



Review Article

MANJISTHA (*RUBIA CORDIFOLIA*) AS COSMECEUTICAL REMEDY FOR PREVENTION OF STRIAE GRAVIDARUM

Sarita Verma^{1*}, D. C. Singh², Ritu Singh¹, Rupesh Kumar Sanger¹

*¹M.D.Scholar, ²Professor and H.O.D, P.G. Dept. of Dravyaguna, Rishikul Campus Haridwar, Uttrakhand Ayurveda University, Uttrakhand, India.

ABSTRACT

Cosmetics have important place in every women's life since ancient times. Women are more concern about their look during pregnancy as 90% cases develop striae marks on abdomen, breast and thighs or scratch marks due to itching make their look ugly. But there is a difference between cosmetic and cosmeceutical products which restrict sell of cosmetic without medical prescription if it contains ingredients that can penetrate or change the functioning of the skin. Cosmeceuticals are serving as a bridge between personal care products and pharmaceuticals. *Manjistha* can play a very good role in this burning issue of itching and striae marks due to their medicinal properties. *Manjistha* as remedy can prevent burning, itching and other fungal or bacterial infection and promotes skin healing by local action on skin and promotes collagen formation due to property of *Ropana- Sothahar. Kandughana* and *Vishghana* properties shows antiallergic action, anti bacterial, antifungal action actions prevents skin from secondary infection of skin caused due to itching. *Pittashamak* property pacify alleviated *Dosha* and *Varnya* property promotes skin texture, colour and luster. *Manjistha* can acts as skin protective drug which is used in Striae gravidarum to relief basic symptom of hypopigmentation, itching burning and maintains skin luster so that drug can be used in cosmeceutical industry for prevention of striae gravidarum.

KEYWORDS: *Manjistha*, Cosmetic, Cosmeceutics, Striae gravidarum (*Kikkisa*).

INTRODUCTION

Nature bestowed us with remedy for every problem and Ayurveda being an oldest healing science enriched with various medicinal herbs for management of different disorders by external and internal uses. Ayurveda can offer a smart strategy for new drug discovery. Strategic options based on ethano-pharmacology, reverse pharmacology and traditional medicine offers a good base for alternate natural product drug discovery. Ayurvedic cosmeceuticals dates back to the Indus valley civilization and it is now gaining importance in the beautification and to cure skin ailments. Cosmetics have important place in every women's life since ancient times. Women are more concern about their look during pregnancy as 90% cases develop striae marks on abdomen, breast and thighs or scratch marks due to itching make their look ugly. It is said that healthy glowing skin is indicator of healthy mind. It is hard sometimes to use any synthetic cosmetic during pregnancy. But there is a difference between cosmetic and cosmeceutical products which restrict its sell without medical prescription if it contains ingredients that can penetrate or change the functioning of the skin. Cosmetics assist the beauty of a lady by which she gets mentally healthy status and remain confident.^(1, 2, 3)

Cosmeceuticals is the combination of "cosmetic" and "pharmaceutics" and defined as cosmetic-pharmaceutical hybrids intended to enhance health and beauty through ingredients that influence the skin's biological texture and function. Cosmeceuticals are serving as a bridge between personal care products and

pharmaceuticals. Cosmeceuticals are the fastest growing segment in skin care market in present era. But there is no promising treatment for striae gravidarum in market of cosmetic and cosmeceutical.⁽⁴⁾

Then in this regard, society look towards Ayurveda to develop better and safer remedy for these trouble causing striae during pregnancy. *Manjistha* can play a very good role in this burning issue of striae marks and itching due to their medicinal properties. *Manjistha* can prevent Burning, itching and other fungal or bacterial infection and promotes skin healing by local action on skin and promotes collagen formation. Due to Property of *Ropana- sothahar*, promotes wound healing and have local anti-inflammatory action helps in odema caused due to itching. *Kandughana* and *Vishghana* properties shows antiallergic action, anti bacterial, antifungal action actions prevents skin from secondary infection of skin due to itching. *Pittashamak* and *Varnya* property promotes skin texture, colour and luster.⁽⁵⁻¹¹⁾

Manjistha (Rubia cordifolia)⁽¹²⁻¹⁴⁾

Habitat: *Rubia cordifolia* is a climbing plant growing in the North-west Himalayas, Nilgiris and other hilly districts of India (Altitude: 1500-2500m).

Botanical description: It is Perennial, prostrate or climbing herb. Stems sharply 4-angled, minutely prickly; leaves in whorle of 6-8, elliptic to ovate- cordate, long petiolate, flowers in axillary panicles of dichotomous cymes, greenish-yellow; fruits 2-celled, globose, smooth, shining, purplish-black when ripen.

Flowering and fruiting: June-October and Part used: Root and Stem mainly.

Cultivation: The tolerable thermal range for the species varies from 15-35°C in high altitude of Himalayas. The plant prefers loose, moist, light soil with some shade. As the root goes deep into soil, porous well-aerated soils are beneficial for cultivation. Irrigation is recommended at weekly intervals to maintain moist conditions in the beds. For vegetative propagation, pieces of the stem are planted directly.⁽¹⁶⁾

Varieties of *Rubia* in India ⁽¹⁷⁾

R. cordifolia is a common plant in almost all parts of south India. *R. tinctorium* is not reported from south India.

The stem pieces are adulterants, and samples derived from Sikkim and North East hills are originated from *R. Sikkimensis* Kurz. It is seen that *R. cordifolia* is a complex group, exhibiting a wide range of morphological characters.

Red color dye is present in both root and stem of *Manjistha*. *Manjistha* has been used as natural colorants and natural dye. Basically the pigments purpurin and munjistin are present in roots. In ancient times, it was used as a coloring material for clothes and described as "*Lohita varna*" like blood in color and "*lata*" as it is a creeper in nature.⁽¹⁸⁾

At the time of "*Yajnopavita Sanskar*" in Hindu dharma rituals clothes were coloured by it. However, no therapeutic uses are documented so far in these Vedic treatises.⁽¹⁹⁾

MATERIAL AND METHODS

The following are the process and eligibility criteria for the inclusion of data pertaining to this review are Data collection from various Ayurvedic treatise, text book of Ayurveda, Ayurvedic Pharmacopoeia of India, Thesis/ dissertations available. Various search engines were undertaken in Google search, Medscape, Pubmed and other relevant databases using Keywords like *Manjistha*, *Rubia cordifolia* and striae gravidarum.

LITERARY OBSERVATION

Kikkisa

Acharaya Charak while describing about formation and condition of foetus advised the Antenatal Care of *Garbhini* (pregnant women) and proper diet regime with or without medication in 7th month of pregnancy and a disease called *Kikkisa* develops during this period.

Acharya Vagbhata follows the concept of *Charak* but states that *Doshas* resides in *Hridaya* and causes itching and burning.

Acharya Bhel follows the *Charak* and *Vagbhata*.

Acharya Harita in *Harit Samhita* has not described about development of *Kikkisa*. But he has enlisted eight disorders of pregnancy and includes "*Vivarnata*" which is a symptom of *Kikkisa*.

If we look etiology behind the formation of these stretch marks termed as *Kikkisa* (*striae gravidarum*) in literatures it is stated that growing foetus in uterus displaces all the body *Doshas* upwards, thus vitiating the *Doshas*. Vitiating *Doshas* causes *Twak prasaran* (stretching of skin), *Pitta* leads to *Vidaah* and *Vaivarnya* (burning and depigmentation) and *Kaph* causes itching and the combination of these changes as *Kikkisa*. *Kikkisa* is related to *Striae gravidarum* in modern concepts.⁽²⁰⁻²³⁾

Striae gravidarum: *Striae gravidarum* generally develops in the last trimester (after 28 weeks) of pregnancy in about 90% of cases. In Modern Era, *Striae distensa* is a condition of disfiguring cutaneous condition characterized by linear smooth bands of atrophic appearing skin which occurs in areas of dermal damage produced by stretching. When the striae are present during pregnancy are called as *Striae Gravidarum*. *Striae* are seen in 90% of pregnant women due to combination of hormonal factors (e.g; adrenocortical hormones, estrogen and relaxin) along with increased lateral stress on connective tissues leads breaking of fibres. The natural evolution of striae is for the red to purple, raised wavy lesions (*striae rubra*) to fade and leave white atrophic lesions with a wrinkly surface (*striae alba*). *Striae gravidarum* are slightly depressed linear marks with varying length and breadth found in pregnancy and represent the scar tissues in the deeper layer of the cutis. *Striae gravidarum* generally develops in the last trimester (after 28 weeks) of pregnancy. Although it can also appear suddenly at the end of pregnancy due to mechanical stretching effect by growing foetus in uterus rather lacking of rapid healing rate in comparison to rapid increase in size.⁽²⁴⁻²⁷⁾

Treatment in literature⁽²⁸⁻³¹⁾

We found *Manjistha* in combination of other drugs used in Treatment of *Kikkisa*.

Like Pestled Leaves of *Nimba*, *Kola*, *Sursa* and *manjistha*. (*Ch. Sha. 8/32*, *A.S. Sha. 3/10*), Decoction of *Patol*, *Nimba*, *Manjistha* and *Surasha* (*A.H. Sha. 1/61*).

Treatment of *Kikkisa* is given only in *Charak Samhita*, *Astang Sangraha*, *Astang Hridaya* and *Bhela Samhita*.

Therapeutic Indication

Therapeutic indication for both internal and external use in skin disease described in Literature and Ayurvedic Materia Medica like *Charak Samhita* (*C.Ci*), *Sushruta Samhita* (*S.Su*, *S.Ci*, *S.Sh*), *Astang Hridaya* (*A.H.U*) and *Bhav Prakash* (*Bh.P*).

Table 1: Therapeutic Indication in Skin Disorders

Indications	Formulation	Use	Reference
<i>Kustha, Kilasa, Prameha</i>	<i>Madhuka asava</i>	Int.	<i>C.Ci-15/146</i>
<i>Vrana</i>	<i>Vrana Ropan</i>	Ext.	<i>S.SU.-37/23</i>
<i>Pitta saman varga</i>	Drugs	Int.- Ext.	<i>S.SU-40/8</i>
<i>Vrana</i>	<i>Vrana ropan tail</i>		<i>S.Ci-2/73</i>
<i>Vyanga, Neelika, Paphole, Kusthanasak, Vipadikahar</i>	<i>Ghrita paka mardan</i>	Ext.	<i>S.Ci-26/38-41</i>

<i>Pittaj roga</i>	<i>Lodhradi Asthapana Basti</i>		<i>S.Ci-38/55</i>
<i>Vyanga, Neelika</i>	<i>Manjisthadi tail</i>	Ext.	<i>A.H.U-32/31</i>
<i>Sarva kustha</i>	<i>Bhrit manjisthadi kwath</i>	Int.	<i>S.Sh.-M-2</i>
<i>Vyanga</i>	<i>Mukha kantikar lepa</i>	Ext.	<i>S.Sh.-U-11/9</i>
<i>Vyanga</i>	<i>Vyangahaar lepa</i>	Ext.	<i>S.Sh.-U-11/12</i>
<i>Kustha</i>	<i>Brihat Manjisthadi kwath</i>	Int.	<i>Bh.P-54/104-106</i>
<i>Kustha</i>	<i>Laghu manjisthadi kwath</i>	Int.	<i>Bh.P-54/99-100</i>
<i>Kustha</i>	<i>Madhyam manjisthadi kwath</i>	Int.	<i>Bh.P-54/101-103</i>

Medicinal Properties In Ayurvedic Materia Medica

Properties of Manjistha IN API⁽³²⁾ and Bhav prakash Nighantu⁽³³⁾:

Rasa : Kashya, Tikta, Madhura

Guna : Guru

Virya : Usna

Vipaka : Katu

Karma : Kaphapittasamaka, Varnya, Svarya, Visaghna, sothaghna, Kusthaghna, Pramehaghna, Vrnaya, Krimighna, Stambhana, Artavajanana, Rasayana.

Table 2: Properties of Manjistha in literature⁽³⁴⁻³⁶⁾

Literature	Rasa	Guna	Veerya	Vipaka	Karma
<i>Dhanvantari Nighantu</i>	<i>Madhura Kashaya</i>	<i>Guru</i>	<i>Usnaa</i>	<i>Madhur</i>	<i>Kapha-Vrana-Meha-Asra-Visha-Aamyajeeta</i>
<i>Kaiyadev Nighantu</i>	<i>Kashaya Tikta</i>	<i>Guru</i>	<i>Usnaa</i>	<i>Madhur</i>	<i>Yoniroghana Kaphashopha-Vishapaha Visarpa-Meha-Kustha-Arsa-Vrana-Rakta-Atisarajeeta.</i>
<i>Raaj Nighantu</i>	<i>Madhura Kashaya</i>	<i>Guru</i>	<i>Usnaa</i>		<i>Vrana-Meha-Jwara-Sleshma-Visha-Netramayapaha</i>

In *Charak Samhita Manjistha* Categorized under⁽³⁷⁾

1. *Vishaghana mahakashya*
2. *Varnya dashemani*
3. *Jwara Ghana*

In *Sushruta Samhita* classified into⁽³⁸⁻³⁹⁾

1. *Priyangvadi gana*
2. *Ambasthadi gana*
3. *Pitta sanshaman*

Chemical Constituents of Manjistha

Major chemical constituents are Rubiofolic acid, Rubicoumaric acid (two pentacyclic triterpenes), Ruberythric acid, Rubuanin, Rubiadin, mollugin, lucidin, Purpurin, pseudo purpurin, xanthopurpurin, manjisthin, ten fatty acid with saturated and unsaturated long chains, Naphthoquinones, Naphthohydroquinones, six Anthraquinones, Free alizarin and its glucoside, oleanolic acid acetate, β -sitosterol scopoletol, glucosides, flavonoids, phenols and saponin. The roots and stem are well known source of Anthraquinones and purpurin.⁽¹⁸⁾

Action and uses⁽⁴⁰⁻⁴³⁾

Stem is bitter, acrid, astringent, thermogenic in nature and cooling potency. The dried stem is used in blood, skin and urinogenital disorder, dysentery, piles, ulcers, inflammation, erysipelas, skin disease and rheumatism.

Action: The root is Sweet, Bitter, Acrid, Astringent, Alterative, Thermogenic, Antidysentric, Anti-inflammatory, Antitussive, Expectorant, Antipyretic, Analgesic, Anodyne, Antihelminthic, Antiseptic, Diuretic, Galactopurifier, Febrifuge, Emmenagogue, Styptic, Rejuvenating and Tonic.

Pharmacological property: Blood purifier, Anti-oxidant, wound -healing, immunomodulator, Analgesic, Diuretic, Gastroprotective, Hepatoprotective and Nephroprotective.

Various researches as evidence

Anti- acne property⁽⁴⁴⁻⁴⁵⁾

Anthraquinone rich fraction of *Rubia cordifolia* in a gel formulation against *Propionibacterium acne*, *staphylococcus epidermidis* when compared with clindamycin gel.

Wound healing activity⁽⁴⁶⁾

Root extract of *Rubia cordifolia* was reported as an effective wound healing principle in experimental models as wound healer. Ethanolic extract and the hydrogel formulation of roots were found to be effective the functional recovery and healing of wound and histopathological alterations.

Anti-inflammatory activity⁽⁴⁷⁻⁴⁸⁾

Aqueous extract in rats with carrageenan paw odema in a dose dependent manner which is comparable to that of phenylbutazone. It also inhibit the lipooxygenase enzyme pathway which catalyses the production of various inflammatory mediators such as leukotrienes that are involved in asthma, arthritis and other inflammatory disorders and the production of cumene hydroperoxides. A formulation of Munjisthin and purpurin from cell culture manifested to have and antiproliferative action during rapid development of a model oedema.

Anti-microbial activity⁽⁴⁹⁾

According to Basu *et al.* the aqueous extract is active against *Bacillus subtilis* and *Staphylococcus aureus* compared with streptomycin and pencillin G. The ethanolic whole plant extract also showed same result.

Rubiaccordone A reported to have considerable antimicrobial activity against Gram +ve bacteria like *Bacillus subtilis*, *streptococcus faecalis* and *Bacillus cereus*.

Neuroprotection⁽⁵⁰⁾

It has been reported to contain a wide variety of antioxidants and exhibited strong free radical scavenging properties against reactive oxygen and nitrogen species.

The alcoholic extract administration reduced the β -amyloid induced cognitive and memory dysfunction in rats. The extract decreases the neuro-degeneration and helps in memory retention.

Antioxidant Property⁽⁵¹⁾

The study of in vivo antioxidant activity and its influence on ethanol-induced immune-suppression showed that the concurrent daily administration prevent the decrease of humoral and cell mediated immune response, phagocytosis index, leukocyte count, etc. which were comparable with that of combination of vitamin E and C.

Discussion

Relief of symptoms in Kikkisa

On basis of *Rasa Panchak*, Medicinal properties and pharmacological action relief the symptoms of *Kikkisa* like

Vidah: *Vidah* is primary complain of patient due to tearing of fibres and vitiation of *Pitta dosha* mainly occur during second trimester of pregnancy. *Pittashamak* property of *Manjistha* along with *Tikta* and *Kashaya Rasa* and *Madhur veepak* causes *Daha Shaman*.

Kandu: *Kandu* is the symptom of *Kaph* mainly but in *Kikkisa* it is due to dryness of skin and *Vata dosha* is the main reason behind it. Tearing of fibres also alleviates *Vata dosha*. *Madhur rasa* of *Manjistha* pacifies the *Vata dosha* relieving *Kandu*. *Kandughana* action is performed by *Tikta* rasa. Mildly elevated SGOT, SGPT and Alkaline phosphates is also another reason behind itching during pregnancy.

Vaivarnya: *Manjistha* is included under *Varnya Dashemani*. *Ushna veerya* accelerate the action of *Bhrajak Pitta (Agni)*, which is responsible for skin colour and luster. Due to *Tikta Rasa* and *Katu Vipaka* have *Kushthaghna* property and *Kashaya Rasa* has *Varnya* action.

Vairupya: *Rakta prasadan* by *Tikta rasa* of *Manjistha* along with other factors contributes to nature the skin and maintain its proper lustre and texture and prevent the *Vairupya* caused due to tearing of skin.

Mode of Absorption: Cutaneous Biotransformation for Local action on skin.

Agni situated in skin in the form of *Bhrajak pitta* facilitates *Pachana* of active principles of drug for absorption (catabolic degradation by enzymes) and pacify the provoked *Doshas* and relieves local symptom like *Vidah*, *Kandu* and *Vaivarnya* by breaking pathogenesis. We look the etiopathogenesis of *Kikkisa*, *Pitta* is mainly vitiated *Doshas* along with *Vata* and *Kaph* and *Bhrajak pitta* works on skin and responsible for complexion and color of skin. Properties of *Manjistha* described in literature indicates that it can be used in *Pittaj vyadhi* specially skin related disease. The properties like *Vishagna*, *Varnaya*, *Ropana*, *Sandhaniya*, *Twachya* and *Pittashamak* action promotes the pigmentation of skin and facilitate the skin tonic action.

Manjistha is able to bind with *Amavisha* (free radicals) and *Garavisha* (xenobiotics) toxins which cause inflammation, skin disease, ulcers, and other problems. A balanced combination of *soma* (cooling) and *Agni* (heat) found in *Manjistha* facilitates the herb to penetrate into the cellular level of tissues with help of *Agni* and *Soma* helps to

soak up the toxins and neutralize them. It is drug with multiple activities helps in prevention of itching, burning and scar formation and acts as coloring agent for depigmentation of skin.⁽³³⁾

So it can be evolved as a drug which will be effective in reducing all types of striae marks (*linea alba* - *linea nigra*) and healing and maintaining the pigmentation level. So preventing the scar formation and can be used as cosmeceutical product in combination with other drugs.

CONCLUSION

Manjistha is a drug used since ancient time as a colouring agent and promotes pigmentation of skin. It acts as a skin protective and healing herb by virtue of wound healing, antimicrobial, antifungal and antibacterial properties which is revealed by my researches. Codified and uncoded therapeutic use of *Manjistha* for skin ailments can be proved on the basis of available references for *Varnya*, *Vishaghana*, *Krimighana* and *Kushthaghna* action from various literature. *Kikkisa* or *Striae gravidarum* is burning problem in 90% pregnant women in modern era and vitiated *Pitta dosha* along with physiological changes in skin due to overstretching of skin is responsible mainly. Women are more conscious towards their appearance leading more consumption of Cosmeceutical products in day to day life. *Manjistha* promotes skin pigmentation in striae (*linea alba*), prevents itching and other skin infection and promotes healing process of skin. So it can be raised as important ingredient in development of herbal cosmeceutical product for prevention of *Kikkisa* (*Striae gravidarum*).

REFERENCES

1. Shastri Ambikadutta, Shushruta Samhita Of Maharshi Susruta Edited With Ayurveda-Tattva Sandipika, Part- 1, Chaukhambha Sanskrit Sansthan, Edition-2007, Sutra Sthan-15 Verses 48, Pg-64.
2. Shastri Kashinath Pt, The Carak Samhita Of Agnivesa Of Cakrapanidatta, Part -1, Chaukhambha Sanskrit Sansthan, Edition-2006, Sharir Sthan-15 Versus 32, Pg-831.
3. Sashtri Kashanath, The Charak Samhita Of Agnivesh, Part-1, Chaukhambha Visvabharti, Varansi-2005, Viman Sthan-8 Versus 103, Pg-775.
4. Joshi LS, Pawar HA (2015) Herbal Cosmetics and Cosmeceuticals: An Overview. Nat Prod Chem Res 3: 170. doi:10.4172/2329- 6836.1000170.
5. Shastri Ambikadutta, Shushruta Samhita Of Maharshi Susruta Edited With Ayurveda-Tattva Sandipika, Part- 1, Chaukhambha Sanskrit Sansthan, Edition-2008, Chikitsa Sthan- 14 Verses 188, 192, Pg-368-369.
6. Shastri Kashinath Pt, The Carak Samhita Of Agnivesa Revised By Carak And Drdhabala, Part -1, Chaukhambha Bharati Academy, Edition-2005, Sutra Sthan- 4 Verses 8, 16, 39, Pg78, 83, 92.
7. Shastri Kashinath Pt, The Carak Samhita Of Agnivesa Revised By Carak And Drdhabala, Part -1, Chaukhambha Bharati Academy, Edition-2005, Cikitsa Sthan-8 Versus 175, Pg-248.

8. Shastri Kashinath Pt, The Carak Samhita Of Agnivesa Revised By Carak And Drdhabala, Part -1, Chaukhambha Bharati Academy, Edition-2005, Cikitsa Sthan-12 Versus 68, Pg-307.
9. Shastri Kashinath Pt, The Carak Samhita Of Agnivesa Revised By Carak And Drdhabala, Part -1, Chaukhambha Bharati Academy, Edition-2005, Cikitsa Sthan-25 Versus 114, 116, Pg-633.
10. Sharma P.V.Dravya Guna Vijnana-Vol-1, Chaukhambha Bharati Academy, Varanasi-2007, Ch-10, Rakta Varga, Pg- 122.
11. Shastri Kashinath Pt, The Carak Samhita Of Agnivesa Revised By Carak And Drdhabala, Part -1, Chaukhambha Bharati Academy, Edition-2005, Cikitsa Sthan-30 Versus 108, Pg-765.
12. Pharmacogonony of Indigenous Drugs, Cccras-1999 - Pg-378, Vol-1, Database On Medicinal Plants Used In Ayurveda, Pg-152, Vol-1.
13. Nadkarni K.M., Indian Materia Medica, Bombay Popular Prakashan, 2007, Vol-1, 750, Pg-414-415.
14. Nadkarni K.M., Indian Materia Medica, Bombay Popular Prakashan, 2007, Vol-1, 2162, Pg-1075.
16. Herbal wealth of Uttrakhand, Vol-1, edited by Abhimanyu kumar, Central Council For Research In Ayurvedic Sciences, edition 2014, pg-340.
17. More D.B, Gajarmal A., Shende M.B, Comparitive studies of different samples of Manjistha (*Rubia cordifolia*) w.s.r to deshichara. IJAHM 4(5), Sep-Oct 2014 (1579-1584).
18. S.Reenu Pendil et.al, World Journal Of Pharmacy And Pharmaceutical Sciences, Phytochemical Analysis Of Root, Stem And Leaf Extract In *Rubia Cordifolia*, Vol-2, Issue 10, 826-838, ISSN 2278-357.
19. Shastri J.L, Dravyaguna Vigyan: Chaukhamba Orientalia; Varanasi 2005, Pg. 513-514.
20. Kashinath Pt, The Carak Samhita of Agnivesa Revised By Carak And Dridhabala, Part -1, Chaukhambha Bharati Academy, Edition-2005, Sharir Sthan-8 Versus 32, Pg-831, 832.
21. Gupta Atridev Kaviraja, Astanga Hridaya Of Vagbhata, Chaukhambha Prakashan, Varanasi, Edition-2007, Sharir Sthana-1 Versus 58, Pg-17.
22. Acharya Bhela, Bhela Samhita, Commentary By Dr. K.H. Krishnamurthy, Edited By Prof.P.V.Sharma, Chaukhambha Visvabharti, Varanasi, Reprint-2008, Sharir Sthana-8 Versus 6, Pg-1.
23. Ashtanga Sangraha With Shashilekha Commentary Of Indu, Vol 01 to 03, Central Council For Research In Ayurveda And Siddha; New Delhi, 1991.
24. Dermatological Formulations Percutaneous Absorption in drugs and the pharmaceutical Sciences, by B.W.B. edited by Swarbrick J. Newyork, Marcle Dekker, Vol.18, 1983.
25. Text book of clinical Dermatology by Virendra. N. Sehgal, Jaypee Brothers Medical Publishers Delhi, 4th edition.
26. Text book of Gynaecology by D. C. Dutta. New Central Book Agency; Calcutta, 4th Edition : 2003.
27. S.Ud-Din et. al., Journal Of European Acadmey Of Dermatology And Venereology, Topical Management Of Striae Distensae Prevention And Therapy Of Striae Rubrae And Albae, 2016, 30, 211-222.
28. Tewari Premvati, Ayurvediya Prasutitantra Evam Striroga, Part-1, Chaukhambha Orientalia, Varanasi, 2009, Ch-5, Pg-251.
29. Gupta Atridev Kaviraja, Astanga Hridaya Of Vagbhata, Chaukhambha Prakashan, Varanasi, Edition-2007, Sharir Sthana-1 Versus 59-61, Pg-175.
30. Acharya Vagbhata, Astang Sangraha, Translated By Prof. K.R. Srikantha Murthy, Vol-1to 3, 5 Edition, Chaukhambha Orientaia, Varanasi, Reprint-2005, Sharir Sthana-3 Versus 10.
31. Acharya Bhela, Bhela Samhita, Commentary By Dr. K.H. Krishnamurthy, Edited By Prof.P.V.Sharma, Chaukhambha Visvabharti, Varanasi, Reprint-2008, Sharir Sthana-8 Versus 6.
32. The Ayurvedic Pharmacopoeia Of India, Government Of India Ministry Of Health And Family Welfare, Department Of ISM & H, New Delhi, Controller Of Publication Civil Lines, Part-1-Vol-3, Pg- 112-114.
33. Chunekar K.C., Bhavaprakasha Nighantu Of Sri Bhavamisra, Chaukhambha Bharati Academy, Varanasi, 2013, Ch-1 Versus 188-191, Pg-107.
34. E-Nighantu (Collection Of Ayurvedic Lexicon), National Institute Of Medical Heritage, Hyderabad, Raaj Nighantu-6 Versus 190-195.
35. E-Nighantu (Collection Of Ayurvedic Lexicon), National Institute Of Medical Heritage, Hyderabad, Dhanvantari Nighantu-5 Versus 127.
36. Sharma P.V., Kaiyadeva Nighantu, Chaukhambha Orientalia, Varanasi, 2006, Ch-1 Versus 910, Pg-168.
37. Shastri Kashinath Pt, The Carak Samhita Of Agnivesa Revised By Carak And Drdhabala, Part -1, Chaukhambha Bharati Academy, Edition-2005, Sutra Sthan- 4 Verses 8, 16, 39, Pg78, 83, 92.
38. Shastri Ambikadutta, Shushruta Samhita of Maharshi Susruta, Edited With Ayurveda-Tattva Sandipika, Part-1, Chaukhambha Sanskrit Sansthan, Edition-2010, Sutra Sthan - 38 Verses 45, 46 Pg-187.
39. Shastri Ambikadutta, Shushruta Samhita Of Maharshi Susruta, Edited With Ayurveda-Tattva Sandipika, Part- 1, Chaukhambha Sanskrit Sansthan, Edition-2010, Sutra Sthan-40 Verses 8, Pg-191.
40. Nadkarni K.M., Indian Materia Medica, Bombay Popular Prakashan, 2007, Vol-1, 364, pg-207.
41. Sharma P.C, Yelne M.B Et Al, Database On Medicinal Plants Used In Ayurveda, CCRAS, 2000, Vol-1, Pg-152.
42. K.Raghunathan And Miss Roma Mitra, Pharmacogony Of Indigenous Drugs, Vol-1, Central Council of Research In Ayurveda And Siddha, New Delhi, Reprint -1999, Pg- 376.
43. Database On Medicinal Plants Used In Ayurveda, Vol-1, Central Council for Research in Ayurveda and Siddha, New Delhi, Reprint 2000, pg.-155.
44. Khan N, Karodi R, Siddiqui A, Thube S, Rub R. Development of anti-acne gel formulation of

- anthraquinones rich fraction from *Rubia cordifolia* (Rubiaceae), Int. J. Applied Res. Natl. Products 2012;4:28-36.
45. Jain A, Bansal E, Inhibition of propionibacterium acnes induced mediators of inflammation by Indian herbs, Phytomedicine.2003;10:34-38.
46. Karodi R, Jadhav M., Rub R, Bafna A. Evaluation of wound healing activity of a crude extract of *Rubia cordifolia* in mice, Int. Jr. Of Applied Res I Nat. Products, Vol.2(2)pp-12-18, June-July 2009.
47. Antarkar SS, Chinwalla T, Bhatt N, Anti-inflammatory activity of *Rubia cordifolia* in rats, Ind J. Pharmacol 1983;15:185-188.
48. Tripathi YB, Sharma M, Shukla S et al, *Rubia cordifolia* inhibits potato lipoxygenase, Indian J. Exp. Bio 995a; 33:109-112.
49. Jani Dilip Khemji, Sawant Bipin Vithal et al, Exploration in Pharmacological screening of *Rubia cordifolia* versus Ayurvedic documentation: A comparative validation, J. Pharm Sci. Innov. 2015; 4(2);87-90.
50. Rawal Ak, Muddeshwar MG, Biswas SK, *Rubia cordifolia*, *Fagonia cretica*, Linn and *Tinospora cordifolia* exert neuroprotection by modulating the antioxidant system in rat hippocampal slices subjected to oxygen glucose deprivation, BMC Complem Altern. M 2004b;4:11-19.
51. Lodha S, Kansala L, Antioxidant activity of *Rubia cordifolia* against lead toxicity, Int. J. Pharm Sci.Res 2012 ;3:2224-2232.

Cite this article as:

Sarita Verma, D. C. Singh, Ritu Singh, Rupesh Kumar Sanger. Manjistha (*Rubia Cordifolia*) as Cosmeceutical Remedy for Prevention of Striae Gravidarum. International Journal of Ayurveda and Pharma Research. 2017;5(6):60-65.

Source of support: Nil, Conflict of interest: None Declared

***Address for correspondence**

Dr Sarita Verma

M.D. Scholar, P.G. Dept. of Dravyaguna, Rishikul Campus Haridwar, Uttarakhand Ayurveda University, Uttarakhand, India.

Email: ayush.sarita@gmail.com

Mob- 7500997627

Disclaimer: IJAPR is solely owned by Mahadev Publications - A non-profit publications, dedicated to publish quality research, while every effort has been taken to verify the accuracy of the content published in our Journal. IJAPR cannot accept any responsibility or liability for the articles content which are published. The views expressed in articles by our contributing authors are not necessarily those of IJAPR editor or editorial board members.

