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## RESEARCH ARTICLE

### SANJEEVANI AND BISHALYAKARANI PLANTS-MYTH OR REAL !

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#### ABSTRACT

The use of plants to cure human diseases has been coming from ancient cultures, medicine practitioners used the extracts from plant to soothe and relieve aches and pains. Medicinal plants, and plant products are known to 'Ayurveda' in India since long times. In the very beginnings of Botany, doctors in both Europe and America researched herbs in their quest to cure diseases. Many of the plants that were discovered by ancient civilizations are still in use today. About three quarters of the world populations relies mainly on plants and plant extracts for health cure. It is true that many species of flora and fauna exhibit medicinal properties but amongst the most talked about are Sanjeevani ("restores life") and Bishalyakarani ("arrow remover"). In the Ramayana epic, the Hanuman went to search these magical plants in Dunagiri by getting advice of Sushena. Since beginning of human culture, people have been talking about the magical effects of these plants. Now scientists are searching these two plants in Himalayan mountains for the medical benefits in human society and they should be studied thoroughly.

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## INTRODUCTION

The *Ramayana* and other mythical stories / *puranas* that refer to *Sanjeevani* have remained a part of the cultural heritage for several millennia in the Indian sub-continent including certain neighboring countries such as Thailand, Indonesia and Cambodia. The *Sanjeevani* in literally meaning is something that offers life; (jeeva = life). Its habitat must be in mountain region. This epic (The *Ramayana*) tells us that Lakshman in battle field became dead /near to dead /unconscious by fatal attack with poisonous/ "Mantraputa" arrows. The Hanuman went to search this magical plant/s in Dunagiri. This mount proper itself is 2,290 m in the Himalaya, with a mountain that rises up to heights of 7,066 m one of the high peaks of the Garhwal Himalayas. From very early times, places such Drongiri (Dunagiri), Badrinath, Kedarnath have been known as Soul of Gods ("Devatma" Himalaya) since these places are also the meditation spots ('asanpeeth' and 'sadhna-sthali') of many spiritual souls. Dunagiri or Drongiri is counted amongst one of the seven 'Kulparvats of the Purans'. Whether the sanjeevani was a single plant or many plants? whether it / they was / were herb or shrub or tree? whether sanjeevani has the magical curing potentiality for 'resurrecting' life? Like many

queries including the controversy about its existence and identity are percolating with in our culture from time immemorial. The objective of this review article is to discuss its existence, the habit, habitat and medicinal values including 'resurrect' life amidst modern scientific approach/es.

### Flora of the Ramayana

In the ancient epics or Mahakavya, the *Ramayana* and *Mahabharata*, forest at various places are mentioned. The importance of plants in Indian epics reflected from the fact that each epic devotes one book to the forests. The *Ramayana* was divided into Kandas (Books). One Kanda known as 'Aranya Kanda' – Book of the Forest was present. 'Kishkindha Kanda' – Book of Kishkindha also described the geography and forestry of the region. Rama and Lakshman were guided to a deadly forest on the other bank of River Ganges and acquainted about the provinces Malada and Karusha by the sage Vishvamitra. Here 'shlokas' 12-18 described about the forest trees and plants of the region. Aranya Kanda shlokas 46, 49, 74-76 revealed many trees and plants. Aranya Kanda Sarga 15 mentioned about Panchavati situated on Godavari River in Nasik district in Maharashtra. The biodiversity of the area around Pampa Lake was mentioned in shlokas 12-18.([www.wikipedia.org](http://www.wikipedia.org)). *Ramayana-Kishkindha Kanda Sarga 1* described of Pampa Lake and about many forest trees in

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shlokas 73-83. In Kishkindha Kanda Sarga 40, Sugreeva commissioning Vinata explained the topography and geography of Eastern side of the Jambudvipa, where trees have been mentioned in shlokas 39, 53 and 56.

### Present biodiversity of plants in India

Biodiversity encompasses all biological entities occurring as an interacting system in a habitat or ecosystem and plants constitute a very important segment of such biological systems. India is a treasure chest of biodiversity which hosts a large variety of plants. Although its total land area is only 2.4 percent of the total geographical area of the world, the country accounts for eight percent of the total global biodiversity with an estimated 49000 species of plants of which 4900 are endemic (Kumar and Asija, 2000). In India vascular plants (Pteridophytes, Gymnosperms and angiosperms) account 20,648 sps of described plants (BSI, Kolkata). The ecosystems of the Himalayas, the Khasi and Mizo hills of northeastern India, the Vindhya and Satpura ranges of northern peninsular India, and the Western Ghats contain nearly 90 percent of the country's higher plant species and are therefore of special importance to traditional medicine. Although, a good proportion of species of Medicinal Plants (MP) do occur throughout the country, peninsular Indian forests and the Western Ghats are highly significant with respect to varietal richness (Parrota, 2001).

Medicinal plants which constitute a segment of the flora provide raw material for use in all the indigenous systems of medicine in India namely Ayurveda, Unani, Siddha and Tibetan Medicine. According to the World Health Organization (WHO), 80 percent of the population in developing countries relies on traditional medicine, mostly in the form of plant drugs for their health care needs. Additionally, modern medicines contain plant derivatives to the extent of about 25 percent.

On account of the fact that the derivatives of medicinal plants are non necrotic having no side effects, the demand of these plants is on the increase in both developing and developed countries. There are estimated to be around 25000 effective plants based on formulations available in Indian medicine. Over 1.5 million practitioners of the Indian system of medicine in the oral and codified streams use medicinal plants in preventive, promotional and curative applications. It is estimated that there are over 7800 medicinal drug manufacturing units in India, which consume about 2000 tons of herbs annually (Singh, 2001). According to Exim Bank, the international market for medicinal plant related trade is to the tune of US\$ 60 billion having a growth rate of seven percent per annum. The annual export of medicinal plants from India is valued at Rs. 1200 million (Ramakrishnappa, 2013).

### Number of plant species and number of medicinal species in different countries including India

There is a global resurgence of interest in the use of plant product/s to treat almost all diseases including the difficult –to-treat cancer! It has been long recognized that plants are inventive chemists that survive by their chemical wits (Ghosh, 2003). The number of plant species which have at one time or

another been used in some culture for medicinal purposes can only be estimated. An enumeration of the WHO from the late 1970s listed 21 000 medicinal species (FAO, 2013). However, in China alone 4941 of 26092 native species are used as drugs in Chinese traditional medicine (Duke and Ayensu, 1985), an astonishing 18.9 percent. The data presented in the table 1 indicated that in India 3000 sp of medicinal plants of total 15000sp of plants are being used in the traditional medicine, it is 20% and highest in the world. In global scenario total of 422000 flowering plant species are present (Govaert, 2001), while the number of plant species used for medicinal purposes is 52885 (Table 1).

**Table 1. Number of plant species and number of medicinal species in different countries including India and World**

Country	No. of plant species	No. of medical plant species	Percentage (%)
India	15000	3000	20.0
China	26 092	4941	18.9
Viet Nam	10 500	1 800	17.1
Sri Lanka	3 314	550	16.6
Thailand	11 625	1 800	15.5
USA	21 641	2 564	11.8
Nepal	6 973	700	10.0
Philippines	8 931	850	9.5
Malaysia	15 500	1 200	7.7
Pakistan	4 950	300	6.1
Indonesia	22 500	1 000	4.4
Average	13 366	1 700	12.5
World	422 000	52 885	

Sources: Duke and Ayensu (1985); Govaerts (2001); Groombridge and Jenkins (1994, 2002); Jain and De Fillippis (1991); Padua *et al.* (1999), FAO (2013)

In Himalaya region, 8500 sp of plants are recorded, out of them 2500 sp are medicinal. In Trans Himalaya regions, medicinal plants are estimated as 700 (FAO, 2013). In all medical systems (Ayurvede, Unany, Homeo, Siddha, Western, Floke, Floke (V.) TCM, Tibetan), 6,198 sp are recorded (Ravikumar, <http://www.apforgen.org>).

### Mythology behind Sanjeevani

Hindu mythology referred the Sanjeevani (literally meaning something that offers life; jeeva = life) as a magical herb which has the power to cure any diseases. It was believed that medicines prepared from this herb could revive a dead person. This herb is mentioned in the 'Yuddha Kand', the Ramayana. In the Valmiki Ramayana, Indrajeet strikes down most of the Devas and Ram's army with arrows by aerial attack under sky cover. Jambavan tells Hanuman, "O Hanuman you are the only one who can save the lives of the two brothers, as well as the lives of all the Vanaras. Go immediately to the golden peak on the mountain called Himavan which is rich in herbs and bring back the four magic herbs. The one called Mritasanjivi (Mrithasanjeevani, Sanjeevani, "restores life") will bring the dead back to life, and Bishalyakarani (Vishalyakarani, "arrow remover") will heal all wounds and the other two (Sandhanakarani, "frame restorer", Savarnyakarani, "color restorer") will reset fractured bones and give a glow to the skin". They always emit light. You have to come with those herbs at the earliest (Valmiki' Ramayana in the Shloka 29 to 34 of the 74th Chapter of the 'Yuddakandha'). In the Adhyatma Ramayan, Lakshman indirectly was struck by Ravan when

Lakshman tried to protect Vibhishana. Falling into unconsciousness, Lakshman was saved by Hanuman who obtained the Sanjeevani Booti healing herb to revive the stricken Lakshman. In the Tulsidas revelation Ramcharitmanas, Indrajeet injured Lakshman with a powerful weapon and he fell unconscious. Vibhishan advised Hanuman to bring the doctor Sushena from Lanka. Sushena instructed Hanuman to bring the Sanjeevani from the Himalayas. Actually Lakshman was attacked by poison/'mantraputa' arrows. What was the poison on these arrows? In the Himalayas there is a form of monksbane called *Aconitum luridum*, which is produced from the roots, is deadly in poisonous quality, and which is used to produce Warfare in which it's an anticoagulant. Today Dunagiri is identified as located in the state of Uttarakhand in India where six small villages are found in the region located at a height of 2,400 meters above sea level. There is a Devi temple which is known as Dunagiri Devi. Dunagiri proper itself is 2,290 m in the Himalaya, with a mountain that rises up to heights of 7,066 m which is one of the high peaks of the Garhwal Himalayas.

From very early times places such Drongiri (Dunagiri), Badrinath, Kedarnath have been known as Soul of Gods ('Devatma' Himalaya) since these places are also the meditation spots ('asanpeeth' and 'sadhna-sthali') of many spiritual souls. Dunagiri or Drongiri is counted amongst one of the seven Kulparvats of the Purans. In various Vedic texts and also in Ramayana it has been clearly mentioned that sanjeevani booti glows in the dark. When made slightly wet and kept in dark it glows; emits light. It is well worthy to mention here that sanjeevani vidya was present in the *Mahabharata*, another great Indian epic, was adopted by *Shukracharya*, the preceptor of Demons, to revive all the demons killed by the Gods. According to the Ramayana, while bringing the entire Gandhamardan range from the Himalayas to treat Lakshman with Sanjeevani, Hanuman, the monkey god, broke some parts of the mountain and the pieces fell at the place where today's Gandhamardan stands with its treasure of fragrant medicinal plants. Gandhamardan mountain range is known worldwide as a reservoir for medicinal plants. It is located in the western Odisha. More specifically, it is located in between Balangir and Bargarh districts in India. Many eminent scholars of biological science have done a lot of research work on the medicinal plants available in this mountain range. In fact, this hill range is legendary. It has found a place in folklore and mythology of how Hanuman plucked Sanjeevani / Bishalyakarani, a medicinal plant, from this hill to save the life of succumbed Lakshman in the battle of Lanka.

### Criteria for Sanjeevani

After detail study of the epic Ramayana, we have collected some characters / criteria of Sanjeevani. They are as follows

1. The plant must have been referred to in different languages in India with terms akin to/close to *Sanjeevani*.
2. It should be a plant growing at high altitude.
3. It should be a very potential medicinal plant.
4. It should be capable of 'resurrecting' life.
5. Sanjeevani is supposed to have the characteristic of bioluminescence or emitting light.

### Published Data Base for Sanjeevani

Ganeshaiyah *et al.* (2009) searched for the term *Sanjeevani* and its synonyms (words with similar meaning) or phononyms (words sounding phonetically similar) in Sanskrit in particular and in other languages as well from different literatures. They collected and listed of about 17 species of plants which were designated as Sanjeevani and akin to it (Table 2). They shortlisted eight species of plants which were frequently referred to Sanjeevani in Sanskrit language and the plant species are *Cressa cretica*, *Selaginella bryopteris*, *Desmotrichum fimbriatum*, *Malaxis acuminata*, *M. wallichii*, *Microstylis wallichii*, *Trichopus zeylanicus* and *Terminalia chebula* Only three final species were short listed which were *Cressa cretica*, *Selaginella bryopteris*, and *Desmotrichum fimbriatum* (Ganeshaiyah *et al.*, 2009).

What are about their habitat? Which are from the hills, which Hanuman would have sought? *C. cretica*, don't satisfy its habitat because it grows along dry tracks in the Deccan plateau or lowlands. So, according to them, Sanjeevani could be either *S. bryopteris* or *D. fimbriatum*. Now, the scientist trio used a Sherlock Holmes-type hypothesis. What would have been the criteria that physicians of the Ramayana era used as a medicinal principle? 'The Doctrine of Signature', a strong tenet used in ancient Indian traditional medicine posits that a plant with syndromes similar to the affected organ or body can be used to treat the disease. The plant *S. bryopteris* is a highly drought-tolerant plant that lies "dead", dry and inactive for months and at the first rain (or upon hydration) comes "alive", turning green and flush. If 'similar cures similar', was it *S. bryopteris* that "resurrected" Lakshmana? Out of which currently *Selaginella bryopteris* is considered as Sanjeevani. *Selaginella* existed before 300 million years and comes under a group of plants which were the first vascular plants on earth. (Fig.1)

*Sanjeevani* plant is also called *Rudanthee* or *Rudanthika* (*Geervana Laghu Kosha*, a Sanskrit, Marathi dictionary). *Shabdakalpadruma*, the encyclopedi Sanskrit dictionary, has the following entry on *Rudanthee*. It is a small shrub which oozes droplets of water in winter from leaves (hence the name *Rudanthika*: the weeping one) also called *Sravathova*, *Sanjeevani*, *Amruthasrava*, *Romanchika* and *Mahamamsee* with bitter, pungent, heat-generating and astringent. It is claimed that this plant extract kills germs, extends life-span by preventing the onset of old age.

### Sanjeevani in favour of *Selaginella*

Because of the remarkable medicinal properties, *S. bryopteris* has also been known as '*Sanjeevani*'. It is, therefore, that this herb possesses a growth-promoting activity as well as protective action against stress-induced cell death that play vital roles in organism growth and development, tissue homeostasis, and maintenance of genomic integrity. In appropriate apoptosis has been conclusively shown to result in several human diseases including cancer, neurodegenerative diseases such as atherosclerosis, Alzheimers, Parkinsons, etc.

Table 2. List of Plants that named as Sanjeevani or akin to it

S.No.	Scientific name	Family	Habit	Common name (in Sanskrit)
1.	<i>Desmotrichum fimbriatum</i>	Orchidaceae	Terrestrial herb	<i>Jeevaka, Jeeva, Jeevabhadra, Jeevavani, Jeevanthi, Jeevapatra, Jeeva pushpa, Jeevavardhini, Jeevadaathri, Jeevya, Rakthaanthi, Yashasya, Sukhankaari, Praanadha</i>
2.	<i>Dregea volubilis</i>	Asclepiadaceae	Woody vine, flowers are green or yellowish green, fruit follicle	Jeevanti
3.	<i>Cimicifuga foetida</i>	Ranunculaceae	Perennial growing to 1.5 m (5ft) by 0.6 m (2ft)	Jeevanti
4.	<i>Cressa cretica</i>	Convolvulaceae	Perennial thermocosmopolitan halophilous a few cm to 30 cm high herb, flower white and funnel shape	<i>Sanjeevani, Amruthashraava, Rudanthi, Madhushraava, Romaanchika</i>
5.	<i>Holostemma rheedii</i>	Asclepiadaceae	Perennial twining shrub that secretes milky latex. The leaves are ovate and flowers are fleshy pinkish-red. Tropical Himalayas and Western Peninsula., cultivated in Tamil Nadu(Darmapuri District)	Jeevanti
6.	<i>Leptadenia reticulata</i>	Asclepiadaceae	A climber in Gujarat, Punjab, Himalayan ranges, Khasia hills, Konkan, Nilgiris, South India, Sikkim, Deccan and Karnataka.	Jeevanti
7.	<i>Litsea chinensis</i>	Litseaceae	Tree, grows in Assam, flowers - small and yellowish, crowded in umbels in the axis of the upper leaves; Fruits - rounded, about 8 millimeters in diameter	Jeevani
8.	<i>Malaxis acuminata</i>	Orchidaceae	Herb in India, China, and South-East Asia, at elevations up to 1400 m, flowers minute, pale-yellowish green, tinged with purple, in terminal racemes	<i>Jeevaka</i>
9.	<i>Malaxis wallichii</i>	Orchidaceae	Herb, flowers minute, pale-yellowish green, tinged with purple, in terminal racemes	<i>Jeevaka</i>
10.	<i>Microstylis wallichii</i>	Orchidaceae	Herb, Northern Himalayas at altitudes of 1,500 to 2,800 m	<i>Jeevaka, Rishvan</i>
11.	<i>Putranjiva roxburghii</i>	Euphorbeaceae (Putranjivaceae)	Evergreen tree, growing up to 12 m in height having pendant branches and dark grey bark with horizontal lenticels; Leaves-simple, alternate dark green, shiny, elliptic-oblong, distantly serrated. Male flowers- with short stalks, in rounded axillary clusters, female flowers- 1-3 in leaf axil. Fruits- ellipsoid drupes; seed normally one, stone pointed, very hard. It grows in plain and low terrain.	Jeevanpatra
12.	<i>Selaginella bryopteris</i>	Selaginellaceae	Herb, a lithophytic xerophyte, grows on the hills of tropical areas, particularly the Arawali mountain terrains from east to west in India	<i>Sanjeevani, Sanjeevani Bhoothi</i>
13.	<i>Tinospora cordifolia</i>	Menispermaceae	Deciduous climbing shrub with greenish yellow typical flowers, found at higher altitude] In racemes or racemose panicles, the male flowers are clustered and female are solitary.	Jeevanthica:
14.	<i>Terminalia chebula</i>	Combretaceae.	Tree and grows in plain.	Jeevanthi, Jeevanika, Chethara
15.	<i>Trema orientalis</i>	Urticaceae	Small tree and grows in plain.	Jeevani
16.	<i>Trichopus zeylanicus</i>	Dioscoriaceae	A small herbaceous plant the Agasthia Hills in the Western Ghats, leaf cordate, rhizome present, grows in sandy & shady places.	Jeeva
17.	<i>Viscum articulatum</i>	Loranthaceae	Semi-parasitic leafless shrub, grows upon the branches of trees, flower small.	Jeevanthica:

Sah *et al.* (2005) provided scientific evidence for *S. bryopteris* as 'Sanjeevani'. The aqueous extract of *S. bryopteris* possesses growth-promoting activity as well as protective action against stress-induced cell death in a number of experimental cell

systems including mammalian cells. Treatment of the cells in culture with 10% aqueous extract enhanced cell growth by about 41% in *Sf9* cells and 78% in mammalian cells. Pre-treatment of cells with the *Selaginella* extract (SE) (1-

2×5%) protected against oxidative stress (H<sub>2</sub>O<sub>2</sub>)-induced cell death. The killing potential of ultra violet (UV) was also significantly reduced when the cells were pre-treated with SE for 1 h. Thermal radiation suppressed cell growth by about 50%. Pre-treatment of cells with SE for 1 h afforded complete protection against heat-induced growth suppression. SE may possess anti-stress and antioxidant activities that could be responsible for the observed effects. Chemical analysis shows that SE contains hexoses and proteins. Taken together, *S. bryopteris* extract may help in stress-induced complications including those due to heat shock (Sah *et al.*, 2005) (*Selaginella bryopteris*) has been reported to have the highest degrees of drought resistance. It is observed that this fern can withstand years of drought very effectively, and still there is no adverse effect in its vigor. The cause for this special power lies in its drought resistant gene. The detached fronds of *Selaginella bryopteris* have been said to have unique ability to survive desiccation similar to that of whole plant. In order to understand the mechanisms of desiccation tolerance, proteome studies were carried out using fronds of the *Selaginella bryopteris* to reveal proteins that were differentially expressed in response to dehydration and rehydration. (Antony & Thomas *et al.*, 2011)



Fig.1 *Selaginella bryopteris* in dry condition

### **Rhodiola as Sanjeevani**

*Rhodiola*, locally called "solo", is one herb grows in Ladakh of the high Himalayas. Generally *Rhodiola* has two sps in Ladakh region. They are *R rosea* and *R hereodonta*. The leafy parts of the plant were used as vegetable by locals. *Rhodiola rosea* is with yellow flowers and glaucous succulent leaves. However, research is going on by scientists of Defence Institute of High Altitude Research (DIHAR), Leha and they are trying to unearth the therapeutic values of the herb. (Times of India, IANS, 25<sup>th</sup> Aug 2014). According to verbal talk of RB Srivastava, Director, DIHAR, "*Rhodiola* is a wonder plant that has immunomodulatory (enhancing immune), adaptogenic (adapting to difficult climatic condition) and radio-protecting abilities due to presence of secondary metabolites and phytoactive compounds unique to the plant," He also added that the herb can mitigate the effects of gamma radiation used in bombs in biochemical warfare.

*Rhodiola* is also found in other parts of the world with other countries like the US and China engaging in research on the wonder herb. The plant has been used in traditional Chinese medicine to combat high-altitude sickness, while in Mongolia physicians prescribed it for tuberculosis and cancer. Researchers in Russia studied its impact on athletes and later on cosmonauts. Some other qualities of the plant is found to be containing in studies across the world include fast recovery after heavy workout, memory enhancement, and cardiac stress reduction

### **Other plants claimed to be Sanjeevani**

*Saussurea gossypiphora*, which is known as 'Phena Kamal' and 'Kasturi Kamal' in the local language. *Saussurea gossypiphora* grows at a height of 4300 – 5600 meters in different parts of Himalayas. It is around 15 -25 cm long herb and looks like a "snowball" and its flowers are white. *Pleurospermum candollei* is 30- 40 cm long herb and grows in Himalaya and these two collectively are claimed by some workers as 'Mrita Sanjeevani'. These two divine herbal plants were used for the worship of mountain god and houses of rural folk living in the valleys of Dronagiri. The tribal people of Dhouladhar hilly areas living in western Himalayan areas used to call it 'Bana' or 'Shiva'. Both the above-mentioned plants were applied to soothe body pains and to cure cerebral disorders, unconsciousness, respiratory problems, and other ailments.

### **In search of Bishalyakarani**

We have also searched the published data base for Bishalyakarani and the plants are listed in the Table 3. It shows that six plants are known as Bishalyakarani in different literature. *Barleria lupulina* Lindl (Fig 2) (Family:Acanthaceae) is a wonder plant known as Kantapabishalyakarani or Vishallakarani (www.flowersofindia.net/catalog/slides/Hophead.html,4Sep.2006).



Figure 2. *Barleria lupulina* with flowers

It has immunomodulatory (enhancing immune), and radio-protecting abilities, due to the presence of secondary metabolites and phytoactive compounds unique to the plant. Radio-protective and anti-clastogenic effects of *Barleria lupulina* Lindl. extract against  $\gamma$  (gamma)-ray (1.2 Gy) induced

Table 3. The plants known as Bishalyakani/\*red bishalyakarani/ \*\*Kata-bishalyakarani with Scientific name, family and reference

S. No.	Scientific Name	Family	Reference
1.	<i>Amaranthus tricolor</i> L. var. <i>tristis</i> (Pran)Nayar	Amaranthaceae	www.assamplants.com
2.	<i>Eupatorium triplinerve</i> Vahl	Asteraceae	www.assamplants.com
3.	<i>Eupatorium ayapana</i> Vent	Asteraceae	Biswas & Ghosh
4.	<i>Tridax procumbens</i>	Asteraceae	Panigrahi and Sahu www.ekamravan.in/medicinal_detail.htm Pal & Jain
5.	** <i>Barleria lupulina</i> Lindl.	Acanthaceae	https://sites.google.com/site/indiannamesofplants/via-species/b/barleria-lupulina www.flowersofindia.net/catalog/slides/Hophead.html 4 Sep 2006
6.	* <i>Aerva javanica</i>	Amaranthaceae	Folklore

mitotic chromosomal aberrations of laboratory mice *Mus musculus* and its effect on fish tumor induced after  $\gamma$ -irradiation (Sur, 2012). Ursolic acid from leaf extracts of *Barleria lupulina* acting as anti clastogenic and anti tumor agen (Das and Sur, 2012). In the pioneering work, Sur (2012) also isolated and identified two more compounds  $\beta$ -sitosterol and sitosterol-3-o-glucoside from leaf of *B.lupulina* by using modern technology like TLC and NMR and subsequently patented (Patent No 639/KOL/2012,dt 07-06-2012, Govt of India) on four parameters like anti-clastogenic, anti-cancer, anti-tumor and radio-protective activity of these molecules on different animal models-*Oreochromis mossambicus* (Fish), *Mus musculus* (laboratory mice) and on a wild mammal (House shrew) *Suncus murinus*. This plant may be claimed as Bishalyakarani. *Barleria lupulina* Lindl. is a popular medicinal plant distributed in mountains of southern and western India. In the work, the effect of methanolic extract of aerial parts of *B. lupulina* on CNS activity has been evaluated. The CNS activity was tested in several experimental models, in mice and rats: general behaviour, exploratory behaviour, muscle relaxant activity, conditioned avoidance response and phenobarbitone sodium-induced sleeping time tests (Suba *et al.*, 2002).

### Conclusion

After foregoing discussion concerning literature, none of proposed plants satisfy all criteria of Sanjeevini, although *S. bryopteris* is claimed by some workers as nearer to Sanjeevani, as it grows in Himalyan zone and it revives itself from extreme desiccation. This plant contains some important bioactive components that protect and help recover rat and insect cells from oxidative and ultraviolet stress. But there is no scientific work that it has ability to resurrect dead organism or unconscious animals. This plant never glows or emits light. Regarding the scientific work on the Bishalyakarani plants is very poor but Sur (2012) has done some scientific experiments on models like fish, mice and house shrew and also doing work to claim *B lupulina* as the magical Bishalyakarani plant. This review work is expected to encourage scientists /botanist to search, by extensive scientific experiments, on the Himalayan flora/or other flora for our most wanted magical plants that can satisfy Sanjeevani/Vishalyakarani as its profound medicinal properties for the benefit of mankind.

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