



An ethnomedicinal note on *Ricinus communis* L. (Family euphorbiaceae) in Tehri Garhwal, Uttarakhand

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Abstract

Ricinus communis L., commonly known as castor oil plant or Arandi, is a fast-growing, evergreen, perennial shrub found throughout India, mostly growing in wild on waste land, road sides, along ravines etc. It is cultivated in different states of India, like Rajasthan, Gujarat, Andhra Pradesh etc., for their valuable castor oil. The plant species is originated from the Ethiopian region of tropical East Africa and now found mostly in the sub-tropical and tropical regions of the world. *Ricinus* have been used in different recipes for ayurvedic and traditional medicines since ancient times. The present paper investigates deep into the ethnomedicinal properties of *Ricinus communis* L. We have tried to collect some medicinal recipes of castor plant from Vaidyas, old aged men and women, shepherds and tribal people of district Tehri Garhwal, Uttarakhand, India. Some of the important medicinal uses of this plant include the treatment of rheumatic arthritis, jaundice, skin ailments, stomach pain, intestinal worms, warts, fever, bladder inflammation, constipation etc. Authors suggest that more phytochemical and pharmacological studies on *Ricinus communis* L. are needed to confirm the medicinal uses of this plant. Authors believe the medicinal properties of the plant can be exploited commercially for the benefit of mankind.

Keywords: castor, ethnobotany, medicinal plants, euphorbiaceae, ayurveda, castor oil plant, arandi, erandi

Introduction

Ricinus L. is a monotypic genus belonging to the family Euphorbiaceae having only one species i.e. *Ricinus communis* L. This plant is commonly known as castor oil plant or castor plant worldwide. In India, the common names for the plant are Erand, Erandi or Arandi (Hindi, Urdu, Punjabi and Marathi), Amudana (Telugu), Andi (Garhwali), Bherenda (Bengali and Oriya), Harlu (Kannad) and Erri (Assamese) etc. The castor oil plant is native to the Ethiopian region of tropical East Africa [6]. The plant is an important oilseed plant commonly found in wild, wasteland and road sides in the subtropical to tropical regions around the world.

The plant is cultivated in some major states in India, like Gujarat, Rajasthan, Madhya Pradesh etc., for their commercially-valuable castor oil. India is the leading producer and exporter of castor oil in the world accounting approximately 83.65% of total global exports [4]. Castor oil find its commercial importance in the manufacturing of soaps, lubricants, hydraulic and brake fluids, paints, dyes, coatings, inks, cold-resistant plastics, waxes and polishes, nylon, pharmaceuticals and perfumes [7]. *Ricinus* is also an ecologically important plant as it easily grows in waste areas and debris, and thus helpful in binding the soil preventing soil erosion.

Uttarakhand is enriched with traditional medicinal knowledge, of indigenous rich flora of the state, possessed by the medicinal practitioners or Vaidyas, old men and women, Gujjars, Shepherds and tribal folk. Lying on the southern slopes of mid-Himalayas, Tehri Garhwal is one of the ecologically-diverse, hilly districts of Uttarakhand state. The local people have successfully preserved their culture and traditional knowledge almost intact. The flora of the

district includes the vast range found in the Himalayas, varying from the sub-tropical species which grow in the outer ranges of low hills to the rich alpine flowers in the north [2].

Though various ethnobotanical surveys have been conducted in the state, there is always more to discover when talking about the medicinal uses of the traditionally used medicinal plants. What are more important are the specific medicinal recipes of these plants traditionally used by the people for curing an ailment or providing a health benefit. *Ricinus communis* L. has been used in traditional medicine for ages in the treatment of various types of diseases and disorders, such as skin ailments, gastro-intestinal problems, joint pain, contraception etc. The plant has many medicinal properties and its different parts are used for different cures by the local inhabitants, migrating folk and tribal people. The authors have tried to collect some important lesser known medicinal uses and recipes of castor plant from common, village people of district Tehri Garhwal, Uttarakhand. Data collected enlists the medicinal uses of different plant parts of *Ricinus communis* L. for different ailments and health benefits of human, and the medicinal recipes associated with them.

Morphology

APG IV (2016) [1]

Clade: Angiosperms

Clade: Eudicots

Clade: Core eudicots

Clade: Super rosids

Clade: Rosids

Clade: Fabids

Order: Mapighiales

Family: Euphorbiaceae

Genus: *Ricinus*

Species: *Ricinus communis* L.

The family Euphorbiaceae is commonly known as the spurge family. It comprises of 228 genera and 6547 species worldwide [8]. *Ricinus* is a monotypic genus comprised of only one species i.e. *Ricinus communis* L. It is an erect, evergreen, suckering perennial shrub. It is a fast growing, monoecious, 1-6 m tall plant with alternate to opposite palmately lobed (5-12 deep lobes) leaves, 30-60 cm in diameter, narrowly peltate at base with coarse teeth along margins. Petioles bear 1-3 scattered nectaries on upper side adjoining the leaf blade. The stem turns red to woody-brown gradually. Inflorescences are 30-60 cm long panicles, terminal or laterally opposite to leaves, with 3-25 male cymes below and 1-7 female cymes above. Male flower 8-15 mm long pedicel, spathe-like yellowish-green to pale yellow sepaloid; stamens infinite, connate, ca 8 mm long, stipitate, cluster. Female flower 8-9 mm long pedicel, spathe-like sepaloid, globose ovary, densely echinate with soft spines, each ending in translucent stinging hair at apex; styles 3, entire or bifid. Fruit is a trilobed, ellipsoid to sub-globose schizocarp, covered with 3-6 mm long soft spines. Seed is ellipsoid to ovoid, shiny dark brown and white or mottled grey and brown along margins. The testa is very smooth, thin and brittle. Castor seeds have a warty appendage called the caruncle, which present usually at one end from which runs the raphe to terminate in a slightly raised chalaza at the opposite end of the seed [6].

Study Area

The present ethnobotanical study was carried out in 20 villages (Dharsal, Sondkoti, Badon gaon, Dargi, Semalta, Kemwal gaon, Manogi, Chaamni, Koldar, Kotdwar, Sursingdhar, Guldi, Nakot, Dikhola gaon, Saabli, Jaakh, Jaghdhar, Lamkot, Kathuli and Pathiana) in and around Badshahithaul, Tehri Garhwal (30.0873° N, 78.61422° E) lying in the north-western Himalayan region in Uttarakhand [3]. District Tehri Garhwal stretches from the snow clad Himalayan peaks of Thalaya Sagar, Jonli and the Gangotri group all the way to the foothills near Rishikesh [2]. The altitudinal range of the district is between 1600-1800 m a.s.l. The climate of the district is warm and temperate. The average annual temperature for the year 2020 was 19.8°C (minimum temperature attained throughout the year: 3°C, in January; maximum temperature: 31°C, in June); the annual rainfall averaged at 247.68 mm. The driest month of the year 2020 was October [5].

Methodology

Extensive and intensive field surveys were conducted in the study area to collect information of the ethno-medicinal uses of castor plant. This informative investigation was carried out through personal interviews with the local inhabitants, especially local *Vaidyas* or medicinal practitioners, old-aged men and women, Gujjars and shepherds. We have questioned 8-10 old-aged knowledgeable people from each village for proper data collection. The collected data was thoroughly compiled with the help of available relevant literatures. Primary data obtained from local informants was translated, compiled and listed in an efficient manner. Ailments being treated by the plant under study were counted upto 27 different health problems and benefits.

Results and Discussion

We found that the plant is a traditional medicinal ingredient used in the treatment of varied kinds of ailments such as arthritis, skin problems, as contraceptive, inducing labour pain, bladder inflammation, jaundice, bleeding gums, intestinal worms, colic in newborn, swollen lymph nodes, constipation, all kinds of aches etc. Some of the applications are for extra health benefits like promotion of hair growth, skin moisturizing, improving lactation in mothers etc. The plant parts used for the medicinal purposes are the seeds, leaves and roots. The common local names of the plant are 'andi' and 'arandi'. The local inhabitants, especially *Vaidyas*, shepherds and tribal folk from few villages, were found to be very resourceful and provided many medicinal recipes associated with the castor oil plant. However, people from many villages were completely unaware of the medicinal usefulness of the plant. The authors have gathered some very informational, medicinal uses of the plant lesser known among common citizens. Following are the ailments treated and health benefits gained from the usage of different plant parts of *Ricinus communis* L.:

1. Arthritis

The leaves and seeds of castor plant are used to give relief to the pain and stiffness of muscles as observed in arthritis. The plant has anti-inflammatory property which helps in reducing the swelling. Firstly, an oil (castor oil) massage is given to the affected area at bedtime. Then a poultice is prepared and applied by boiling a handful of castor leaves, putting it in a cloth and tying it up over the affected area. This poultice is kept overnight and the process is repeated daily for a week or two. Another medicinal recipe includes drinking a cup of warm milk with 1-2 teaspoon of castor oil and 2 tsp. of dry ginger before bedtime.

2. Muscle pain and soreness

Daily massages with castor oil relieve the muscle pain and soreness, and relieve the tensed muscles. Moreover, a poultice prepared from the seeds can also be applied over the aching body part. It is prepared by grinding some castor seeds, adding water and spreading the paste on a cloth and wrapped over the affected area. Placing a hot water bottle over this cloth helps to provide heat which in turn enhances the effect of the poultice applied.

3. Skin dryness and cracked heels

Castor oil has excellent moisturizing effect on dry skin. A light daily massage heals skin dryness, and applying it over cracked heels daily after washing the feet before bedtime repairs the skin in 3-4 weeks.

4. Stretch marks

Daily massage with the castor oil reduces the visibility of stretch marks.

5. Boils

Seeds, leaves and roots, all are individually helpful in curing boils. Applying the paste of roasted castor seeds and mustard oil is helpful in treating a boil. Leaves of castor plant are also helpful in curing boils. Leaves poultice is prepared by crushing leaves, frying in castor oil, spreading on cloth and applied on skin for 30-60 minutes. Root decoction can also be applied topically over boils. It is

prepared by boiling some dried castor roots with 1-4 L water for 1-2 hours and reducing it to a cup of liquid.

6. Sunburns

Skin hyper pigmentation, redness and inflammation caused due to Sun damage are also treated by applying castor oil overnight regularly.

7. Warts

Skin tags or warts can be dried out and removed off the body by cleaning them with a mixture obtained by dissolving *desi Kapoor* with 8 tablespoon of warm castor oil.

8. Ringworms and other skin infections

Various skin infections are treated by putting a thin layer of castor oil over the affected area daily. Leaves poultice is also used by grinding some castor leaves, frying them in castor oil and spreading on a cloth. The cloth is put over the infected skin and visible changes can be observed within a week.

9. Irritation in eyes

Dry eyes or irritated eyes due to dust can be treated by putting 2-3 drops of castor oil in the eyes.

10. Stomach pain, colic in newborns and flatulence in children

Drinking lukewarm water with 2 tablespoon of castor oil and lemon juice regularly helps to alleviate chronic stomach pain. Root decoction, prepared by boiling some dried castor roots with 1-4 L water for 1-2 hours and reducing it to a cup of liquid, is taken to get relief from stomachache. Abdomen pain due to gastric trouble is treated by massaging mix of castor oil and home-made butter over the belly. A gentle, hand-warmed castor oil massage over abdomen is helpful to cure colic in newborn children. Flatulence in children can be treated by putting warmed, castor oil-coated castor leaves on the abdomen area.

11. Constipation

The plant has purgative effect and is thus used as a laxative. Taking 1-2 tablespoon of castor oil with lukewarm milk at night is helpful to treat chronic constipation. Using cloth smeared with a poultice prepared by crushing castor leaves and then frying them in castor oil and applying the cloth over abdomen for 30 minutes daily helps to cure constipation.

12. Intestinal worms

50 gm of dried castor roots is boiled with 2 cups of water until only a cup is left. This decoction is taken daily for 3 days. One tbsp. of castor oil in a cup of warm milk is taken in the morning and at night. The worms will be passed out of the system due to the laxative effect of the plant.

13. Jaundice

The leaves from castor plant are very helpful in curing jaundice during early onset. Leaves decoction is prepared by grinding a handful of castor leaves and boiling them in 1-4 L. water for 1-2 hrs. This decoction is advised to drink twice a day.

Another method is extracting castor leaf juice, mixing some water and drinking it twice daily. Yet another one involves orally taking fine paste of a handful of castor leaves empty stomach in the morning.

14. Fever

Root decoction is used to induce sweating to bring down the temperature in fever.

15. Bladder inflammation and urinary retention

Root decoction is taken daily to promote urination.

16. Opium poisoning

Fresh juice of castor leaves is administered to the patient. It is used as an emetic.

17. Abdomen obesity

Drinking root decoction twice a day is advised to reduce the central obesity. The decoction is prepared by taking 20 gm of dried castor roots, making a powder and boiled in 4 cups of water till a cup is left. Two tbsp. of castor oil is mixed before drinking it.

18. Rigid knees

A handful of castor leaves are crushed and added to a cup of sesame oil. The mixed oil is strained through a cloth and massaged gently to the knees.

19. Sciatica pain and backache

The castor seeds are useful to alleviate the sciatica pain when used regularly. Outer coat of a seed is removed and the rest is grinded and added to a glass of milk. This drink is taken regularly for best results.

20. Swollen lymph nodes

Rubbing castor oil over the affected area daily helps in slowly shrinking the size of the swollen part. The oil facilitates the circulation in the lymphatic system.

21. Headache

Crushed castor leaves, fried in castor oil, spread on a clean cloth and applied on forehead. This cloth is kept for 30 minutes.

22. Joint pain

The poultice prepared by crushing castor leaves and frying this in castor oil only. The poultice is smeared on a cloth and then kept on the painful joint for an hour.

23. Bleeding gums

Taking 1 tsp. of castor oil with warm milk before bed at night is helpful to cure the problem of bleeding gums.

24. Promoting hair growth

Massaging mustard oil mixed with 4-5 drops of castor oil directly onto the hair follicles helps to promote the hair growth. It also moisturizes the hair ends, when applied to the whole length, thereby conditioning the hair, making them less frizzy and dry.

25. As contraceptive

Castor seed provides contraceptive effect when taken orally. The outer coat of a seed is removed and the whole seed is then taken orally for its contraceptive effect. One seed is thought to prevent pregnancy for almost a year.

26. Inducing labour pain in pregnant ladies

One of the most renowned medicinal use of castor oil is to induce labour pain in pregnant women. The patient is

administered 60 ml of castor oil once or a second dose of the same is given next day to induce labour pain for delivery of a child. This method is also in common practice in local hospitals.

27. Improving lactation

Applying castor leaves poultice to breasts is said to improve lactation in mothers. The poultice is prepared by crushing leaves, frying them in castor oil and smearing it on a cloth, and kept on the area for 30 minutes daily. Another method uses warmed castor leaves directly applied over breasts.

Conclusion

From the study we can conclude that *Ricinus communis* L. has a very high medicinal value. Rural areas were found to be main repositories of traditional knowledge. However, authors found a lack of this ethnomedicinal knowledge about castor oil plant in many villages studied. It can be concluded from the study that storehouse of ethnomedicinal information of wide-range medicinal uses of *Ricinus communis* L. are under threat due to lack of knowledge transmission and its inadequate exploitation among people of different generations and even from different villages. Such vital knowledge is disappearing because the young who are in contact with outside world have adopted an attitude that traditional ways are irrelevant and illegitimate. Proper awareness camps are needed to educate people about the medicinal usefulness of this plant in different villages of the study area. Moreover, *Ricinus communis* L. has an excellent capacity for the development of new efficacy medicinal drugs in coming years. However, it is worth mentioning here that before any ethnomedicinal formulation is fully put to use and commercialized, it needs to be thoroughly investigated in terms of its chemical composition and concentration of different constituents. Clinical trials are required to ascertain the physiological effects of different components of formulation and to arrive at the exact effective dosage. The authors suggest that more phytochemical and pharmacological studies on *Ricinus communis* L. are needed to confirm the medicinal uses of this plant and commercial application to the development of new medicinal drugs further. We believe the medicinal properties of the plant can be exploited commercially for the betterment of mankind.

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