

Therapeutic Efficacy of *Eranda* (*Ricinus communis* Linn.) in *Vata vyadhi*

Gyan Chand Kr. Morya^{1*}, Awanish Pandey¹, H.S. Mishra²,
R.B.Yadav³ and K.N. Yadav⁴

Abstract

Vata vyadhi is not a single disease but it is a group of disorders affecting all the systems of our body. Traditionally a large number of herbs are in use for the management of *Vata vyadhi*. *Eranda* (*Ricinus communis* Linn.) is one of them. The plant is widely used as an herbal medicine in *Vata vyadhi*. Classical properties according to vatika disorder is Vatahara (balancing effect), Udavartahara (relieves bloating, gas distension in abdomen), Plihaghana (useful in splenomegaly and spleen disorder), Gulmahar (useful in abdominal tumors), Bastishoolhar (relieves bladder pain), Antravruddhinut (useful in hernia), Shoshahara (useful in emaciation), Shoolaghana (relieves abdominal colic pain). The anti inflammatory activity is due to the presence of flavonoids. Alkaloids have been found to be responsible for both analgesic and anti-inflammatory action. The role of tannins and saponin in this plant shows anti-nociceptive and anti-inflammatory activities. The methanolic extract showed significant free radical scavenging activity by inhibiting lipid peroxidation. It also contains a toxin called ricin, possess antitumor qualities and recently has been used in chemotherapy of cancer. The present study is to explore the *Vata doshahar* properties of *R.communis* as anti inflammatory, analgesic, antioxidant, antitumor pharmacological properties.

Keywords

Vata vyadhi, *Antiinflammatory*, *Analgesic*, *Antitumor*, *Antioxidant*, *Anti-nociceptive*



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INTRODUCTION

Tridosha are the living entity of the body. *Vata* is the prime among *Tridosh*. *Vata* is controlling all the system of our body (CS.Su.12.8)¹. *Vata vyadhi* is not single disease but it is a group of disorders and affecting all the body system. *Vatika* disorder is a result of either *Dhatu kshay* (emaciation of vital element) or *Avaran janya* (systemic obstruction). Predisposing factors of the *Vata vyadhi* are changing life style due to modernization, stress, hectic schedule with indiscriminate dietary habits. Traditionally a large number of herbs are in use for the management of *Vata vyadhi*. *Eranda* (*Ricinus communis* Linn.) is one of them plant is still widely used herbal medicine in *Vata vyadhi* since ancient time. *Acharya charak* said that '*Eranda mulam vrishya vaat harananam*' (CS.Su.25.40)².

Botanical Name: *Ricinus communis* Linn.

English name: Castor **Family:**
Euphorbiaceae

Etymology:

The term *Eranda* is derived from "*Iryati vayum- irrkataau*"³ root word. That means which controls *Vata* and pacifies it called *Eranda*,

Synonyms:⁴

Gandharvahasta, Amanda, Citraka, Urubaka, Vyaghrapuccha, Panchangula, Vardhaman, Uttanpatraka, Vyadambaka.

Rasa panchaka (Classical properties):⁵

Rasa- *Madhur, Katu, Kshaya. Guna-* *Snigdha, Tikshna, Sukshma. Vipaka-* *Madhura. Virya-Ushna. Karma-* *Vatasamak, kaphsamak, krimi, mutkricch, arsh-gulma-basti shulhara, yakrit-pliha-udar-vibandhamavathar, amapachak.*

Parts used: Roots, seeds and leaves.

Doses: Root paste-10-20 gm. Seed-2-6(no.).
Oil- 4-16 ml.

Classical uses according to vatika disorder:⁶⁻⁷

Vatahara (balancing effect), *Udavartahara* (relieves bloating, gas distension in abdomen), *Plihaghana* (useful in splenomegaly and spleen disorder), *Gulmahar* (useful in abdominal tumors), *Bastishoolhar* (relieves bladder pain), *Antravruddhinut* (useful in hernia), *Shoshahara* (useful in emaciation), *Shoolaghana* (relieves abdominal colic pain), *Anahahara* (relieves gas, bloating), *Kati basti rujahara* (relieves lower back pain and bladder region pain), *Shiroruji* (relieves headache), *Amavatahara* (useful in rheumatoid arthritis), *Sothahara* (anti inflammatory).

Leiterary review:

1. *Angamarda prashaman mahakashaya* (group of herbs that relieve pain)⁸, *Swedopag mahakashaya* (group of herb useful in sweating treatment)⁸, *Bhedaniya mahakashya* (group of herb that cause purgation)⁸.

2. Castor oil is *tridoshar* (pacifies three aggravated doshas) and used as best purgative (SS.Su.13.12)¹.

3. Castor oil is used in gout, heart disease and chronic fever (CS.Su.27.289)¹.

4. In gout, to relieve pain, the paste of linseed or castor seed pounded with milk or satapuspa should be applied to the part of predominance of *vata* (CS.Ci.29.140)¹.

5. In *vataj gulma* castor oil mixed with clear wine or milk should take (CS.Ci.5.92)¹.

6. *Vidarigandhadi gana*⁹, *Adhobhagahara*^[9] (group of herb useful in elimination of morbid toxins from fecal route), *vata sansaman gana*⁹.

7. In *vata vyadhi* a preparation called '*Patralavana*' is recommended which is prepared as fresh leaves of *Eranda*, *Muskaka*, *Karanja*, *Vasa*, *Putika*, *Aragvadha*, *Chitraka* etc. are mixed with salt and pounded in mortar, then kept in a jar smeared with ghee which is pasted with cowdung and then put in fire (SS.Ci.4.30)⁹.

8. Castor oil taken with wine, curd water, milk and meat soup pacifies *vatika* flatulence (SS.Su.42.122)⁹.

10. In *vatika gulma* castor oil should be taken with wine, curd water, milk and meat soup (SS.U.42)⁹.

11. In sciatica and stiffness in thighs one should take castor oil mixed with cow's urine for a Month (V.M.22.60)¹⁰.

12. Taking gruel cooked with castor seeds, used for regains the normal movement in Sciatica (V.S.vata.588)¹¹.

13. Purified castor seeds pounded and cooked in milk is a good remedy for lumbago and Sciatica (V.M.22.50)¹⁰.

14. Castor oil mixed with decoction of *Dashmula* or *Sunthi* should taken in all types of lumbago (V.M.22.63 also B.P.Ci.26.55)¹⁰.

15. Castor oil mixed with equal quantity of *Nirgundi* juice overcomes *vata* situated in waist (V.D.12.8)¹².

16. In *padkantak* (sprained ankle) intake of castor oil is prescribed (V.M.22.61)¹⁰.

17. Patient suffering from *amavat*, sciatica and scrotal enlargement advised to take *Haritki* mixed with castor oil (V.M.25.11)¹⁰.

18. Castor oil acts like lion to kill the elephant like *Amavata* (BP.Ci.26.50)¹³.

19. In *Amavata*, fomentation with the decoction of *Eranda* of the affected part (BP.Ci.26.28)¹³.

20. In severe pain of *Amavata*, paste of *Sunthi* mixed with decoction of *Eranda* root cooked in enclosed heating should be used (S.G.2.1.43-44)¹⁴.

21. Tampon made of *Erand* seeds and cotton swab impregnated with castor oil should be put in vagina, relieves vaginal pain (G.N.6.6.8& 16)¹⁵.

22. In *Vatika abhishyand* (conjunctivitis) lukewarm goat's milk cooked with leaf, root or bark of *Erand* should be used (SS.U.9.11)⁹.

23. In *Vatika abhishyand* unctuous and hot lump made of leaf, root and bark of *Erand* destroys *vata* and pacifies *abhishyanda* (S.G.3.13.25)¹⁴.

24. In *Vatika timira*(deceptive vision) castor oil mixed with milk is efficacious (S.U.17.29)⁹.

25. The wound caused by *Vata*, should be covered with the leaves of *Erand*, *Bhurja*, *Putika*, *Asvabala*, and *Kasmari* (S.Ci.1.113)⁹.

26. In *Vatika* oedema mixture of ghee, oil, and fat or castor oil should be used for a month or a fortnight (S.Ci.23.11)⁹.

27. Castor oil mixed with decoction of *Dashmula* or *Triphala* added with cow's

urine alleviates *Vatodara*, oedema and pain (V.M.38.2)¹⁰.

28. Decoction of *sunthi*, root of *Bilva* and *Erand* and *Chitraka* added with *Hingu* and rock salt alleviates colic pain instantly (BP.Ci.30.57)¹³.

29. Pain in chest, heart, stomach alleviates decoction of *Erand* root added with *Yavakshar* (S.G.2.2.101)¹⁴.

Phytochemical constituents:

A phytochemical study on *R. communis* revealed the presence of steroids, saponins, alkaloids, flavonoids and glycosides. The dried leaves of the plant showed the presence of two alkaloids- ricinine (0.55%) and N-demethyl-ricinine(0.016%) and six flavones glycosides- kaempferol-3-O- β -D-xylopyranoside, kaempferol-3-O- β -D-glucopyranoside, quercetin-3-O- β -D-xylopyranoside, quercetin-3-O- β -glucopyranoside, kaempferol-3-O- β -rutinoside and quercetin-3-O- β -rutinoside^[15]. The monoterpenoids (1,8-cineole, camphor and α -pinene) and a sesquiterpenoid (β -caryophyllene), gallic acid, quercetin, gentisic acid, rutin, epicatechin and elingic acid are major phenolic compound isolated from leaves. Indole-3-acetic acid has been extracted from the roots. The seeds contain 45% of fixed

oil, which consists glycosides of ricinoleic acid¹⁶.

PHARMACOLOGICAL

ACTIONS

Anti inflammatory activity:

A study was carried on anti inflammatory effect of leaves and root extract of Castor in inflammation induced wistar albino rat models. Paw oedema formation by sub plantar administration of carrageenan, resulting the cellular changes into acute inflammation. The 250 and 500mg/kg dose of *R. communis* methanolic leaves extract possess protective effect in prevention of cellular changes during oedema formation. The anti inflammatory activity was due to the presence of flavonoids because the flavonoids have the protective effect against all the stages of acute inflammation. The effect of petroleum ether extract of root of *Ricinus Communis* (150mg/kg p.o) has been investigated against Carrageenan, 5-Hydroxytryptamin, Dextran, Bradykinin and Prostaglandin E, induced hind paw oedema. The extract exhibited significant anti-inflammatory activity against all the phlogestic agents except PGE. Mean changes in the paw volumes revealed, the efficacy of the extract against the phlogestic

agents in the decreasing order: Carrageenan→Bradykinin→5-HT→Dextran¹⁷.

Analgesic activity:

Alkaloids in Castor have been found to be responsible for both analgesic and anti-inflammatory activity. Flavonoids action on prostaglandins which are involved in the late phase of acute inflammation and pain perception. Saponin and terpenoid have also been reported to inhibit histamine release *in vitro*. A study was carried on analgesic property of aqueous root extract of wild and cultivated varieties of *R. communis* by using the tail flick method. In model rat, oral pre-treatment with wild variety of *R. communis* caused a profound significant analgesia and cultivated variety of *R. communis* caused a moderate analgesia. Tail flick method is behavioural methods that have been developed to study nociception in animals and giving information about the pain threshold¹⁸.

Antioxidant activity:

A study was also carried on free radical scavenging activities of the methanolic extract of Castor root in wistar albino rats. The extract showed significant free radical scavenging activity by inhibiting lipid peroxidation initiated by carbon

tetrachloride and ferrous sulphate in rat liver and kidney homogenates. The extract enhanced free radical scavenging activity of stable radical 2,2-diphenyl-1-picryl-hydrazyl (DPPH radical), nitric oxide and hydroxyl radical in vitro assay method by using lipid peroxidation and ferric thiocyanate method. The high antioxidant activity of the castor seed by methyl ricinoleate, ricinoleic acid, 12-octadecadienoic acid and methyl ester. The plant stem and leaves extracts also produce antioxidant activity due to the presence of flavonoids in their extract¹⁹.

Antitumor activity:

R.communis also contains a toxin called ricin, which possess antitumor activity and recently it has been used in chemotherapy of cancer. In vitro study ricin protein linked to the monoclonal antibodies to target cancerous cells recognized by the antibody. The resulting ricin-antibody conjugate produces immunotoxins.. By arming these antibodies with ricin, the deadly toxin can be carried directly to the site of the tumor in a cancer patient. Thus, ricin can destroy the tumor cells, without damaging other cells in the patient^[19]. Further study is also required in the perspective of safety and efficacy.

Antidiabetic activity:

A study was carried on antidiabetic activity of R.communis extract on diabetic rats for 20 days showed favorable effects not only on fasting blood glucose, but also on total lipid profile and liver and kidney functions on 10th and 20th day. After administration of the extract at a dose of 10g/kg body weight showed no statistically significant difference in alkaline phosphatase, serum bilirubin, creatinine, serum glutamate oxaloacetate transaminase, serum glutamate pyruvate transaminase and total protein. R.communis can be a promising herbal drug for the development of a potent phytomedicine for the diabetes²⁰.

Purgative activity:

Castor oil is one of the oldest remedie for everything from constipation to heartburn and widely used since ancient time and is still used these day; as valuable laxative. It is considered to be fast, safe and gentle, prompting a bowel movement in 3 -5 hours, affecting the entire length of the bowel, but not increasing the flow of bile, except in very large doses. It is recommended for both the very young and the aged patient. It is also used to clear the digestive tract in cases of poisoning²¹.

CONCLUSION

R. communis has therapeutic efficacy and known to possess anti inflammatory, analgesic, antioxidant, anti tumor, purgative activity. It has been used as potential *vata doshahar* herbs since ancient times. All evidence according to classical uses in Ayurvedic literatures strongly suggests about best *vata doshahar* properties. It is considered as a reputed remedy for all kinds of rheumatic affections. They are also useful in gastropathy such as gulma, amadosa, constipation, inflammations, fever, ascitis, bronchitis, cough, leprosy, skin diseases, and vitiated conditions of vata, colic and lumbago²². Although its preparation are popular among Ayurvedic physician in the management of *Vata vyadhi*, however my strong believe that further research should be carried on the properties of *R.communis*.

REFERENCES

1. Pandey Kashi Nath & Chaturvedi Gorakh Nath. 2009. *Charak Samhita of Agnivesh*. (CS)., Vidyotani Hindi Commentary, Chaukhamba Bharati Academy, Varanasi, India.
2. Shastri Ambika Dutta. 2011. *Sushruta Samhita of Sushruta*. (SS)., Ayurveda Tatava Sandipika Commentary, Chaukhamba Sanskrit Sansthan, Varanasi, India.
3. Bhav Mishra. 2013. *Bhava Prakash Nignantu*, Hindi Commentary Chuneker K. C., Chaukhamba Bharti Academy Guduchyadi verga. pg.286
4. Bhav Mishra. 2013. *Bhava Prakash Nignantu*, Hindi Commentary Chuneker K. C., Chaukhamba Bharti Academy Guduchyadi verga. verse. 60-62.
5. Sharma, P.V. 2006. *Dravaygun vigan*, vol-2, Chaukhamba Bharti Academy, Varanasi. pg.60-61.
6. Mahendra Bhaugik, Hri Dhanwantari Nighantu, Hri Hindivyakhya Pd.Hrihar Prasad Tripathi, Chaukhamba Sanskrit Series, Varanasi. 2008 Guduchyadi verga. Verse.287-288
7. Bhav Mishra. 2013. *Bhava Prakash Nignantu*, Hindi Commentary Chuneker K. C., Chaukhamba Bharti Academy, varanasi Guduchyadi verga. Verse.64-66.
8. Pandey Kashi Nath & Chaturvedi Gorakh Nath. 2009. *Charak Samhita of Agnivesh* Edt., Vidyotani Hindi Commentary, Chaukhamba Bharati Academy, Varanasi, India. C.Su.4.17, C.Su.4.13, C.Su.4.9.
9. Shastri Ambika Dutta. 2011. *Sushruta Samhita of Sharira* Edt. *Ayurveda* Tatava Sandipika Commentary, Chaukhamba Sanskrit Sansthan, Varanasi, India. S.Su.38.4, S.Su.39.4, S.Su.39.7.
10. Shri Vrinda, Vrindamadhava, Hindi commentary Prof.P.V.Tiwari, Chaukhamba Sanskrit Series, Varanasi.
11. Vangsen, Vangsen samhita, Hindi vyakhya Pd.Hrihar Prasad Tripathi, Chaukhamba Sanskrit Series, Varanasi
12. Kalidas, Vaidyamanorama, Sudha hindi commentary, Dr.H.L.Sharma, Chaukhamba Sanskrit Series, Varanasi
13. Bhav Mishra. 2013. *Bhava Prakash Nignantu*, Hindi Commentary Chuneker K. C., Chaukhamba Bharti Academy, varanasi
14. Sarangdhar, Sarangdhar samhita, Dipika hindi commentary, Tripathi Brahmdev, Chaukhamba Surbharati Prakashan, Varanasi,
15. Kang, S.S., Cordell, A., Soejarto, D.D., Fong, H.H.S., 1985. Alkaloids and

flavonoids from *Ricinus communis*. J. Nat. Prod. 48 (1), 155–156.

16. Darmanin S, Wismaver PS, Camilleri Podesta MT, Micallef MJ, Buhagiar JA. An extract from *Ricinus communis* L. leaves possesses cytotoxic properties and induces apoptosis in SKMEL- 28 human melanoma cells. Nat Prod Res 2009; 23(6): 561-571.

17. Ilavarasan R, Mallika M, Venkataraman S. Anti-inflammatory and free radical scavenging activity of *Ricinus communis* root extract. *Journal of Ethnopharmacology*, 103, 2006, 478-480

18. Doshi KA, Acharya R, Shankar BR, Nariya MB. Analgesic activity of wild and cultivated varieties of *Eranda (Ricinus communis* Linn.) root. Int J Green Pharm 2014; 8: 45-8.

19. Padma laxmikant ladda, et al / Int. J. of Res. in Pharmacology & Pharmacotherapeutics Vol-3(2) 2014. p.136-144.

20. Shokeen P., Anand P., Murali Y. K., Tandon V. 2008. Antidiabetic activity of 50% ethanolic extract of *Ricinus communis* and its purified fractions. In *Food and Chemical Toxicology*, vol.46, 2008, p.3458–3466.

21. Sorin Tunaru, Till F. Althoff, Rolf M. Nusing, Martin Diener and Stefan

Offermanns; Castor oil induces laxation and uterus contraction via ricinoleic acid activating prostaglandin EP3 receptors; PANS, June 5, 2012, vol.109, no.23, 9179-9184.

22. Morya Gyan Chand Kumar; Ayurvedic approach of *Eranda (Ricinus communis* Linn.) on *Vata Vyadhi* for Green Pharmacology, a paper presented in 6th International conference on Technology innovation and management for sustainable development: Towards greener, safer and smarter world on date 11.02.2016 at ITM University, Gwalior, M.P.