (fistula in ano). Numerous clinical investigations and studies have been conducted to determine the plausible mode of action of the *Ksharsutra*. These numerous clinical and analytical research's findings indicate that linen thread supports the weight of 21 coatings and the strength of the ligation in *Ksharsutra* therapy. The both ends of *Ksharasutra* are tied together and replaced by the new one a week later. This way in *Bhagandara* (fistula in ano) the *Ksharsutra* allows the proper drainage of pus and the debridement of unhealthy tissues also provide infection free field for the growth of healthy granulation tissues, which leads to healthy wound healing with minimal scarring and no complications.

*Ral* or *Sarja rasa* acts as a binding agent along with other properties for maintaining all of the qualities of *Kshara*, which dissolves all the unhealthy tissues. *Ghritkumari Kshara* remains in direct contact of the tract and therefore, it physically and chemically cures out the tract and sloughs out its lining, thereby allowing it to collapse and heal. Due to its *Ksharana Guna* it causes engorged tissue disintegration (corrosive properties). *Daruharidra* provides bactericidal action with healing properties. All these three drugs do not contradict each other but rather support their action by equal and desirable effect. *Ksharasutra* has the ability to perform incision with excision slowly by virtue of its controlled chemical cauterization. During cutting effect, there may be oozing of blood which is ceased by sclerosing effect of *Kshara* by its protein coagulation property. Hence, there is no chance of bleeding during the cutting of lesion site, and the chance of infection are least due to sustained action of anti-infective virtue of *Kshara*.

### Content of the Ksharasutra

S.no.	Sanskrit Name	Latin Name	Family
1.	<i>Ral/ Sarja Ras</i>	<i>Shorea robusta resin</i>	<i>Dipterocarpaceae</i>
2.	<i>Ghritkumari</i>	<i>Aloe vera barbedensis</i>	<i>Asphodelaceae</i>
3.	<i>Daruharidra</i>	<i>Berberis aristata</i>	<i>Berberidaceae</i>

## DRUG REVIEW

### 1. SAL

**Scientific name** - *Shorea robusta*

**Family** - *Dipterocarpaceae*

LIST OF PHYTOCONSTITUENTS REPORTED FROM DIFFERENT PARTS OF *SHOREA ROBUSTA*<sup>21</sup>

S.No.	Phytoconstituents	Part of Plant	Reference
1.	1,2,4-Benzenetriol; Ethyl (trimethyl)silane; D-Mannitol 1,3,5,7-Tetraethyl-1-butoxycyclotetrasiloxane	Bark	(Marandi <i>et al.</i> , 2016)
2.	Methyloct-5-yn-4-yl 2,2,2-trichloroacetate; Cyclooctene, 5, 6-dimethylene; Propyl octane-2-yl carbonate; n-Hexadecanoic acid (Palmitic acid); Phytol; Cyclohexane-1,3-dione; 2-allylaminomethylene-5,5-dimethyl; Trimethylsilyl 3-methyl4[(trimethylsilyloxy)benzoate; -amyrin, friedelin; -sitosterol; -carotene; -carotene; Lutein; Phenophytin; 7-methoxy-4'-5 dihydroxyisoflavone	Leaf	(Marandi <i>et al.</i> , 2016, Chauhan <i>et al.</i> , 2002)
3.	Hexadecyltrichloroacetate; Cyclooctane, methyl-2-Decanol; Stearic acid; Hexamethyl Cyclotrisiloxane	Seed	(Marandi <i>et al.</i> , 2016)
4.	2,3,23-trihydroxy-11-methoxy-urs-12-en-28-oic acid; Coumarin; -amyrin; -amyrin; Taraxasterol; Amino-glutethimide; Neoisolongifolene, 8-bromo-4-azapyrine; Cycloisolongifolene; Cyclotrisiloxane; Caryophyllene; (-)-Spathulenol; Cycloisolongifolene; Isolongifolene; Alloaromadendrene oxide-(1); (-)-Neoclovene-(1); dihydroisoaromadendrene epoxide; Longifolenaldehyde; Spirooctane; Epiglobulol; -Humulene; Tetrasiloxane, decamethyl-Silane; 3,25-epoxy-1,2,3,11-tetrahydroxyurs-12-en-28-oic acid; Ursolic acid; 2,3-dihydroxyurs-12-en-28-oic acid; 2,3-dihydroxy-urs-12-en-28-oic acid; 3,23-dihydroxyurs-12-en-28-oic acid; 2,3,23-trihydroxy-urs-12-en-28-oic acid; Nitro-L-arginine; Hexanoic acid; Caryophyllene; Caryophyllene oxide; Ledene oxide-(II); Calarene epoxide; Alloaromadendrene oxide- (1); Gamma-Gurjunenepoxide (2); Isocaryophyllene; Anthracene; Culmorin; Butanoic acid; Corticosterone; 2-ethylacridine; Ursa-9(11), 12-dien-3-one -Guaiene; Lanosterol; Ursa-9(11),12-dien-3-one; Ursa-9(11),12-dien-3-ol;-amyrin; -amyrin; Humulane-1, 6-dien-3-ol; Taraxasterol; Fluoranthene; Lupeol; 9-anthracene carbonitrile; Cytisine; 2,3-dimethyl amphetamine; 3, 25-epoxy 1,2,3-trihydroxyurs-12-en-28-oic acid	Resin	Misra and Ahmad 1997, Rai and Bapuji, 1993, Vashisht <i>et al.</i> , 2017)
5.	Asiatic acid; 3,25-epoxy-1,2,3,11-tetrahydroxyurs-12-en-28-oic acid; Phayomphenol; 7-O-L-rhamnopyranosyl-(1,4)-L-rhamnopyranosyl-(1,6)-D-glucopyranoside, 3,25-epoxy-1,2,3-trihydroxyurs-12-en-28-oic Acid; 3,7-dihydroxy-8-methoxyflavone	Root	(Sharma <i>et al.</i> , 2015)
6.	Phenol; 3-(prop-2-en-1-yl) cyclohexene; Pentanoic acid, 4-oxo-, ethyl ester; 3-Octenoic acid, methyl(tetramethylene) silan; Butanedioic acid; Diethyl ester; 3-acetoxy-4,4,8,10,14-pentamethyl-17; 3-acetoxy-4,4,8,10,14-pentamethyl-17; Naphthalene, hexahydro-1,6-dimethyl-4-(11H-Cycloprop [e]azulen-7-ol; 1R,4S,7S,11R-2,2,4,8-Tetramethyltricyclo Ledene alcohol; 2-(4a,8-Dimethyl-1,2,3,4,4a,5,6,7-octahy - Benzene, 1,3- Bis (1,1-dimethylethyl)-2-me Ledene alcohol; 1-Fluoro forskolin; 5,9- Methano-benzocycloocten-1(2H)-one, 3, CloctolonePivalate; Tris(2,6-dimethylphenyl)borane; 2,5-Bis(1-methyl-1-silacyclobutyl)-p-xyl Bis(2-ethylhexyl) phthalate; Methylprednisolone; Ursa-9(11),12-dien-3-ol;Tetracosanoic acid; tert-butyl dimethyls, Ursa-9(11),12-dien-3-one	Oleo resin	(Yusuf and Srinivasan, 2015)

Phytochemical constituents & Pharmacological properties of *Aloe barbadensis*<sup>30</sup>

S. No.	Constituents and Identification	Properties
1.	Amino acids -20-22 amino acids & 7 essential ones	Basic building blocks of proteins in the body and muscle tissues
2.	Anthraquinones – provide Aloe emodin, Aloetic acid, anthracin	Analgesics, Antibacterial
3.	Enzymes – Anthranol, barbaloin, smodin, ethereal oil, resistannol	Antifungal, Antiviral activity
4.	Hormones – Auxins & gibberellins	Wound healing and Antiinflammatory
5.	Minerals – Calcium, chromium, copper, iron, manganese, potassium, sodium and zinc	Essentials for good health
6.	Salicylic acid – Aspirin like compounds	Analgesics
7.	Saponin - glycosides	Cleansing and antiseptic
8.	Steroids - Cholesterol, campesterol, lupeol, sistosterol	Anti-inflammatory agents, lupeol has antiseptic and analgesic properties
9.	Sugars - Monosaccharide ; glucose and fructose & polysaccharides ; glucomannans	Antiviral, immunomodulator
10.	Vitamins – A, B, C, E, Choline, B12, Folic acid	Antioxidant (A, C, E ) neutralizes free radicals

Phytochemical constituents and Pharmacological properties of *Berberis aristata* <sup>40</sup>

S.No	Extract	Pharmacological activity
1.	Aqueous and methanolic extract	Hepatoprotective, Anti-inflammatory
2.	Alkaloid and hexane extract	Antimicrobial, Antibacterial, Antifungal
3.	Root extract & stem extract	Antidiarrhoeal
4.	Ethanollic and alcoholic extract	Anti- glyceemic
5.	Methanolic extract	Anti-cancerous
6.	Aqueous ethanolic extract	Antioxidant
7.	Alcoholic extract	Anti- platelet
8.	Fruit extract & stem extract	Cardio tonic

**Classical Categorization**

*Acharya Sushrut - Salsaradi gana , Rodhradi gana*<sup>17</sup>

*Acharya Charak – Vedanasthapana Mahakashaya , Kashya-Skandha*<sup>18</sup>

*Raj Nighantu, Dhanwantari Nighantu – Chandanadi Varga*<sup>19</sup>

*Rasa- Panchaka & Doshkarma of Ral*<sup>20</sup>

*Rasa - Kashaya, Madhur(Ral)*

*Guna- Ruksha*

*Virya - Sheeta*

*Vipaka - Katu*

*Prabhava - Vedanasthapana, Stambhana*

*Doshkarma - Vata-Pittahara (Raj Nighantu)*

*Part used- Ral (or Sal niryasa- Shorea robusta resin)*

**Ral** - Oleo-resin of *Shorea robusta* is called as *Sal Niryasa, Ral, Sarja rasa* etc. It was collected in two seasons as per the reference of *Acharya Charak* and *Acharya Sushrut* in *Hemant Ritu* and in *Vasant Ritu*. *Ayurvedic* text declared that *Ral* or *Sarja Ras (Shorea robusta resin)* posses *Sheeta Virya, Katu Vipaka* so it pacifies *Pitta and Kapha Dosha*. The Oleo resin exude obtained from the plant is whitish brown in color, hot in nature, sweet, astringent, carminative and stomachic properties. It is *Vedanasthapana and Daahprashaman*. *Ral* extract relieves pain caused by wound, ulcer or burn. It also helps in fracture healing, pruritus, neuralgia etc. *Acharya Priyavrat Sharma* mentioned in *Bhavprakash*, *Ral* is transparent and crystal clear, and it's bark possesses 7-12 alkaloids. It is mentioned as *Vranashodhak, Vranaropan, Sandhaneeya* and *Jantughna*. In *Dhanwantari Nighantu*, *Ral* is mentioned as *Sphot-Kandu-Vrana Nashak*. In *Raj Nighantu* *Ral* acts as *Sthambhana, Vipadibhuthanta* and *Bhagnasandhankrit*. In this present study, *Ral* is used as a binding agent as well as for its therapeutic benefits. It has mainly two triterpenoids which plays the prominent role for their therapeutic potential in the drug. It acts as a powerful potent astringent. It has a natural sticky texture and is helpful in reducing used to reduce irritation and inflammation. Some pharmacological significant molecules isolated from *S. robusta* include bergenin, ursolic acid, caryophyllene oxide, calarene epoxide, lupeol, humulene, amyryl, caryophyllene, etc. *Ral* has been scientifically evaluated on experimental animals and reported to possess analgesic, anticancer, anticonvulsant, anti-diabetic, anti-hyperlipidemic, anti-inflammatory, antimicrobial, antioxidant<sup>22</sup>, antipyretic, antiulcer, immunomodulatory, wound healing activity<sup>23</sup>, etc. *Ral* is drug having multi-therapeutic potentials.

**GHRIT-KUMARI:** *Ghrítumari* is a famous herb used in *Ayurveda* since long time ago. It is known as *Kumari, Graha Kanya*, and *Ghrítumarika*. *Acharya Bhavaprakash* has given a good description of the pharmacological actions and therapeutic indications of *Ghrítumari*<sup>24</sup>. According to him *Ghrítumari* possesses *Katu ras* and *Tikta Vipaka*, also *Sheet* in nature. By these virtues it performs many pharmacological actions such as *Bhedan, Rajahpravartaka , Chakshushya, Bringham, Balya, Vrishya, Rasayana*, and alleviates specifically *Vata and Visha* (toxins), etc. He recommends this drug for the treatment of various diseases such as *Jvara, Jeerna jvara, Granthi, Agnidagdha, Visphota, Twakaroga* (skin diseases), etc. It helps to balance all three *Doshas*, and especially pacifies *Kapha-Pitta Doshas*. *Acharya Sharangdhara*, in 13th century, described extremely effective preparation of *Ghrít-Kumari* known as *Kumariasava*, which is very popularly used by present clinicians<sup>25</sup>. *Aloe barbadensis* or *Aloe vera*, a semi tropical plant, is a member of *Liliaceae* family. The plant has lance-shaped, sharp pointed, and jagged, edged leaves. This *Aloe vera* is found throughout most of the tropics and warmer regions

of the World, India and other parts of Asia. The main feature of the *Aloe vera* plant is its high water content, ranging from 99% to 99.5%.

**Scientific name - *Aloe barbadensis***

**Family- *Asphodelaceae (Liliaceae)***

**Classical categorization of *Ghrít-kumari***

*Acharya Bhavprakash – Guduchyadi Varga*<sup>26</sup>

*Raj-Nighantu – Parpatadi Varga*<sup>27</sup>

*Kaideva Nighantu – Aushadhi Varga*<sup>28</sup>

***Rasa Panchaka & Doshkarma of Ghrít-kumari***<sup>29</sup>

*Rasa -Katu*

*Guna - Guru, Snigdha, Pichhila*

*Virya - Sheeta*

*Vipaka - Tikta*

*Prabhava - Vedanasthapana, Vrana Ropana, Shothhar*

*Doshkarma - Kapha-Pittahara*

*Part used – Panchang*

*Acharya Shodhal*, for the first time in 14th century, introduced this plant in *Nighantus*. He described it as *Kushtha-Vinashini* which destroys all types of skin diseases. *Acharya Kaideva* considered *Kumari* as *Vrishya* as well as *Rasayana*. *Kaideva Nighantu* specifically mentioned properties of *Ghrítumari pushp* (Flower) which is *Guru* and *Krimihar*, and also other qualities in detail. In *Raj Nighantu*, *Pandit Narhari* described that *Ghrít-kumari* alleviates *Kapha Pitta Dosha* and possesses *Kushtha* and *Visha Nashak* property. *Aloe vera* is a very versatile plant having many different chemical constituents and pharmacological activities. The presence of six simple compounds including lupeol, salicylic acid, urea nitrogen, cinnamonic , phenols, and sulfur, contributes to the sterile assets of *Aloe vera*. These mixtures have inhibiting effect on parasites, germs, and illnesses. It significantly boosts both fibroblast and keratinocyte cell proliferation and migration. It increases the amount of collagen in wounds, alters the collagen's chemical makeup, and increases collagen cross-linking, all of which aid in the healing process. Numerous scientific studies on this plant have demonstrated its analgesic, anti-inflammatory, antiseptic activity, wound healing, immune modulating and anti-tumor activities as well as antiviral, antibacterial, and antifungal properties<sup>31</sup>. The polysaccharides are glucomannan, mannans(acetylated) and pectin which strengthens the immune system by stimulating the macrophages and white blood cells. *Aloe vera* is widely used in *Dermatology* and it acts as an astringent, moisturizer, humidifier and cleanser. It was regarded as a blessing by the ancient experts that it is a natural healer, and people have been using *Aloe vera*'s medicinal properties for generations, earning the epithet "Plant of Immortality" for it.

**DARU-HARIDRA**

*Daru-haridra* is a well-known plant with a long history. It is an incredible *Ayurvedic* herb that has made its way into almost all cultures including *Ayurveda*, Homeopathy, Unani, Chinese, and Allopathy due to their curative qualities and therapeutic actions. *Daruharidra* is also known as Indian berberry or tree turmeric. *Acharya Sushruta* has included *Daruharidra* in *Haridradi gana, Lakshadi gana* and *Mustadi gana*. *Acharya* mentioned that it act as *Vrana Ropana, Dushta Vrana-Vishodhak* and *Krimi- Kushtnashak*. *Acharya Charak* described *Daru-haridra* for *Vrana ropana*.<sup>32</sup> *Daruharidra* is *Berberis aristata* which belongs to the family *Berberidaceae* . It is a spiny, hard, erect, deciduous shrub, usually 2 – 3.6 meter in height found in *Himalayan* ranges in the *Nilgiri* hills of South India. It is a woody plant, with bark that appears yellowish-brown outside with yellowish hue inside. According to published clinical and experimental researches various alkaloids are present in this plant which offers potent benefits<sup>33</sup>. These alkaloids are berberin, oxyberberine, aromoline, taxilamine, aromoline, karachine, palmatine, tannins, sugar, starch. Berberine is widely present in *Berberis aristata*. *Daru-haridra* is effective in various inflammatory conditions, high

blood pressure, irregular menstrual cycles, ocular irritation, and wound healing<sup>34</sup>.

**Scientific name** – *Berberis aristata*

**Family** – *Berberidaceae*

**Classical categorization of Ghrit-kumari**

*Acharya Bhavprakash* – *Guduchyadi Varga*<sup>26</sup>

*Raj-Nighantu* – *Parpatadi Varga*<sup>27</sup>

*Kaideva Nighantu* – *Aushadhi Varga*<sup>28</sup>

**Rasa Panchaka & Doshakarma of Daruharidra**<sup>39</sup>

**Rasa-** Tikta, Kashaya

**Guna-** Laghu, Ruksha

**Virya** - Ushna

**Vipaka** - Katu

**Prabhav-** Kapha-pitta Shamak

**Doshkarma** – Shotha hara, Vrana shodhana, Vrana ropana,

*Acharya Sushruta* mentioned in *Bhagandar Chikitsa Sthan* that *Daruharidra* Kalk is *Nadivrana nashak*. *Daruharidra Siddha Taila* plays potent role in *Bhagandar roga* and *Pramehjanya vrana*. The effects of the *Pitta* and *Kapha doshas* are minimised<sup>41</sup>. In *Raj Nighantu*, *Daruharidra* is mentioned as *Vrana-mehmuta*. It is a definitive remedy for all sorts of skin diseases like *Kandu*, *Visarpa* and *Twakdosha*. Owing to its blood purifying qualities and *Kapha-Pitta* characteristics, it helps to remove toxins from blood and control skin infections. *Berberis aristata* is considered as most recognised therapeutic plant. Reported pharmacological activities of *B. aristata*, are proved by various scientific and experimental studies. The plant is reported to possess a range of pharmacological activities due to the presence of various beneficial alkaloids, it shows anti-inflammatory activity<sup>42</sup>, antimicrobial activity<sup>43</sup>, antioxidant and antiplatelet activity, also hepatoprotective<sup>44</sup>, immunomodulatory, cardiogenic action, analgesic, antipyretic, and cholegogue properties. To assess the plant's hepatoprotective properties, an immunomodulation experiment was carried out on golden hamsters. The plant's aqueous methanolic extract has hepatoprotective properties.

## DISCUSSION

In our classical text, *Acharya Sushruta* described *Shat-Kriya Kala in Sushruta Sutrasthana*<sup>45</sup>. It states that once the illness has begun, it advances via *Shat-Kriya Kala*, whose identification is essential for the prevention and curative purpose of disease. There is vitiated *Doshas Vata, Pitta, Kapha* and *Dushya Rakta, Mamsa*, eventually lodges in *Guda Pradesh*. During formation of *Bhagandara* first *Pidika* is formed and it get burst in the form of an abscess<sup>46</sup>. There is *Dosha* vitiation associated with pain and discharge. The glandular crypts at the level of the dentate line are the typical origin of anal fistulas, which is induced by purulent and inflammatory processes. Various therapeutic options are accessible in modern surgery; however, the recurrence rate of fistula in ano is very high, posing a significant challenge to the proctologist. *Kshar* eliminate the contaminated lesion, and continuous pressure necrosis results in progressive tract excision. *Kshar Sutra* is capable of performing *chhedan* (excision)<sup>47</sup> by virtue of its mechanical pressure and phytochemical cauterization. The recovery process is finished completely. The pressure exerted on anorectal tissue by the moderately tight *Kshar Sutra* tied in the fistulous tract affects the cut through of the fistulous tract. The presence of *Kshar Sutra* in the fistulous tract prevents the cavity from closing, resulting in continuous discharges of morbid tissues pus leakage and infection become settled down. Gradually, *Kshar Sutra* cuts through the fistulous tract from apex to periphery gently and gradually. There is a refine simultaneous cutting and healing of the tract, and no pus pocket is allowed to remain. *Kshara* used on the thread are anti-inflammatory, anti-slough agents, and have herbal curing properties. *Kshar Sutra* remains in direct contact with the tract, so it chemically cures the tract and adjacent

damaged tissues and sloughs off, allowing the fistulous tract to recover and heal. Due to its antibacterial properties, *Ksharsutra* prevents microorganisms from multiplying in its presence. The pH of *Ksharsutra* was on the alkaline side by which rectal bacteria are unable to infiltrate the cavity. By this mechanism, the *Ral-Ghritkumari Ksharsutra* achieves *Samprapti Vighatana* of *Bhagandar roga*. *Ral* shows *Vedna sthapan*, *Vrana shodhan* and *Vrana ropan* properties due to the presence of *Kashaya, Madhura Ras* and *Katu Vipaka*<sup>48</sup>. It is *Pittahar* in nature; therefore it reduces inflammation. This *Ral* is an excellent *Sandhaniya dravya*, with this quality, wound heals more quickly. According to *Raaj Nighantu*, it reduces *Vata* and *Pitta*, which minimises itching and improve the healing of wounds. Due to its *Stambhana* and *Bhagna-Sandhaankrita* characteristics, it is an effective antibacterial agent and promotes wound healing in fractures. *Ghrit-kumari* has anti-inflammatory, anti-septic and anti-biotic properties which help to reduce swelling, soothe the skin, reduce pain and promote healing. *Ghrit kumari* has many wonderful qualities that make it one of the best medicines for making *Kshara Sutra*. *Ghrit kumari's Tikta Rasa* help in the removal of pus from the fistula tract. Due to its *Sheetal* and *Madhura Guna*, it reduces *Pitta*, which ultimately reduces inflammation. *Acharyas* have mentioned that *Adhishtana* of *Bhagandara* is *Maans* and *Rakta*, and all the *Vikaras* of these *dhatu*s are relieved by *Ghritkumari*. It has *Vataghana* and *Vishaghana* properties<sup>49</sup>, by which it has the capacity to remove toxins created by microbes in the tract. *Tikta, Kashaya Rasa* of *Daruharidra*, pacifies the *Pitta-Kapha doshas* which help in reduces the inflammation. Due to its *Ruksha* and *Ushna guna*, it is said to be *Kapha shamak*<sup>50</sup>. According to *Raj Nighantu*, it is *Vrananut* and *Vishanut* so *Daruharidra* is quick wound healer and removes toxins, which are produced by microbes in the pus pocket of fistulous tracts. By the *Lekhana guna*, it has the ability to scrape out the sticky portion of the pus. It has *Kandughana* property, so it reduces itching.

The linen thread strengthens the ligation while the *Rala Niryas* is applied with *Ghrit-kumari* and *Daru-haridra*. It's *Kashaya, Madhura Ras* absorbs excess secretions, promote wound healing, and balances the *Doshas*. It retains almost all of the *Ghritkumari kshara* properties, which in fact liberates many folds of medicament with medical actions such as anti-inflammatory, antibacterial, antiseptic, antimicrobial activity and so on. The action of *Daruharidra* provides the effect of bactericidal activity with healing properties. All three medications complement each other by producing similar and desired results. As a whole, it can be concluded that the collective properties of *Ghritkumari* as *Vata-Pittahara, Daruharidra* as *Vata-Kaphahara*, and *Ral* as *Vata-Pittahara*, are capable of alleviating *Tridoshas* in *Bhagandara roga*. Complex toxic compounds are broken down by the *Bhedana guna* of *Kumari*, whilst the complexes are scraped out and eliminated by the *Lekhana guna* of *Daru haridra*. *Ghrit kumari* also nurtures the new tissues in the damaged area, specifically the *Mamsa* and the *Raktadhatu*. The wound healing is accelerated by *Sandhana* and *Ropana guna* of *Ghrit kumari*.

## CONCLUSION

Since *Ral-Ghritkumari Ksharsutra* contains *Tikta* and *Katu Rasa*, which has the property of *Puya Shoshana*. This will help to reduce secretions, which will minimize the effect of microbes in fistulous tract. *Ral-Ghritkumari Kshar-Sutra* has *Kashaya Rasa* due to which *Kshar sutra* possesses *Vrana Ropak* property in *Bhagandar*. It has *Katu Rasa, Lekhana* and *Bhedana guna* due to which *Ksharsutra* will show *Vrana Nashak* and *Krimi Nashak guna* which will help in cutting and healing of fistulous tract and also pacify the vitiated *Doshas* in *Bhagandar*. Thus, it can be concluded that, due to the above characteristics, *Ral-Ghritkumari Ksharsutra* can be successfully used for management of *Bhagandar roga*.

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