



## Exploring the therapeutic potential of *Gunja* (*Abrus Precatorius* Linn.): A classical semi-poisonous herbal drug

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### Abstract

**Introduction:** The formulations described in Ayurveda compendia generally contain ingredients of herbal, herbo-mineral, metal or animal in origin. *Abrus precatorius* (*Gunja*) is a well-known herbal semi-poisonous plant anticipates contain various medicinal properties used in various formulations after proper purification process. These formulations are indicated for preservation of health and cure of variety of diseases conditions.

**Aim and Objective:** Description of *Abrus* and its formulations can be traced in various Ayurveda texts including *Nighantus*. However, a single hand information regarding formulations of *Gunja*, is not available. Hence, attempt is made in the present paper to gather therapeutic, pharmacological and ehnomedicinal evidences of classical formulations of *Abrus precatorius*.

**Material & Method:** In the present study, relevant references of various formulations containing *Gunja* were reviewed through eleven Ayurveda texts including *Rasashastra & Bhaishajya Kalpana*. Therapeutic efficacy of *Gunja* is discussed on the basis of available compiled data.

**Observation and Results:** In present review, total 109 formulations were found in Ayurveda texts indicated in internal and external applications and used in various forms like *Avaleha*, *Taila*, *Ghrita*, *Lepa*, *Vati* etc. These various forms are used in treating skin diseases, alopecia, rheumatoid arthritis, hair problems etc. The maximum formulations (total 68) are described in the form of *Lepa* meant for external application. In ethnomedicine, it is a drug of choice in treatment of many diseases and proved remarkable pharmacological activities.

**Conclusion:** *Abrus precatorius* have high therapeutic potential if used judiciously after due purification process. This study may help as guideline to researchers for planning their pharmaceutical, pre-clinical or clinical studies.

**Keywords:** *Abrus precatorius*, herbal, herbo-mineral, formulations, therapeutic potential

### Introduction

Ayurveda is the science of life which deals with maintenance of healthy persons and cure of ailing humanity as its main objective <sup>[1]</sup>. To achieve this goal Ayurveda offered *Bhaishajya* (medicine) as a weapon to conquer the untreatable diseases. *Bhaishajya* is further modified in to different formulations to compete with need of all time availability, simple administration, palatability and effectiveness <sup>[2]</sup>. This is the reason herbal products are gaining momentum and majority of the world's population is dependent on herbal medicines as a part of their primary health care. Majority of the patients and traditional healers use medicinal plants in the form of powders, decoctions, paste, oil or poultice as the most common form of medication for curing the diseases <sup>[3]</sup>.

Formulations with single herb, combination of herbs, or combination of herbs and minerals have been used from ancient days to treat a wide range of human diseases. Poisonous and semi poisonous drugs are also widely used in the formulations successfully after their proper purification (*Shodhana*). *Abrus precatorius* commonly known as *Gunja* is classified under semi poisonous drug. *Abrus* is a glabrous wiry climber and common in tropical and subtropical countries. *Abrus* is from Greek word meaning graceful in

allusion to the flowers, *precatorius* means rosery beads <sup>[4]</sup>. The leaves are up to 10 cm long. The seeds are ovoid, globular, 7 mm in length, 5 mm in diameter, hard, smooth and shining with two distinct colors. The flowering season is July to September. It is common in hedges and bushes <sup>[5]</sup>. *Acharya Charaka* mentioned this drug in *Vajikaran Adhyay* and *Acharya Sushrut* classified *Gunja* under *Moola Visha*. In *Bhavprakash Nighantu*, it is mentioned under *Guduchyadi Varga*. *Yogratnakar* and other *Rasashastra* text mentioned it under *Upavisha* <sup>[6, 7]</sup>. Three varieties of *Gunja* are mentioned i.e. *Shweta*, *Rakta* and *Krishna*, out of this *Shweta* is considered as highly toxic <sup>[8]</sup>. Several synonyms are mentioned in Ayurvedic and other contemporary texts. The *Rakta Gunja* synonyms are *Gunja*, *Chudamani*, *Tamra*, *Kakachincha*, *Kakantika*, and *Ratti* whereas the synonyms of *Shweta Gunja* are *Shweta Kakadani*, *Durmukha Chakrika*, *Chakrashalya*, *Uchchata*, *Angarvalli* and *Billabhush* <sup>[9]</sup>. There is a difference of opinion among Ayurveda seers regarding the identification of drug *Gunja* based on synonyms. Some controversial synonyms are *Uchchata*, *Kakadani*, *Chudamani* and *Swetakamboji* does not reveal any meaning of *Gunja* <sup>[10, 12]</sup>. Though it is classified under semi-poisonous group, all the texts have described its therapeutic applications after purification in

various disease conditions through variety of formulations. Hence in the present paper attempt has been made to review all the classical formulations described in Ayurveda compendia and identify its therapeutic potential in various diseases.

### Materials and Method

For the present study, review has been done from *Brihatrayi* i.e. *Charak Samhita*, *Sushrut Samhita* and *Ashtang Hriday*. Various other *Rasashastra* and *Bhaishajya Kalpana* texts such as *Yogratnakar*, *Chakradatta*, *Vangasen Samhita*, *Rastarangini*, *Rasendrachintamani*, *Rasaratnasammuchchay*, *Raskamdhenu*, *Bhaishajya Ratnavali* and *Bharat Bhashajya Ratnakar* were also reviewed and the formulations of *Gunja* were compiled. Percentage of *Gunja* as an ingredient is calculated in each formulation. The formulations of *Gunja* which are in medicated oil forms involves sub steps such as mixing of bolus of one or more herbs, decoction of one or more herbs and either water or any other liquid media. Therefore in such case, percentages of *Gunja* are calculated by considering total amount of herbs used for preparation of bolus as well as for preparation of decoction. Liquid media

and prepared decoction are excluded from counting because both get evaporated during preparation of oil. If quantity of *Gunja* is mentioned in the formulation then the percentage of *Gunja*/100 ml oil in that formulation is calculated by multiplying quantity of *Gunja* by 100 and dividing it by total quantity of oil mentioned in classical text. If quantity of *Gunja* is not mentioned, then it is calculated by dividing total quantity of ingredients by total number of ingredients. Later percentages of *Gunja* are drawn by following aforementioned calculation. Percentage of *Gunja* is not calculated for those formulations where multiple processes are involved.

### Observation and Result

Total 109 formulations of *Gunja* were found after reviewing all the eleven Ayurveda texts. Most number of formulations (Total 54) is found in *Bharat Bhaishajya Ratnakar*. All formulations are described with their name, part used, forms of formulation, used in the form of internal or external, indications and textual references. Percentage of *Gunja* present in particular formulation is also calculated as shown in table no 1.

**Table 1:** Formulations of *Gunja*

S.N.	Name of formulation	Part used	Type of Preparation	% of <i>Gunja</i>	Internal / External use	Indications	References
1	<i>Kanakksiri Taila</i>	Seed	<i>Taila</i>	0.47	External	<i>Kushta, Kandu Krimi</i>	Ch chi 7/115 p 202
2	<i>Prapaundarikadi dhumapan</i>	Seed	<i>Dhoom paan</i>	11.11	Internal	<i>Kasa</i>	Ch chi 18/72 p 431
3	<i>Shargeshtadi Churna</i>	Seed	<i>Churna</i>	11.11	External	<i>Urustambha</i>	Ch chi 27/30 P 614
4	<i>Gunja Lepa</i>	Seed	<i>Lepa</i>	100	External	<i>Indralupta</i>	Su chi 20/25 P 331
5	<i>Visrpahar Yog (Lepa)</i>	Seed	<i>Lepa</i>	9.09	External	<i>Kaphaj visarp</i>	Su chi 17/15 P.304
6	<i>Arshanashaka Lepa</i>	Seed	<i>Lepa</i>	25	External	<i>Arsha</i>	A.H.Chi 8/20 P 660
7	<i>Bhallatakadi Lepa</i>	Seed	<i>Lepa</i>	5.27	External	<i>Kushta, Kilasa</i>	A.H. Chi20/16 P 799
8	<i>Galgandhar Yog</i>	Seed	<i>Lepa</i>	12.5	External	<i>Khaphaj Galgand</i>	A.H.U.22/69-70, P.1043
9	<i>Indralupta Yog</i>	Root	<i>Lepa</i>	50	External	<i>Indralupta</i>	A.H.U. 24/28 P .1060
10	<i>Ucchata &amp;shatavari Yog</i>	Seed	<i>Churna</i>	50	Internal	<i>Viryavridhhi</i>	A.H.U. 40/32, P 1210
11	<i>Indralupthar Lepa</i>	Root, Seed	<i>Lepa</i>	100	External	<i>Indralupta</i>	YR, P 279
12	<i>Gunjaphal Lepa</i>	Seed	<i>Lepa</i>	100	External	<i>Avabahuk, Vishwachi, Gridrasi</i>	YR, p 544
13	<i>Gunjamuladya Anjan</i>	Root	<i>Anjan</i>	50	External	<i>Netraroga, Timir</i>	YR, p 369
14	<i>Mahalakshmi narayan Taila</i>	Seed	<i>Taila</i>	--	External	<i>Vatvyadhi</i>	YR, p536
15	<i>Bhallatakavaleha</i>	Seed	<i>Avaleha</i>	--	Internal	<i>Kushta, Krimi</i>	YR, p 223
16	<i>Pratham Gunjadya Taila</i>	Seed	<i>Taila</i>	4.76	External	<i>Kandu, Kushta, Darunak</i>	RT 24/457-59 p 731
17	<i>Dvitiy Gunjadya Taila</i>	Root, Seed	<i>Taila</i>	25	External	<i>Gandamala, Shotha, Swarbhed</i>	RT 24/460-63 P 732
18	<i>Gunjajivan Ras</i>	Seed	<i>Raskalpa</i>	24.99	Internal	<i>Madanoddipn, Balakarak</i>	RT 24/464-66 P 73
19	<i>Gujabhadra Ras</i>	Seed	<i>Raskalpa</i>	18.18	Internal	<i>Urustambha</i>	RT 24/467-70 P 73
20	<i>Bhasmasuta</i>	Leaves	<i>Raskalpa</i>	2.38	Internal	<i>Agnimandya</i>	Rs Ch 9/29-38 p 220
21	<i>Gunjagarbha Ras</i>	Seed	<i>Raskalpa</i>	6.45	Internal	<i>Hridrg</i>	Rs Ch 9/6-8 p 287

22	<i>Shwitrahar Lepa</i>	Seed	<i>Lepa</i>	50	External	<i>Shwita</i>	Rs Ch 9/26 P 375
23	<i>Shuddhimartand Ras</i>	Seed	<i>Raskalpa</i>	33.33	Internal	<i>Kushta</i>	RsCh 9/145 p 378
24	<i>Kushtaghna Taila</i>	Seed	<i>Taila</i>	7.40	External	<i>Kushta</i>	RsK c 41/555-60 p 209
25	<i>Udayaditya Ras</i>	Leaves	<i>Raskalpa</i>	16.66	External	<i>Kushta</i>	S.S...ma 12/191- 93, p426
26	<i>Gunja Lepa</i>	Seed	<i>Lepa</i>	100	External	<i>Avbahuk Gridrasi Vatrog</i>	Su. U 11/101- 102, p551
27	<i>Navneet Yog</i>	Seed	<i>Lepa</i>	11.11	External	<i>Karnarog</i>	CD, p, 342
28	<i>Bhallatakadi Lepa</i>	Seed	<i>Lepa</i>	6.66	External	<i>Kushta, Kilas, Arsha</i>	CD, p 283
29	<i>Gunjadya Taila</i>	Seed	<i>Taila</i>	12.	External	<i>Apachi</i>	CD, P 248
30	<i>Kantakaryadi Lepa</i>	Root	<i>Lepa</i>	100	External	<i>Indralupta</i>	BBR1 p-274
31	<i>Kakajanghadi Vati</i>	Root	<i>Vati</i>	25	Internal	<i>Swarbhed</i>	BBR 1 p-224
32	<i>Kharjuradi Yog</i>	Seed	<i>Ghruta</i>	16.66	Internal	<i>Shirorog</i>	BBR 1, p 333
33	<i>Karpasadi Lepa</i>	Seed	<i>Lepa</i>	33.33	External	<i>Sidhma</i>	BBR 1 p 275
34	<i>Gunjasuran Lepa (Varti)</i>	Seed	<i>Lepa</i>	33.33	External	<i>Arsha</i>	BBR 2,p 71
35	<i>Chinchadyanjanam</i>	Root	<i>Anjana</i>	25	External	<i>Netrarog, Arma Arjuna, Timira</i>	BBR, p 194
36	<i>Gunja Tailam</i>	Seed	<i>Taila</i>	5	External	<i>Keshya,</i>	BBR 2, p 60
37	<i>Gunja Tailam</i>	Seed	<i>Taila</i>	2.2	External	<i>Shirorog</i>	BBR 2, p 61
38	<i>Gunja Tailam</i>	Seed	<i>Taila</i>	25	External	<i>Shirorog (Arunshika)</i>	BBR 2, p 61
39	<i>Gunja Tailam</i>	Root Seed	<i>Taila</i>	25	External	<i>Gandamaala</i>	BBR 2, p 61
40	<i>Gunjadya Tailam</i>	Root	<i>Taila</i>	5	External	<i>Galganda, Arbuda</i>	BBR 2, p 61
41	<i>Gunjaphal Tailam</i>	Seed	<i>Taila</i>	25	External	<i>Karnarog</i>	BBR 2, p 62
42	<i>Gunjadi Lepa</i>	Seed	<i>Lepa</i>	100	External	<i>Kushta, Dadru</i>	BBR 2, p 70
43	<i>Gunjadi Lepa</i>	Seed	<i>Lepa</i>	20	External	<i>Shwita</i>	BBR 2, p 70
44	<i>Gunjadi Lepa</i>	Seed	<i>Lepa</i>	5.26	External	<i>kushta</i>	BBR2, p 70
45	<i>Gunjapatradi Lepa</i>	Leaves	<i>Lepa</i>	20	External	<i>Keshya</i>	BBR 2,p 71
46	<i>Gunjadi Varti</i>	Seed	<i>Varti</i>	33.33	External	<i>Arsha</i>	BBR 2, p 128
47	<i>Gunja Lepa</i>	Seed	<i>Lepa</i>	25	External	<i>Keshya</i>	BBR 2, p 71
48	<i>Gunjagarbha Rasayanam</i>	Seed	<i>Raskalpa</i>	6.6	Internal	<i>Urustamba</i>	BBR 2, p 107
49	<i>Gunjadimulyog</i>	Root	<i>Kalka</i>	100	External	<i>Krumidanta</i>	BBR 2, p 128
50	<i>GunjadiVarti</i>	Seed	<i>Varti</i>	33.33	External	<i>Arsha</i>	BBR 2,p 128
51	<i>Triphaladya Ghrut</i>	Seed	<i>Ghruta</i>	1.47	Internal	<i>Kushta</i>	BBR 2, p 371
52	<i>Triphaladi lepa</i>	Seed	<i>Lepa</i>	14.28	External	<i>Shwitra</i>	BBR 2,p 372
53	<i>Bhallatakadi Taila 2</i>	Seed	<i>Taila</i>	0.80	External	<i>Kushta</i>	BBR 3,p 647
54	<i>Dvipanchmuladya Tailam</i>	Root	<i>Taila</i>	0.89	External Internal	<i>Urusthama, Vatrakta, Shlipad</i>	BBR 3,P80
55	<i>Nili Ghritam</i>	Seed	<i>Ghruta</i>	33.33	External Internal	<i>Shwitra, pama, Kushtha</i>	BBR 3,P 192
56	<i>Paniya Vatika2</i>	Seed	<i>Vati</i>	--	Internal	<i>Jwara,Shwasa</i>	BBR 3, p 449
57	<i>Bhallatakadi Lepa</i>	Seed	<i>Lepa</i>	5	External	<i>Kushta Kilasa</i>	BBR 3, p 655
58	<i>Bhrungrajadi Lepa</i>	Leaves	<i>Lepa</i>	25	External	<i>Prameh Pidika</i>	BBR 3 p 656
59	<i>Bhasmamruta Ras</i>	Seed	<i>Raskalpa</i>	--	Internal	<i>Sannipat Jwara</i>	BBR 3 p 667
60	<i>Rajavartavaleh</i>	Seed	<i>Avaleha</i>	--	Internal	<i>Prameh</i>	BBR 4, p 447
61	<i>Vikankatadi Lepa</i>	Root	<i>Lepa</i>	10	External	<i>Kaphaj Granthi</i>	BBR 4,p 688
62	<i>Rastaleshwar Ras</i>	Seed	<i>Raskalpa</i>	9.09	Internal	<i>Kushta, Vicharchika</i>	BBR 4,p 427
63	<i>Mahanila Ghruta 1</i>	Seed	<i>Ghruta</i>	37.5	External	<i>Shwitra</i>	BBR 4, p 78
64	<i>Mahanila Ghruta 2</i>	Seed	<i>Ghruta</i>	12.5	External	<i>Kushta, Bhagandara</i>	BBR 4,p 79
65	<i>Mahanila Ghruta 3</i>	Seed	<i>Ghruta</i>	15.25	External	<i>Kushta,Arsha</i>	BBR 4,p 80
66	<i>Manshiladya Tailam</i>	Seed	<i>Taila</i>	0.60	External	<i>Kushta,Krimi</i>	BBR 4, p96
67	<i>Kakdanyadi Kshara</i>	Seed	<i>Kshara</i>	--	External	<i>Slipad, Aruchi, Gandmala</i>	BBR 5, p 702
68	<i>Shwetari Ras</i>	Seed	<i>Raskalpa</i>	10	Internal	<i>Shwet kushta</i>	BBR 5, p 169
69	<i>Haridradi Taila no 5</i>	Seed	<i>Taila</i>	0.60	External	<i>Kushta, Pama</i>	BBR 5,p 465
70	<i>Kushtari Ras</i>	Seed	<i>Raskalpa</i>	11.11	Internal	<i>Kushta</i>	BBR 5, p 466
71	<i>Shwitrebhasinho Ras</i>	Seed	<i>Raskalpa</i>	20	Internal	<i>Shwitra</i>	BBR 5, p 167
72	<i>Kshar Gritam</i>	Seed	<i>Ghruta</i>	6.94	External	<i>Kshudrarg Chippa, Sidhma</i>	BBR 5, p 531
73	<i>Avaguljadi Lepa</i>	Seed	<i>Lepa</i>	2.46	External	<i>Kushta</i>	BBR 5, p584
74	<i>Abhrak Rasayana</i>	Root	<i>Raskalpa</i>	--	Internal	<i>Rasayan</i>	BBR 5, p 611
75	<i>Kakajanghadinilpushpa yog</i>	Seed	<i>Ksheer</i>	100	Internal	<i>Yakshma</i>	BBR 5, p 702
76	<i>Kakganghadya Churna</i>	Seed	<i>Churna</i>	7.69	Internal	<i>Vataj grahani</i>	BBR 5, p 702
77	<i>Kakajangha Tailam</i>	Root	<i>Taila</i>	50	Internal	<i>Karnarog</i>	BBR 5, p727
78	<i>Kakadanyadi Taila</i>	Root	<i>Taila</i>	1.25	Internal External	<i>Apachi</i>	BBR 5, p 727
79	<i>Kakajanghadi Lepa</i>	Seed	<i>Lepa</i>	16.66	External	<i>Visarpa</i>	BBR 5, p 741
80	<i>Kakajangha Lepa</i>	Seed	<i>Lepa</i>	100	External	<i>Vrana</i>	BBR 5, p 741
81	<i>Kakadanimulyog</i>	Root	<i>Lepa</i>	100	External Internal	<i>Mandal Sarpavisha</i>	BBR 5, p 741
82	<i>Kantapashanadi Yog</i>	Seed	<i>Lepa</i>	20	External	<i>Keshya</i>	BBR 5, p 742

83	<i>Sannipatbhairav ras</i>	Panchang	Raskalpa	Bhavana	Internal	Jwara	BBR5, p 307
84	<i>Mehakalanalo Ras</i>	Root	Raskalpa	Anupanan	Internal	Prameh	BR, P 727
85	<i>Panchanan Ghruta</i>	Leaves	Ghruta	6.25	Internal	Shlipad	BR, P 838
86	<i>Panchanan Tailam</i>	Leaves	Taila	6.25	Internal External	Shlipad	BR, P 838
87	<i>Snuhyadi Tailam</i>	Root	Taila	4.62	External	Indralupta	BR, P 959
88	<i>Anandbhairav Ras</i>	Root	Vati	Anupana	Internal	Prameh	BR, P 709
89	<i>Sarivadi Vati</i>	Root	Vati	bhavana	Internal	Karnarog, Unmad Apasmar	BR, P 666
90	<i>Gunjadya Taila</i>	Root	Taila	3.16	External	Apachi, Arsha, Nadivran	BR, P 584
91	<i>Mahamayur Gruta</i>	Seed	Ghruta	3.12	Internal	Shirorog, Kasa, Shwas	VS, P 648
92	<i>Gunjadi Taila</i>	Root, Seed	Taila	50	External	Gandamala	VS, P 441
93	<i>Ashtamangal Gruta</i>	Seed	Ghruta	6.25	Internal	Madhur Vani	VS, P 700
94	<i>Mehahar Ras</i>	Panchanga	Raskalpa	--	Internal	Prameh	RRS, P 203
95	<i>Vishkalp</i>	Seed	Lepa	16.66	External	Shwitra	RRS, P 393
96	<i>Kasisbandha Ras</i>	Root, Seed	Raskalpa	5	Internal	Prameh	RRS, P390
97	<i>Sarvangsundar ras</i>	Seed	Raskalpa	4.17	Internal	Gulma, shul, pandu	RRS, P411
98	<i>Purnachandra Ras 1</i>	Root	Raskalpa	Bhavana	Internal	Shukravardhak	RRS, P617
99	<i>Lakshadi Tailam</i>	Seed	Taila	1	External	Shwitra	RRS, P674
100	<i>Vishakalpa</i>	Root	Kwatha	80	Internal	Kushtha	RRS, P660
101	<i>Vishakalap</i>	Seed	Lepa	17	External	Kushtha	RRS, P 661
102	<i>Vishakalpa</i>	Seed	Lepa	4.5	External	Apachi, Shlipada	RRS, P 666
103	<i>Vishakalpa</i>	Leave	Churna	Bhavana	Internal	Rasayana	RRS, P668
104	<i>Vishakalpa</i>	Seed	Taila	2,93	External	Apachi	RRS, P 668
105	<i>Indraluptahar Taila</i>	Seed	Taila	3.6	External	Indralupta	RRS, P665
106	<i>Gunjadiudvartan</i>	Seed	Lepa	5.55	External	Pama, Vicharchika, Kandu	RRS, P482
107	<i>Gandhakadi pottali Ras2</i>	Seed	Rasakalpa	--	Internal	Vali Palita	RRS, P405
108	<i>Gunjadilepa</i>	Seed	Lepa	22 in	External	Apachi	RRS, P 265
109	<i>Argvadhadi Taila</i>	Seed	Taila	1.25	External	Sidhma, Udumbr Kushtha	RRS, P 481

Ch -Charak Samhita, Su-Sushrut Samhita, AH-Ashtang Hriday, YR-Yogratnakar, RT-Rastarangini, Rs ch-Rasendrachimantani, RsK-Raskamdheni, BR-Bhaishajya Ratnavali, BBR-Bharat Bhashajya Ratnakar, CD-Chakradatta, VS-Vangasen Samhita, SS -Sharangdhar Samhita., RRS-Rasratnasamuchhaya

## Discussion

In Ayurveda texts, the etymology of *Visha* is described as the substance which causes distress or sadness (*Vishannatva*) in the body. Further *Visha* is defined as a substance which proves destructive to life. The substance which is less virulence than *Visha* is termed as *Upvisha* (semi-poisonous) drug. According to *Acharya Charaka* any drug on the earth including poison can be used as a medicine provided that it is administered properly and judiciously.

*Abrus precatorius* (Linn.) is semi-poisonous herbal drug commonly known as *Gunja* and possesses slender climbing wine bearing compound leaves. Based on the Morphology, action and usage it is called as *Gunja* (making rattling sound when ripe), *Angarvalli* (looking fiery), *Kaka-chincha* (resembles *Tamrind* leaves) *Krishnala* (seed with black eye), *Chakrashalya* (climbing in circular way) *Tulabeej* (unit of measurement), *Bahuveerya* (it is potent drug). Based upon the colour of the seeds, three types of *Gunja* have been described *i. e.* *Rakta* (red), *Shweta* (white) and *Krishna* (black). Completely white coloured seeds are rare [13]. According to *Rasatarangini* *Gunja* is a member of *Mitrapanchak* or *Dravakagana* and used in extraction of metals and tests of *Bhasma* [14]. The *Abrus* seeds are used for weights since time immemorial, Weight of one *Gunja* is considered equal to three *Yava i.e.* 125 mg [15, 16]. Leaves of *A. precatorius* are laxative, expectorant and aphrodisiac medicines and are used in urticaria, eczema, stomatitis, conjunctivitis, alopecia areata, migraine, lymphomas/leukemia and dysmenorrhoea. It is used for internal administration to treat various diseases as *Kushtha* (skin diseases) [17, 18], alopecia, *Arsha* (piles) [19, 21]. This is included in schedule 'E' of the drug act. *Gunja* seeds have property of curing hair, eye and respiratory disorders. Seeds of *Gunja* are good for *shukrajanan* (substances which

enhances semen / sperm) [22]. Root of *Gunja* is used in leukoderma, nervous disorders, rheumatism, sore throat and dry cough [23, 24].

According to Ayurveda, seeds of *Gunja* are poisonous and used for medicinal purpose. Many Phyto-chemicals are identified in *Gunja*, they are in seeds abrine, abrusine, glucoside haemagglutin, abraline, trigonell and choline; in Root precol, abrol, abranine glycyrrhizine, and precanine; in leaves pintol and glycyrrhizine. Abrin is a main toxic constituent which produces ill effects. *Abrus precatorius* is contraindicated in gastric and peptic ulcer because it is known to develop hemorrhages in GI tract if chewed and swallowed and may prove fatal. Prolonged use of *Abrus* seeds can lead to anemia and increases the white blood cell count tremendously [25]. In general practice, Ayurveda physicians use root, seeds and leaves of *Abrus precatorius*. According to modern science all parts of *Gunja* are considered as poisonous [26]. In Ayurveda *Shodhana Samskar* (purification) of *Gunja* is mentioned. It is very important procedure to avoid the hazards effect of the toxic principle present in the seeds. Moreover, it is proved that *shodhana* decreases the percentage of toxic protein, Abrin [27]. If used without purification it causes vomiting and diarrhoea. *Gunja* seeds are purified by boiling the seeds in *Dolayantra* containing cow's milk or *Kanji* for 6 hrs and then washed with hot water [28, 29]. Purification process helps to remove the toxic properties and thus enhances the potency and efficacy of the drug [30, 31]. Though the western world believes it as a potential toxic drug but Ayurveda stresses the medicinal value of this drug. The purified seeds kindle sexuality. Seeds are useful in *Urustambha* (gripping of the thighs) and improve strength. The leaves have anti-inflammatory activity and useful in *Amavata* (rheumatoid arthritis). The root of this plant is sweet in taste, expels *Kapha*, clears sore throat, vomiting, cough, dysurea, acts as

an antidote to poisons and improves taste- perception and strength thus identical in properties to roots of *Yastimadhu*. Hence it is used as a substitute to *Yastimadhu* [32].

*Gunja* has been used as an ingredient in 109 formulations (Table no 1). It is used both internally and externally in various dosage forms such as *Kalka* (paste), *Churna* (powder), *Taila* (oil), *Ghruta*, *Dhuma varti* (nasal inhalation), *Lepa* (paste), *Raskalpas* (herbomineral formulation), *Vati* (tablet), *kwatha* (decoction), *Avaleha* (medicated semisolid preparations), *Anjana*(collyrium), *Varti* (suppository) and *Kshara* (alkaline preparation). Among them 68 formulations are used for external administration, 36 formulations in internal application and 5 formulations used in both roots (Graph1). Maximum percentage of *Gunja* is observed in *Gunjaphal lepa*, *Gunja Lepa* and *Indraluptahar Lepa* (100%). Lowest proportion of *Gunja* is found in *Kanakkhsiri Taila* (0.47 %). In the remaining formulations percentage of *Gunja* ranges from 0.60% to 50 %. It is indicated that *Gunja* can be used from smallest to highest dose for therapeutic purpose. *Gunja* is also used as *Bhavana* or trituration process in the formulations such as *Mehahar Ras*, *Sannipatbhairav Ras*, *Purnchandra Ras*, *Vishakalp*, *Abhraka Rasayan* and *Sarivadi Vati*. Due to trituration Particle size reduced and the surface area of drug increased. This process also helps to reduce the dose of the formulation and makes it more bio-available [33]. *Shweta Gunja* is used as an ingredient in *Kanakakshiri Taila*, *Ashtamangal Gruta*, *Rajavartavaleha*, *Kasisbandha Ras*, *Mahanili Ghruta*, *Nili Ghruta* and *Dvipanchmuladya Tailam* while both type of *Gunja* i. e. *Shweta & Rakta* are used in *Kakadnyadi Kshara*.

### Pharmacological activities of *Abrus precatorius*

Incredible research work, in vivo and in vitro has been conducted on various extracts of seeds of *A. precatorius* and it show remarkable pharmacological activities. Research on aqueous extract of seed powder of *Gunja* showed spermicidal activity in male albino rats and the pet ether extract of seed oil of *Gunja* possess excellent anti-lice activity [34, 35]. Petroleum ether extract from aerial parts of *Abrus precatorious* at different concentration showed neuroprotective effect when given orally in rats [36]. The plant part extracts also produced anti-diabetic [37] anti-viral [38] neuromuscular, anti-epileptic anti-convulsant [39], anti-helminthic [40], diuretic [41] anti-microbial [42, 43], anti-inflammatory [44, 45], anti-arthritis and analgesic [46], anti-cancer [47, 48], anti-fertility [49, 51], anti-spermatogenic [52, 54], anti-malarial [55], wound healing activity [56], anti-asthmatics [57], anti-cataract [58], Antidiarrheal [59], anti-spasmodic [60] cytotoxicity and antitumor [61] activity in various concentrations.

### Uses of *Abrus precatorius* in ethnomedicine

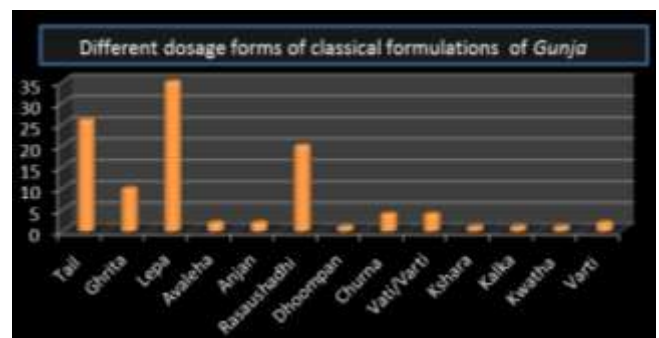
*Abrus precatorious* is having the rich tradition of using the drug in ethnomedicine. Diverse ethnomedicinal survey studies conducted in various parts revealed that *Gunja* is the drug of choice of traditional healers in the treatment of different disease conditions.

*A. precatorius* is used with other ingredients to treat leucoderma. The leaves of *A. precatorius* are used to treat cough, fever and cold [62]. The root paste is used to cure

jaundice. Paste is also given orally as to cure abdominal pain, tumors and for abortion [63]. In a snake bite freshly collected root is chewed [64]. In bronchitis and hepatitis decoction of root is used. Paste of leaves and seeds is applied on scalp for treating graying of hair. Seeds powder is used to cure worm infestation. Various African tribes use seeds powder as oral contraceptives [65]. Decoction of fresh root is advised orally as an anti-conversant and anti-malarial [66]. Fresh leaves are chewed to cure mouth ulcers [67]. In skin diseases the paste of leaves is applied twice daily for one week. Eyes are washed with decoction of leaves to cure the poor eyesight [68]. Leaf juice is mixed with coconut oil and applied over the painful swellings of the body [69]. Fresh leaf juice is taken 5 ml twice a day for 3 days to cure dry cough [70]. Fresh root paste is applied on bite site in scorpion bite and swelling [71].

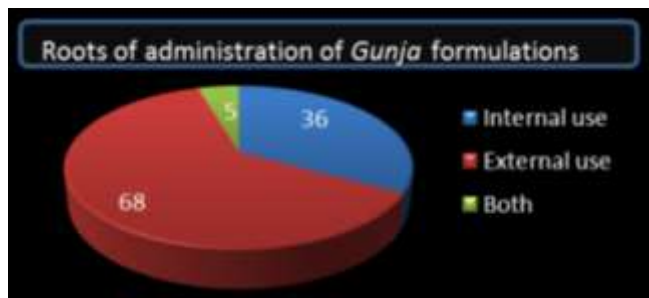
### Efficacy studies on Formulations of *Abrus precatorius*

It is reported that the seeds are administered internally in affections of the nervous system and their paste is applied locally in sciatica, stiffness of shoulder joint and paralysis. Seeds of red variety of *A. precatorius* when applied in patients of arthritis proved to be efficacious [72]. *Gunjadya taila* is significantly effective to cure *Darunak* when applied locally [73]. In another study, *Gunja taila* massage on scalp with oral drug showed remarkable results (69%) in hair fall [74]. The efficacy studies on hair growth and antibacterial effect of the *Sodhita Guñjā* show significant result [75]. Application of *Gunja* paste on Alopecia areata for 5- 10 minutes followed by application of *Gunjadya taila* delivered satisfactory results [76].



**Graph 1:** Total no of different dosage forms of classical formulation of *Gunja*

Most of the *Gunja* formulations are advised in *Lepa* form (68 formulations). The powdered drugs are converted into paste by adding specified amount of liquid. This paste is to be applied externally on skin and is termed as *Lepa* [77]. In Ayurveda, the skin is considered as the protective and the largest sensory organ of the body that reflects the health of the individuals [78]. *Vishdravya* have specific properties such as *Sukshma* (enter in cellular parts), *Vyavayi* (increase the permeability of every body tissue) which are responsible for affecting all three *Doshas*, seven *Dhatus* and three *Malas*. Due to its *Apaki* property (get absorbed without first pass metabolism) it needs not to undergo digestion before absorption. These properties are attributed in *Lepa* therapy for treating the skin diseases [79].



**Graph 2:** Internal and external use of the formulations of *Gunja*.

### Conclusion

The extensive literature survey revealed that *Abrus precatorius* L. is a distinctive medicinal plant available abundantly and having diverse pharmacological properties. With 109 formulations in the form of Oil, Tablets, *Lep*, *Churna*, *Avaleha*, Decoction, *Rasakalpa* etc. are indicated in varied diseases conditions. This versatile medicinal plant is attributed with a range of chemical compounds, which are accountable for the various activities. A proper knowledge is essential regarding its identification, varieties, pharmacological and toxic properties, purification methods and judicious use. Hence extensive investigation is needed to exploit its therapeutic utility to combat diseases. To achieve good therapeutic effects of this drug, more evidence based studies are needed to be conducted so that this wonder drug with diverse therapeutic activities can be put to human use.

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