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Chakramard (*Cassia tora* Linn.): Natural Drug for Skin Disorder

Vinita Tiwari

Lecturer, P.G. Department of Dravyaguna, Major S.D.Singh P.G. Ayurvedic Medical College,
Farrukhabad (U.P.), India email- drvinita38@gmail.com

ABSTRACT:

Chakramard (*Cassia tora* Linn. Family-Leguminaceae) is a wild crop grows in most part of India. *Acharya Charak* described it as name *Adagaja* and use in skin diseases. Due to use in ringworm, it is known as ringworm plant. It pacifies *Vatta Kapha doshas*. Phytochemical constituents in *Chakramard* are anthraquinones, obtusifolin, chrysophanol, emodin, obtusin glycosides, saponins, fixed oils and fats, protein and carbohydrates. Therapeutically used in worm infestation, infection, blood purifiers in children and fever during teething. It is very useful in treating skin diseases like itching, body scratch, eczema, dermatomycosis, psoriasis, and leprosy. It also acts as mild laxative and diuretics so also use in constipation, cough, bronchitis, dyspepsia, flatulence, and cardiac diseases. *Chakramard* decoction is used for washing and healing of wounds.

KEYWORDS: *Chakramard*, *Cassia tora*, Skin disease, Ringworm, Blood purifier

***Corresponding Author**

Dr. Vinita Tiwari

Lecturer, P.G. Department of Dravyaguna

Major S.D.Singh P.G. Ayurvedic Medical College,

Farrukhabad (U.P.), India

email- drvinita38@gmail.com

INTRODUCTION:

In recent five decades, various types of skin Diseases have gained. Some of the disease like scabies and allergic dermatitis may occur with the epidemic distribution. Due to their severity, attention has been made by medical professionals and the general public in recent years. The prevalence of skin diseases in India is 10 to 12% of the total population. Psoriasis and Eczema are being major contributors to these conditions. Due to Global warming, increased pollution, UV light, an unhealthy diet, skin diseases are increasing day by day.

Chakramarda (*Cassia tora* L.) is a well-known herb distributed in India and other tropical countries. It is an annual under a shrub and grows in wild wasteland. Leaves, Root and Seeds of plant are used for medicinal uses in various skin diseases. The plant has been used from time immemorial in many skin ailments. In various tribal communities, it has been frequently used for skin problems. Due to its importance in skin diseases, it is also called Ringworm Plant.

MATERIALS & METHODS:

To elaborate and elucidate the potential of *Chakramard* in the treatment of skin disorders, review of literature is an essential prerequisite. The review was started from classical texts of Ayurveda i.e *Brihatrayi*. After that *Chikitsa grantha*, *Nighantu grantha* and currently available scientific studies were reviewed.

REVIEW OF DRUG:

Table-1 Review of Drug in Charaka Samhita¹

Synonyms	Dosage Form/ Part Used	Indications	References
<i>Edgaja</i>	External/	Skin Diseases, Piles, Alopecia, Leukoderma, Ringworm, Fistula-in-ano, Scrofula, Kitibh	CS.Su.3/3-7
<i>Prapunnada</i>	External/ Seeds	Skin Disease	CS.Su.3/13
<i>Edgaja</i>	External/	Skin Disease	CS.Su.3/15-16
<i>Prapunnada</i>	External/ Seeds	Kustha	CS.Ci.7/93
<i>Edgaja</i>	Kanaka Kshiri Tail	Mandala Kustha, Krimi, Kandu	CS.Ci.7/116
<i>Edgaja</i>	External/	Worms, Mandala Kustha, Dadru, Siddma Kustha, Svitra	CS.Ci.7/126-127, 160-61

Table-2 Review of Drug in Sushruta Samhita²

Synonyms	Dosage form/ part used	Indications	References
<i>Prapunnad</i>		Urdhvaabghar Dravya, Restoration of the normal skin colour of scar	SS.Su.39/3; Ci.1/97
<i>Chakramard</i>	Lepa/ Seeds	Dadru	SS.Ci.9/12,13
<i>Prapunnada</i>	Lepa	Svitra	SS.Ci.9/19
<i>Prapunnada</i>	Kwath	Mahakustha	SS.Ci.10/4

Table-3 Review of Drug in Chikitsa Grantha

Synonyms	Dosage form/ part used	Indications	References
Prapunada	Scrubbing powder/ Seeds	Dadru, Kustha	CD.49/22-23 ³
Cakravyah	Lepa	Kitibha, Kustha	CD.49/32
Prapunada	-	Kustha	CD.50/22
Chakramard	Madhyamanjithadi kwath	Kandu, Mandal Kustha	BP.54/101-103 ⁴
Chakramard	Mahamarichyadi tail	Kandu, Kustha	BP.54/112-120
Chakramard	Saindhavadi tail	Pama, Kandu	BP.54/135
Chakramard	Kacchu raksha tail	Kacchu Chikitsa	BP.54/137-141
Chakramard	Durvadi yoga	Dadru, Kustha	BP.54/142
Prapunada	Scrubbing powder	Sitapitta	BP.55/12
Edgaja	Lepa	Kustha	YR.55/58 ⁵
Chakramard	Panchanimba churna	Kustha	YR.55/71-78
Prapunada	Vajra taila	Sinuses, Infected Wound	YR.55/140-142
Prapunada	Lepa/seeds	Dadru, Siddhma, Pama, Kitibh, Kapala Kustha	YR.55/155
Prapunada	Lepa/seeds	Dadru	YR.55/157
Chakramard	Lepa	Severe Itching	YR.55/158
Edgaja	Lepa	Dadru, Kustha, Spider Bite, Gajacharma, Mandala, Rakksa	YR.55/159, 162-163, 172-184
Chakramard	Lepa	Pama, Itch, Kacchu, Charnadala, Vicharchika	YR.55/185
Chakramard	Lepa	Pama, Kandu	YR.55/186
Chakramard	Brihatsindura Taila	Kustha, Complexion	YR.55/188-191
Chakramard	Brihat Marichydia Taila, Maheshwar Ghrit	Pama, Kandu, Vicharchika, Charnadala, Kacchu, Kustha	YR.55/192-197,198,200
Prapunada	Lepa	Dadru, Sittapitta, Kustha	YR. 56/21-23
Chakramard ⁶	Kasisadi Ghrit	Kustha, Dadru, Pama	Sa.Mk.9/51-57
Prapunada	-	Kustha, Kilasa, Dadru, Pama	Sa.Uk.11/40-44, 50-56
Prapunada ⁷	-	Scalp Disease	GN.3/1/63
Edgaja	-	Kustha, Kilasa, Pama, Kitibha, Dadru, Indralupta	GN.36/110-114
Chakramard	-	Dadru, Kandu	GN.36/124
Prapunada	Seeds	Pama, Kustha	GN.36/129
Edgaja	-	Kandu, Vicharchika, Dadru, Mandal	GN.36/130,132
Chakramard	Seeds	Dadru, Kacchu, Kandu, Kitibha, Kustha	GN.36/137, 138-140,161,162
Edgaja	-	Mandala, Kustha, Siddhma, Krimi, Dadru	GN.36/175
Prapunada	Seeds	Kustha	GN.36/179
Edgaja	-	Dadru	GN.36/180
Chakramard	-	Kustha	GN.36/186-194
Prapunada	-	All Kustha	GN.36/203-206
Chakramard	-	Kustha	GN.36/211
Edgaja	-	Svitra	GN.36/243
Prapunada	-	Sitapitta	GN.37/14
Prapunada ⁸	-	Easy Delivery	VM.13/30
Chakranga	Lepa/Seeds	Kitibha	VM.51/35
Prapunatak ⁹	Recipes/ Leaves	Vata Vyadhi	SBM. 4/461
Chakramard ¹⁰	Lepa/ Seeds	Kustha	VS.66,67
Chakramard	Lepa	Dadru,Kitibh, Kandu	CA.U/9
Edgaja	Lepa	Dadru, Siddhma, Krimi Kustha	CA.U/11;14
Chakramard	Brihat Durvadi Lepa	Kustha, Dadru, Kitibha	CA.U/23
Dadrughna	Bhurjagranthayadi Lepa	Kaknaka Kustha	CA.U/25-26
Prapunadadak	Nimbadi Mahakashaya	Dadru, Maha Kustha, Soth	CA.U/50-52

<i>Prapunnada</i>	Udayamartand Kashaya	Vrana, Krimi, Kustha	CA.U/53-58
<i>Dadrughna</i>	Vidangadi Churna	Kustha	CA.U/67
<i>Dadrughna</i>	Bhallataka Kalpa	Kustha, Krimi, Pama, Nadivrana, Valitpalit, Visarpa	CA.U/83-89
<i>Padamata</i>	Mahabhallataka Guda	Kustha	CA.U/98-110
<i>Dadrughna</i>	Tranaka Tail/ Seeds, Mahatranaka Taila	Kustha, Pama, Kandru	CA.U.128, 130-132
<i>Chakramaraka</i>	Brihat Marichyadi Taila	Dadru, Kustha	CA.U/142-149
<i>Edgaja</i>	Brihatsinduradi Tail/Seeds	All Kustha, Visarpa, Pama, Dadru, Rakta Pitta	CA.U/136-138
<i>Edgaja</i>	Somraji Taila	Kustha, Pama, Kandru	CA.U/150-152
<i>Edgaja</i>	Brihat Somraji Taila	Kustha, Visarpa, Pama	CA.U/153-157
<i>Edgaja</i> ¹¹	Lepa	Svitra	CA.U/167
<i>Dadrughna</i>	Lepa	Dadru	AC.Ci/8
<i>Chakramard</i>	Lepa/Seeds	Dadru, Vicharchika	AC.Ci/10
<i>Edgaja</i>	Lepa	Dadru, Vicharchika, Kustha	AC.Ci/11-12
<i>Chakramard</i>	Mahalepa	Dadru, Kustha	AC.Ci/18-30
<i>Edgaja</i> ¹²	Brihat Marichyadi Taila	All Kustha, Visarpa, Pama, Dadru	AC.Ci/73-80
<i>Chakramard</i>	Lepa	Dadru	BR.69/8,9
<i>Edgaja</i>	Edgajadi Lepa		BR.69/10,11
<i>Chakramard</i>	Lepa	Dadru, Kustha	BR.69/14
<i>Chakrahvya</i>	Lepa	Kustha, Dadru, Kitibha	BR.69/17
<i>Prapunnata</i>	Pradadadi Lepa	All Kustha, Visarpa, Pama, Dadru	BR.69/26-28,35
<i>Chakramard</i>	Lepa	Kacchu	BR.69/42
<i>Edgaja</i>	Lepa	Svitra	BR.69/44
<i>Chakramard</i>	Panchanana Taila	Kustha, Dadru	BR.69/55-67
<i>Chakramard</i>	Manjisthadi Kwath	Kustha, Dadru, Pama, Kandru	BR.69/77
<i>Chakramard</i>	Tranaka Taila	Dadru, Kustha	BR.69/155
<i>Edgaja/</i>	Mahatranaka Taila/Seeds	Svitra	BR.69/156-163
<i>Chakramard</i>	Brihat Marichyadi Taila	Kustha, Kitibha, Pama	BR.69/176-183
<i>Mardaka</i>	Kandarpasara Taila	Kandru	BR.69/199-203
<i>Dadrughna</i>	Kacchurakasa Taila	Kacchu, Kustha	BR.69/208-210
<i>Edgaja</i>	Somaraji Taila	Dadru, Kustha	BR.69/211-216
<i>Dadrughna</i>	Brihat Somraji Taila	Kustha, Kandru	BR.69/238-251
<i>Padmata</i>	Maha Bhallataka Guda	Kustha, Kitibha, Pama	BR.69/274-277
<i>Dadrughna</i>	Apar Talkeshwar Bhasma	All Kustha, Visarpa, Pama, Dadru	BR.69/274-277
<i>Edgaja</i>	Jyotisman Rasa/ Leaves	All Kustha, Visarpa	BR.69/352
<i>Chakramard</i>	Mahapinda Tail/ leaves	All Types of Kustha	BR.69/353-358
<i>Prapunnad</i> ¹³	Scrubing powder	Sita-Pitta	BR.70/9

Nighantu Grantha:

Sushrut Nighantu¹⁴- only synonyms- *Chakramarda*, *Pukkilaka*, *Prapunnata*, *Edgaja*, *Meshakshi-Kusum* have been given.

Astanga Nighantu¹⁵- Only synonyms- for *Chakramarda* have been given- *Prapunnata*, *Edgaja*, *Dadrughna*, *Chakramardaka*.

Dhanawantari Nighantu¹⁶- *Chakramarda* has been given in *Karviradi varga* as *Chakramarda*, *Edgaja*, *Meshakshi Kusum*, *Prapunnata*, *Chakrahvya*, *Chakrika*. It pacifies Vata-Kapha and its Saka pacifies Vata- Rakta. Useful in *Dadru*, *Kandru*, *Siddhma*, *Kustha* and glowing skin.

Sodhala Nighantu¹⁷ - *Chakramarda* has been given in *Karviradi Varga*.

Hridaya Deepak Nighantu¹⁸ - The synonyms of *Chakramarda* have been given as *Chakramarda*, *Edgaja*, *Prapunnada*, *Chakrahvya*.

Madanpala Nighantu¹⁹ - *Chakramarda* has been described as *Prapunnata* and pacifies *Pitta-Vata*. Its *Saka* is *Laghu* and pacifies *Kapha*.

Kaidev Nighantu²⁰ - *Chakramarda* has been described in *Ausadhi Varga* as *Dadrughna*, *Edgaja*, *Chakramarda*, *Chakrika*, *Kasodaka*, *Mardaka*, *Avartaka*. It pacifies *Pitta-Vata*. Its *Saka* pacifies *Vata-Kapha* and increases *Pitta* and *Guru Guna* and fruit pacifies *Kapha-Vata*.

Bhavaprakash Nighantu - *Chakramarda* has been described in *Haritkyadi Varga*. In *Saka Varga*, leaves are *Laghu* in *Guna* and used as *Saka* which pacifies *Vata-Kapha*. It is useful in *Kandu*, *Dadru*, *Kustha*.

Raja Nighantu²¹ - Described in *Shatahvadi Varga* and synonyms- *Edgaja*, *Gajakhya*, *Meshahvya*, *Chakragaj*, *Chakri*, *Punnad*, *Punnat*, *Vimardak*, *Dadrughna*, *Chakrahva*, *Dridhbeej*, *Kharjurghna*. It has been used in *Vrana*, *Kandu*, *Kustha* and *Dadru*.

Shaligram Nighantu - *Chakramarda* pacifies *Vata-Pitta* and *Laghu* in *Guna*, useful in *Kandu*, *Krimi*, *Kustha*.

Nighantu Ratnakar²² - *Chakramarda* is useful in *Kasa*, *Swasa*, *Kustha*, *Dadru*, *Krimi*. Its fruit is *Ushna* and useful in *Kustha*, *Kandu*, *Dadru*, *Visha*, *Gulma*.

Nighantu adarsha²³ - described in *Putikaranjadi Varga*

Saraswati Nighantu²⁴ - Two special Synonyms as *Visantika* and *Kanaka* have been given in this nighantu which is not found in other nighantus.

Classical Pharmacology (Rasa Panchaka)²⁵:

Rasa- *Katu*, *Madhura*

Veerya- *Ushna*

Vipaka- *Katu*

Guna- *Laghu*, *Ruksha*

Dosha Karma- *Kapha-Vata shamak*

Rogaghna- *Kaphaghna*, *Swasaghna*, *Kusthaghna*, *Dadrughna*, *Krimighna*, *Kandughna*, *Visaghna*, *Gulmaghna*, *Kasaghna*.

Others- seeds are useful in *Daurbalya*, *Agnimandya*, *Twakaroga*. *Patra* is used in *Krimi*, *Jwara*, and *Virechana*.

Matra- *Beej Churna*- 1-3gm, *Patra Swarasa*- 5-10ml

Table-4 Comparative Pharmacodynamics of Chakramarda in Ayurvedic texts

Parts/Used	Rasa	Guna	Virya	Vipaka	Doshakarma	References
Whole	Madhura	Laghu, Rukhsa	-	-	Pitta-Vata↓	BP/H/211
Seeds	-		Ushna	Katu	Vata↓	BP/H/212
Leaves	-	Laghu			Vata-Kapha↓	BP/S/36
Whole	-		Ushna	Katu	Vata-Kapha↓	DN/K/4
Seeds	-		-	-	Vata- Rakta↓	DN/K/4
Leaves	-	Laghu	-	-	Kaphahar	DN/K/4
Whole	-		-	-	Kapha-Vata↓	SN/K/388-89
Whole	Madhura	Laghu, Ruksha	-	-	Pitta-Vata↓	MPN
Seeds	-		Ushna	-	Vata↓	MPN
Leaves	-	Laghu	-	-	Kapha↓	MPN
Whole	Madhura	Laghu, Ruksha	-	Katu	Pitta-Vata↓	KN
Leaves	-	Guru	-	-	Kapha-Vata↓, Pitta↑	KN
Seeds	-		Ushna	-	Kapha-Vata↓	KN
Leaves	-	Laghu		-	Vata-Kapha↓	Sa.N
Whole	-			Katu	Vata-Kapha↓	RN/S/200
Whole	Madhura	Laghu, Ruksha		-	Pitta-Vata↓	NR
Seeds	-		Ushna	Katu	Vata↓	NR
Whole	Madhura, Tikta	Ruksha, Laghu	Sita	Katu	Vata-Kapha↓	NR
Seeds	-		Ushna	Katu	Kapha↓	NR
Leaves	-	Laghu	Ushna	-	Pitta↓, Kapha-Vata↓	NR
Leaves	-	Ruksh, Laghu	Sita	-	Kapha↓, Vata-Pitta↑	S.Su/ 7677

Botanical Description²⁶:Fig. 1 Plant of *Chakramard*Fig. 2 Flowers of *Chakramard*



Fig. 3 Pods of the plant



Fig. 4 Seeds of the plant

Cassia tora is a stout erect, smooth and smelling, half woody, annual, 1 mt. or less in height.

The stem is erect, circular, smooth, green in fresh, dark brown in dry, much branched, branches arise at nodes.

Leaves are 8 to 12 cm. long and pinnately compound with 3-4 pairs of obovate mucronate leaflets, lowest pair of the leaflet is smallest. Leaves are furnished with glands on the main rachis between leaflets. Stipules 1.3-2cm long, linear subulate, caduceous. Leaflets are opposite, oblong-ovate or obovate and 2 to 5 cm long, glaucous, membranous, glabrous or more or less pubescent, base somewhat oblique, usually rounded; main nerves 8-10 pairs; petioles 2.5 mm long, pubescent.

Flowers- are large bright yellow in colour, borne on the terminal and axillary racemes. Flowers have five petals. Each petal has a diameter of about half an inch. The flowers are crowded in pairs, in axils of upper leaves, 1.5cm across, common peduncle in fruit not exceeding 4mm long; pedicels in fruit rarely exceeding 8 mm long. The herb bears flowers during the rainy season and fruit during winters.

Calyx- glabrous, divided to the base; segments 5mm long, ovate, acute, spreading. The tube is short; sepals are imbricate.

Petals are 5, pale yellow, subequal, 8 by 2.5mm oblong, obtuse, spreading, the upper petals (standard) 2 lobed, others entire.

Stamens are 10, rarely all perfect, upper 3 to 5 being reduced to minute staminodes or sometimes absent, remaining are perfect, subequal.

Anthers mostly basifixed opening by terminal spores or with the slit more or less continuous downward.

Ovary- sessile or stalked.

Fruit/pods- are 12 to 25cm long, 4-5mm thick, subtetragonous, much curved when young, obliquely separate, puberulous and not reticulate, sutures are broad.

Seeds-are flattened in the same direction as the pods. They are very hard, oblong to rhombohedral, with obliquely cut pointed ends, 3-7mm in length and 2-3.5mm in width, glossy, dark brown, hilum lies in a small depression at the pointed end, the micropyle at its proximal end. Seeds of *Cassia tora* are about 25-30 number.

Collection- pod are collected from August to October when the seeds are about to ripen and sun-dried. After removal of the pericarp, seeds are used.

Parts used- Leaves, Seeds, Roots

Phytochemistry:

Seeds of *cassia* questin, 2-hydroxyemodin 1-methylether were isolated the first time. Seeds contain anthraquinones namely, aurantio-obtusin, chryso-obtusin, obtusin, chryso-obtusin-2-o- β -D-glucoside, physcion, emodin, chrysophanol, obtusifolin, obtusifolin-2-o- β -D-glucoside and anthraquinone glucoside- alaternin 2-o- β -d-glucopyranoside. Three naphthopyrone glucosides- cassiaside, rubrofusarin-6-o- β -D-gentiobioside and toralactone-9-o- β -D-gentiobioside isolated. Phenolic glycoside-rubrofusarin triglucoside, nor-rubrofusarin gentiobioside, demethylflavasperone gentiobioside, torachrysone gentiobioside, torachrysone tetraglucoside and torachrysone apioglucoside²⁷⁻³⁰.

Leaves- emodin, kaempferol-2-D-glucoside, chrysophanol, aloe-emodine, rhein, myricyl alcohol, 1-stachydine³¹⁻³².

Stem bark- anthraquinone-1-hydroxy-5-methoxy-2-methyl anthraquinone, glycoside-5-methoxy-2-methyl anthraquinone-1-0- α -L-rhamnoside, chrysophanol, emodin³³.

Roots- choline, 1,3,5-trihydroxy-6,7-dimethoxy-2 methyl-anthraquinone, myricyl alcohol, chrysophanic acid, 9-anthrone, naphtho- α -pyrone, physcion, rubrofusarin³⁴⁻³⁵.

Traditional uses of cassia³⁶⁻³⁷:

External uses:

- The paste of the plant proves worthwhile in treating skin ailments.
- The juice extracted from the leaves is used to treat rashes, skin ailments and allergies.
- It is very useful in treating skin disease like ringworm and itching or body scratches and psoriasis.
- The vinegar or alcoholic maceration of pounded fresh leaves of the herb is useful in externally treating dermatomycosis and eczema.
- Powders of dried seeds are used in Asthma
- A decoction of parts of *Cassia* are used as an analgesic, anticonvulsant, antipyretic, antifungal, antihelminthic, diuretic, expectorant, laxative, purgative and skin diseases, ringworm and itching.

Cassia Gum³⁸:

The gum powder that is obtained from seeds of *Cassia tora* is called as *Panwar gum*. This gum powder is used for its emulsifying property.

- Gum powder is used for curing skin ailments and is added in the preparation of different forms of skin medications like cream, lotion, etc.
- The seeds also found to show antihelmintic activity for diseases like *Pheretima posthuma* and *Ascaridia galli* due to the presence of flavonoids. The extract exhibit antihelmintic activity when combined in the highest concentration.

Internal uses³⁹:

As a food- the plant can be regarded as a poor man's food. It contains proteins, a small amount of fat, many minerals and natural fibers. As such it is not only useful in solving food problems of the poor, it is also useful in digestion and metabolism correction.

As a culinary- Roasted seeds used as a coffee substitute. In Mexico, seeds are used as a substitute for coffee or adulteration.

Ethnomedicinal Uses³⁶⁻⁴⁰:

Lodha communities- Root bark paste with albumin of hen's egg in bone fracture. Seeds powder with lime in ringworm and other cutaneous diseases.

Santhal communities- Leaf paste in eczema Leaf decoction with a paste of black peppers.

Tharu tribes- Leaves for boils.

Gharwali- Leaf as an antiseptic in boils.

Bastar- Leaf in cuts and seeds in eczema.

Dahanu forest-Leaf in itching, seeds in eczema, ringworm.

Ethnic communities of *Khed taluka*- roots in ringworm.

Konkan- Seeds 6 parts, *Bakuchi* seeds 4 parts, carrot seeds 2 parts powder with cow urine and apply in itching.

Pharmacological activities:

Antifungal activities:

The antifungal activity of crude extract of leaves of *Cassia tora* on five different fungal organisms was examined. The extract significantly inhibited the growth of *C. albicans*, *A.niger*, *S. cerevisiae* and *T.mentagophytes* when tested by spore germination methods⁴¹.

Ethanollic extracts of Cassia seeds and leaves showed positive results for *Candida albicans* and *Microsporum canis* respectively⁴². The fungicidal activities of Cassia extracts and their active principles were determined against *Botrytis cineria*, *Erysiphe graminis*, *Phytophthora infestans*,

Puccinia recondite, *Pyricularia grisea* and *Rhizoctonia solani* using whole plant methods *in vivo*. The responses varied with the plant pathogen tested at 1g/L, the chloroform fraction of *C. tora* showed strong fungicidal activity against *B.cinerea*, *E.graminis*, *P.infestans* and *R. solani*. Emodin, Physcion and Rhein were isolated from the chloroform fraction using chromatographic techniques and showed strong and moderate fungicidal activities against *B.cinerea*, *E.graminis*, *P.infestans* and *R.solani*. Furthermore, aloe-emodin showed strong and moderate fungicidal activities against *B.cinerea* and *R.solani*, respectively⁴³.

Anthelmintic activity:

Alcohol and aqueous extract of seeds were investigated for their anthelmintic activity against *Pheretima posthuma* and *Ascardia galli*. Three concentrations (25, 50 and 100mg/ml) of each extract were studied in activity, which involved the determination of time of paralysis and time of death of the worm. Both the extracts exhibited significant anthelmintic activity at the highest concentration of 100 mg/ml⁴⁴.

Anti-shigellosis activity:

The ethyl acetate fraction of the crude extract showed maximum activity with the zone of inhibition ranging between 23-25mm at the concentration of 200 µg disc-1. The minimum inhibitory concentration of ethyl acetate, chloroform and ethanol extracts were found between 32-64 µg/ml whereas the methanol and petroleum fractions showed MIC values between 128-512 µg/ml⁴³.

Anti-psoriatic activity:

A study was conducted to determine the anti-psoriatic activity of a cream prepared from methanolic extract of *C. tora* leaves by using ultraviolet-B-induced psoriasis in the rat. The different concentrations of creams showed good physical characteristics and passed the sensitivity, irritation, grittiness and bleeding test. The results of acute dermal toxicity showed that the creams were safe up to the dose of 2000 mg/kg. in case of psoriasis model, histopathological analysis revealed that there was the absence of Munro's microabscess, elongation of rete ridges and capillary loop dilation in the section in Test 2 (0.1%) and standard group. Creams and methanolic extract of leaves exhibited a significant reduction in the percentage of relative epidermal thickness and spleen index as compared to positive control⁴⁵.

Another study was conducted to evaluate the antipsoriatic activity of three flavonoids namely luteolin-7-o-β-glucopyranoside, quercetin-3-o-β-D-glucuronide and formononetin-7-o-β-D-glucoside isolated from the ethanol extract of *C.tora* leaves were investigated using UV-B induced photo dermatitis model. The ethanolic extracts (400mg/kg) and isolated compound exhibited a

significant ($p < 0.01$) reduction of relative epidermal thickness when compared with positive control⁴⁶.

Anti-itching activity:

A study was conducted on 80 patients of Dadru (Itching) for evaluation of *Lepa* of a paste of leaves as external use and seeds powder as internal use. The maximum relief was observed in symptoms in itching, lesion and redness⁴⁷.

Antibacterial activity:

The crude extract of seeds inhibited the growth of *Micrococcus pyrogens* var. *albus*, *Micrococcus citreus*, *Corynebacterium diphtheria*, *Bacillus megatherium*, *Salmonella typhosa*, *Salmonella paratyphi*, *Salmonella schottmuelleri* and *Escherichia coli*⁴⁸. The effects of the phenolic glycosides, their aglycones and several other compounds structurally related to them were examined on *E.coli* K12, *Pseudomonas aeruginosa* PAO1 and some strains of *Staphylococcus aureus*. Among them, torachryson, toralactone, aloe-emodine, rhein and emodine isolated from the seeds showed noticeable antibacterial effects on four strains of methicillin-resistant *Staphylococcus aureus* with a minimum inhibitory concentration of 2-64 $\mu\text{g/ml}$ ⁴⁹.

Aqueous, petroleum ether, methanolic and ethanolic extract of Cassia, which was subjected to antibacterial evaluation against both gram positive and gram-negative organisms by cup plate technique. Aqueous extracts of seeds exhibited better antibacterial activities as compared to its petroleum ether, methanolic and ethanolic extracts. Among the organisms tested *S.aureus* was more susceptible to the aqueous extract of this herb. In another study chloroform, methanol and aqueous extract of leaves of cassia showed antibacterial activity (0-5000 $\mu\text{g/ml}$) against 38, 58 and 29 bacterial strains respectively out of 120 various bacterial strains and also methanol extracts showed antifungal activity (0-64 mg/ml) against 3 out of 4 strains. Five strains of *Shigella dysenteriae*, four strains of *Staphylococcus aureus* and three strains of *E. coli*, have shown sensitivity against in vitro treatment of the methanol extracts up to 2000 $\mu\text{g/ml}$ concentration. The minimum inhibitory concentration (MIC) value ranges lies in the range of 2000-2500 $\mu\text{g/ml}$ against *E.coli* ATCC25938 and *Shigella dysenteriae*⁵⁰.

Ethanolic and aqueous extract from the leaves of *C.tora* were investigated for their antibacterial activity. Their concentrations 0.15 mg , 0.31 mg ethanolic and aqueous extracts respectively were studied inactivity, which involved the determination of inhibition zone in mm . Both the extracts exhibited significant antibacterial activity⁵¹.

Anti-inflammatory activity:

Methanolic extract of leaves was investigated against carrageenin, histamine, serotonin and dextran-induced rat hind paw edema. It exhibited significant anti-inflammatory activities against all

these agents. The extract (400 mg/kg) showed maximum inhibition of edema of 40.33%, 31.37%, 53.57% and 29.15% at the end of 3 hr with carrageenin, dextran, histamine and serotonin-induced rat paw oedema respectively. Using a chronic test the granuloma pouch in rats, the extract exhibited a 48.13% reduction in granuloma weight⁵²⁻⁵³.

Nitric oxide scavenging activity:

The methanolic extract of cassia leaf was evaluated for its nitric oxide scavenging and reducing power assays using Rutin and BHT as standards, the extract was studied for its lipid peroxidation inhibition assay using rat liver and brain. In all assays, a correlation existed between the concentration of extract and percentage inhibition of free radical, reducing power and inhibition of lipid peroxidation⁵⁴.

Antioxidant activity:

The antioxidant properties of water extracts from cassia prepared under different degree of roasting were investigated. The water extracts of unroasted cassia showed 94% inhibition of peroxidation of linoleic acid at a dose of 0.2mg/ml which was higher than that of α -tocopherol(82%). Water extracts prepared from cassia roasted at 175°C for 5 min. and at 200°C for 5 min. exhibited 83% and 82% respectively, inhibition of linoleic acid peroxidation⁵⁵. The antioxidant activity of prepared skin herbal cosmetic cream and lotions comprising ethanolic extracts of *C. asiatica*, *G.glabra*, *E.officinale*, *P.granatum*, *A. catechu*, *C. zeylanicum*, *P. cordifolia*, *C.tora*, *A. vera* in various concentrations were evaluated and compared. The relative antioxidant activity was compared with the standard antioxidant activity of L-ascorbic acid⁵⁶. Another study showed that aqueous extract possesses strong antioxidant and antiradical activities⁵⁷.

DISCUSSION:

Reviewing all the Ayurvedic texts, found that almost all the references indicated that *Chakramarda* is described in the management of Skin Disorders. Charak Samhita and Sushruta Samhita have prescribed the *Chakramarda* in the form of *Lepa* as an external application. In *Chikitsa Grantha* the plant has been used in the form of external application as *Lepa*, Scrubbing powder, *Tail* (oil & cream) and Paste and Internal application as *Churna*, *Ghrit*, *Bhasma* and Decoction. Leaves have *Laghu Guna* and which pacifies *Vata*, *Pitta* and *Kapha*. Seeds have *Ushna Virya* and *Katu Vipaka*, which pacifies *Vata* and *Kapha*. According to *Dhanavantari Nighantu* seeds are also *Rakta Doshahar*. The whole plant is *Madhura* and *Tikta* in *Rasa*, *Laghu* and *Ruksha* in *Guna* which pacifies *Pitta* and *Vata*. In Skin disorders, aggravation or impurities of *Pitta* has occurred. Along with *Pitta*, there is an association of *Vata Dosha*. Due to *Vata Dosha Parushya*,

Itching, discolouration and scratching have occurred. Aggravated or impure *Pitta*, aggravate or impure the Blood. So, disturbed *Pitta* and impure blood cause all types of Skin disorders. In the management of Skin Disease, the very firstly pacification of *Pitta* is decided. The plant having *Pitta-Vata* pacifying properties has been frequently used in various skin diseases from time immemorial. That's why the plant is called Ringworm plant.

CONCLUSION:

Chakramarda (*Cassia tora* L.) is well known traditional medicinal plant, also called as Ringworm plant which possesses *Kusthaghna*, *Kandughna*, *Svitraghna* and *Dadrughna* properties. *Bhavaprakasha*, *Madanaphala* and *Kaidev Nighantu* have mentioned *Chakramarda* having *Krimighna* property. Preclinical studies suggested that *Cassia tora* has anti-fungal, anti-helminthic, anti-shigellosis, anti-bacterial, anti-itching, antipsoriatic, anti-oxidant and anti-inflammatory potential. These pharmacological properties are required parameters in the management of skin disorders. The author suggested that there is a requirement of further studies regarding skin care management and developing a potential drug for skin disorders.

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