



## Ayurvedic Approach of Eranda (*Ricinus communis* Linn.) on Vata Vyadhi for Green Pharmacology

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**ABSTRACT:** *Vata vyadhi* (Neurological disorders) is not single disease but it is a group of disorders and affecting all the system of body. 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*. Classical properties according to vatika disorder is Vatahara (balancing effect), Udavartahara (relieves bloating, gas distension in abdomen), Pliaghana (useful in splenomegaly and spleen disorder), Gulmahar (useful in abdominal tumors), Bastishoolhar (relieves bladder pain), Antra-vruddhinut (useful in hernia), Shoshahara (useful in emaciation), Shoolaghana (relieves abdominal colic pain). A phytochemical study on *R. communis* revealed the presence of steroids, saponins, alkaloids, flavonoids and glycosides. Alkaloids have been found to be responsible for both analgesic and anti-inflammatory actions in some natural products. The role of tannins and saponin in anti-nociceptive and anti-inflammatory activities. Although it has a very potent poison ricin, has been shown to possess antitumor qualities and has been used in cancer research and chemotherapy during recent years. The present study was investigated to reveal the Vata dosahar properties of *R. communis* as anti-inflammatory, analgesic, antioxidant, antitumor pharmacological properties.

**Key words:** Erand (*Ricinus communis* Linn.), *Vata vyadhi* (Neurological disorders), Ayurvedic approach, Therapeutic efficacy.

### I. INTRODUCTION

*Vata*, *Pitta* and *Kapha* are collectively known as *Tridosh* [1]. These are living entity of the body and responsible for all functions of the body. *Vata* is the prime among *Tridosh*. *Vata* is controlling all system of our body. As described Acharya Charak – ‘*Vayu tantra yantra dhara*’ [2]. It means vata is controlling and maintaining factor of all the system of the body. In modern science nervous system is controlling part of the body. *Vata vyadhi* is not single disease but it is a group of disorders and affecting all the system of body. Neurological disorders are also affecting all the system of the body. 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*. Acharya Charak has mentioned that “*Erand mulam vrishya vata harananam*” [3], which means castor root is best useful in vata balancing effects and aphrodisiac.

### II. APPROACH AND PERSPECTIVE

**Erand (Castor)**

**Bot. name:** *Ricinus communis* Linn.

**Fam.:** Euphorbiaceae

**Morphology:** An evergreen, glabrous shrub, 2-4.5 m height. Leaves- palmately, 7- many lobed, lobes oblong to linear, acute or acuminate. Flowers-in large terminal subpanicked racemes; in a dense globose head of branched filaments and anthers; yellowish. Fruits- capsules, globosely oblong, smooth or echinate. Seeds- oblong, smooth, mottled. Flowers and fruits occur almost throughout the year.

**Rasa panchaka (Classical properties):**

**Ras-** 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 [4].

**Parts used:** Roots, seed and leaves.

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

**Classical properties according to vatika disorder:**

**Vatahara** (balancing effect), **Udavartahara** (relieves bloating, gas distension in abdomen), **Pliaghana** (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), *Shiro ruji* (relieves headache), *Amavatahara* (useful in rheumatoid arthritis), *Sothahara* (anti inflammatory) [5,6].

#### 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-demethylricinine (0.016%) and six flavones glycosides- kaempferol-3-O- -D-xylopyranoside, kaempferol-3-O- -D-glucopyranoside, quercetin-3-O- -D-xylopyranoside, quercetin-3-O-β-glucopyranoside, kaempferol-3-O- -rutinoside and quercetin-3-O- -rutinoside. The monoterpenoids (1,8-cineole, camphor and -pinene) and a sesquiterpenoid (-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 acid, isoricinoleic, stearic and dihydroxystearic acids and also lipases and a crystalline alkaloid, ricinine [7,8].

#### Pharmacological properties:

##### Anti inflammatory activity:

Anti inflammatory effect of the leaves and root extract were studied in wistar albino rats and paw oedema formation due to sub plantar administration of carrageenan, characterizing the cellular events of acute inflammation. The 250 and 500mg/kg dose of methanolic leaves extract possess protective effect in prevention of cellular events during oedema formation and in all the stages of acute inflammation. The anti inflammatory activity of methanolic extract was due to the presence of flavonoids. The effect of petroleum ether extract of root of *R. Communis* (150 mg/kg p.o) has been investigated against Carrageenan, 5-Hydroxy tryptamin, Dextran, Bradykinin and Prostaglandin E, induced rat's hind paw oedema. The extract exhibited significant anti-inflammatory activity against all the phlogestic agents except PGE. The anti-inflammatory activity was compared with standard drugs such as Phenylbutazone and Betamethasone, both in acute and chronic experimental models of inflammation in albino rats [9,10].

##### Analgesic activity:

Aqueous extract of plant showed, presence of secondary metabolites such as alkaloid, flavonoid, saponin, terpenoid, tannin, carbohydrate and glycoside in root of both cultivated and wild varieties

[11]. Alkaloids have been found to be responsible for both analgesic and anti-inflammatory actions in some natural products. Flavonoids are known to target 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*. To evaluate the analgesic property of aqueous root extract of wild and cultivated varieties of *R. communis* using the tail flick method of rats by oral pre-treatment with wild variety of plant caused a profound significant analgesia in the treated rats and cultivated variety of *R. communis* caused a moderate analgesia in the treated rats. Above procedure consists of behavioural methods that have been developed to study nociception in animals. Animal response in these tests is usually integrated at the lower levels in the central nervous system, thus, giving information about the pain threshold.

##### Antioxidant activity:

The methanolic extract showed significant free radical scavenging activity by inhibiting lipid peroxidation initiated by carbon tetrachloride and ferrous sulphate in wistar albino rats liver and kidney homogenates. The extract enhanced free radical scavenging activity of stable radical 2,2-diphenyl-1-picryl-hydrazyl (DPPH radical hot), nitric oxide and hydroxyl radical in vitro assay methods. *R. communis* seed extracts produced the antioxidant activity by using lipid peroxidation by ferric thiocyanate method and free radical scavenging effect on 2,2-diphenyl-1-picrylhydrazyl radical (DPPH) and hydroxyl radical generated from hydrogen peroxide. The high antioxidant activity of the seed which produce antioxidant activity are methyl ricinoleate, ricinoleic acid, 12-octadecadienoic acid and methyl ester and stem and leaves extracts also produce antioxidant activity due to the presence of flavonoids in their extract [12].

##### Antitumor activity:

It has a very potent poison ricin, has been shown to possess antitumor qualities and has been used in cancer research and chemotherapy during recent years. One of the most promising uses of ricin is in the production of immunotoxins, where the protein ricin is joined to monoclonal antibodies. The antibodies are produced in a test tube (in vitro) and have protein receptor sites that recognize the specific target cells of a tumor. The resulting ricin-antibody conjugate is called an immunotoxin. 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 [13].

**Antidiabetic activity:**

Administration of the effective dose of *R. communis* to the diabetic rats for 20 days showed favorable effects not only on fasting blood glucose, but also on total lipid profile. *R. communis* seemed to have a high margin of safety as no mortality and no statistically significant difference in alkaline phosphatase, serum bilirubin, creatinine, serum glutamate oxaloacetate transaminase, serum glutamate pyruvate transaminase and total protein was observed even after the administration of the extract at a dose of 10g/kg body weight. Thus, *Ricinus communis* seems to have a promising value for the development of a potent phytomedicine for the diabetes [14].

**Purgative activity:**

Castor oil was one of the old-fashioned remedies for everything from constipation to heartburn widely used since ancient time and is still used to this day; is the most valuable laxative in Ayurveda. 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. It is also used to clear the digestive tract in cases of poisoning. It should not be used in cases of chronic constipation [15].

**III. CONCLUSION**

Vatika disorder is a result of either *dhatu* kshay (diminution of vital element of the body) or *avarana janya* (obstruction of the body channels). Pain, stiffness, roughness, dullness, immobility, conduction defect, disturbed metabolism and many neurological diseases etc. are due to *vata vyadhi*. *R. communis* has therapeutic efficacy and known to possess anti-inflammatory, analgesic, antioxidant, anti tumor, purgative activity. These all are anti *vata* (stabilizing *vata dosha*) properties and *R. communis* used as potential *vata dosha* herbs since ancient times. It is considered as a reputed remedy for all kinds of rheumatic affections, neurological diseases, colic and lumbago. They are also useful in gastropathy due to vitiated conditions of *vata* such as *gulma*, *amadosa*, constipation, inflammations, fever, ascitis, bronchitis, cough, leprosy, skin diseases.

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