International Journal of Economic Plants 2015, 2(2): 079-082

SECTION : REVIEW

Medicinal Uses of Castor Plant

A. V. Ramanjaneyulu[1*] and N. Madana Gopal[2]

[1]Regional Agricultural Research Station (Professor Jayashankar Telangana State Agricultural University), Palem, Mahabubnagar district, Telangana state (509 215), India
[2]Santhiram College of Pharmacy, Nerawada Metta, NH-18, Nandyal, Kurnool district, Andhra Pradesh (518 501), India

Article History

Manuscript No. IJEP32
Received in 18th March 2015
Received in revised form 12th April 2015
Accepted in final form 28th April 2015

Correspondence to

E-mail: avr_agron@rediffmail.com

Keywords

Castor, eye infection, medicinal uses, sexually transmitted diseases

Abstract

Castor (*Ricinus communis* L.) is one of the ancient and important non-edible oilseed crops. Different parts of castor plant gained importance because of their utilization for medicinal uses. The leaf can be used in the treatments related to antiviral, biliousness, burns, ear and head ache, malaria and night blindness while stem is used to treat cancer and hypoglycemia. The flowers can be utilized against glandular and vaginal pain. Fruits are used for curing tumors, treating piles, liver and spleen diseases. Root bark is used as purgative, in abortion, ascites, asthma, bronchitis, carination, hypoglycemia, leprosy, pains, rectum and rheumatism diseases. Hence, an attempt was made to document innumerable uses of castor medical sector in medical field.

1. Introduction

Castor (*Ricinus communis* L.) belongs to the spurge (Euphorbiaceae) family. It is believed to have originated from Ethiopia (Africa) and India. The genus *Ricinus* is monotypic with *R. communis* is the only one species. Both *Ricinus* and *communis* are Latin words. *Ricinus* is a tick and is the specific epithet for the Mediterranean sheep tick (*Ixodes ricinus*) and *Communis* means common. The name *Ricinus* was coined by Caroleus Linnaeus, father of taxonomy as castor bean seeds resemble blood sucking 'tick' (mottled body of certain ticks), particularly large ticks engorged with blood. Though the plant is often called as castor bean plant and seed as castor bean, but, it is not a legume plant.

Castor is one of the ancient and most important non-edible oilseed crops having immense industrial and medicinal value (Anjani, 2012). It is grown across the world in tropical, sub-tropical and warm temperate regions (Weiss, 2000). Castor is cultivated across 30 different countries, of which India, China, Brazil, Mozambique, Ethiopia and Thailand are the major ones accounting for about 90% of the worlds' production. Now, India accounts for nearly 66.5 and 82.9% of world's castor area and production, respectively. India ranked first in area (1.15 mha), production (1.96 mt) and productivity (1711 kg ha^{-1}). In India, castor is cultivated across 13 states, however, only three states viz., Gujarat (78.3%), Rajasthan (15.6%) and erstwhile Andhra Pradesh (4.73%) together contribute 98.63% of the total production of castor (FAOSTAT, 2013; Ramanjaneyulu et al., 2013).

Among different parts of castor plant, seed is the most important economic product. Castor oil is a vegetable oil obtained by crushing its' the seeds (Thomas, 2005). The castor seed contains 48–52% oil and has tremendous value. Other parts of the plants like leaves, stems, flowers, fruits and roots also either alone or in combination with other products find various applications in medical field as enumerated below.

2. Medicianal Uses

India has a history of using different plants in its indigenous systems of medicine (Ayurveda, Unani and Siddha) that dates back to 5000 years. Ayurveda records over 8000 herbal remedies. About 6000 plants were used in traditional, folk and herbal medicines in India (Huxley, 1984). Different parts of the plant or oil from castor can be used as a base material in most of the medicinal treatments. For eg., the leaf can be

used in the treatments related to antiviral, biliousness, burns, ear and head ache, malaria and night blindness while stem is used for treatment of cancer and hypoglycemia. The flowers can be utilized against glandular and vaginal pain. Fruits are used for curing tumors, treating piles, liver and spleen diseases. Root bark is used as purgative, in abortion, ascites, asthma, bronchitis, carination (expulsion of gas from stomach and intestines), hypoglycemia, leprosy, pains, rectum and rheumatism diseases (Borthakar, 1981).

2.1. Eye infection

Conjunctiva is a thin and delicate membrane that covers the eyeball. Conjunctivitis is the inflammation of the conjunctiva, characterized by redness and often accompanied by a discharge. It is a common eye problem when eyes are exposed frequently or continuously to microorganisms and environmental conditions that can cause infections or allergic reactions. It can be acute or chronic depending on severity of symptoms and the type of organism or agent involved. It can be very easily transmitted to others during close physical contact, particularly among children (Prewitt, 2004). Leaf decoction of *Achyranthes aspire* mixed with castor oil can be applied on the head and body an hour before head bath to overcome the problem of conjunctivitis.

2.2. Skin diseases

Eczema or atopic dermatitis is a form of chronic inflammation of the skin characterized by redness, itching and oozing vesicular lesions (Armstrong and Johnson, 2011; Bershad, 2011). Other symptoms include skin edema (swelling), itching and dryness, crusting, flaking, blistering, cracking, oozing or bleeding (Johannes et al., 2006). Powder of Indian birthwort (*Aristolochia indica*) along with the oil prepared from boiling *Datura stramonium* leaf juice is mixed with castor oil and is applied on the skin against eczema.

Filariasis is a parasitic and infectious tropical disease caused by filarial nematode worms and is transmitted by mosquito bites. The most spectacular symptom is elephantiasis-edema with thickening of the skin and underlying tissues. It affects mainly the lower extremities, while the ears, mucus membranes and amputation stumps are affected less frequently. Castor seed paste is applied on effected part (feet) against filariasis.

Castor oil is mixed with copper sulphate and is used to treat various skin ailments. Pounded leaves of *Alangium salvifolium* are mixed in castor oil and bandaged on the affected part of inflammation. Psoriasis is a chronic skin disease characterized by dry red patches covered with scales and it occurs especially on the scalp, ears and genitalia and the skin. The leaf of *Aristalochia bracteata* along with the rhizome of *Curcuma domestica* and seed of *Piper nigrum* are mixed with cow urine and made into a paste and boiled in castor oil. Such mixture is to be applied on the affected part of psoriasis regularly.

2.3. Liver disease

Jaundice is yellowing of the skin and eyes and occurs due to presence of too much bilirubin in the human body. Bilirubin is a yellow pigment which is formed due to breakdown of dead red blood cells in the liver. Jaundice is an indication of malfunctioning of liver, gallbladder, or pancreas. Tender castor leaf paste along with coconut water is orally administered to the patients suffering from jaundice.

2.4. Sexually transmitted diseases (STDs)

STDs are also known as sexually transmitted infections (STI) and are transmitted between humans by means of sexual behavior. Some are transmitted due to reuse of drug needles after their use by an infected person, through childbirth or breastfeeding. Castor oil packs will improve White and red blood cell (WBC and RBC) count within two weeks thus improves the immune system in human body. Castor oil with arsenics and copper sulphate are used in the treatment of syphilis and gonorrhea. Though no. of drugs exist that can improve lymphatic flow, this task can easily be performed by topical application of castor oil. When castor oil is absorbed through the skin, the lymphocyte count of the blood increases. This is a result of a positive influence on the thymus gland and/or lymphatic tissue. The flow of lymph increases throughout the body which inturn speed up the removal of toxins and reduces the size of swollen lymph nodes resulting in overall improvement in organ function.

2.5. Miscellaneous

Castor oil is a well-known general laxative useful in treating painful defecation called constipation. In rural areas, small quantity of castor oil is given to children's suffering from constipation which facilitates bowel movement.

Warm leaf paste of castor plant is applied on the forehead to cure head ache. Leaf juice of *Eclipta prostrate* is mixed with castor oil and applied on the head to reduce the problem of dandruff. Leaf extract of *Abrus precatorius* boiled in equal quantity of castor oil and is applied to hair regularly for proper hair growth. Mixture of fruit juice of *Gmelina asiatica* and castor oil is boiled and used as hair tonic for better hair growth.

Paralysis is the sensory loss of muscle function. A table spoon of ash obtained by burning the castor leaves is mixed with honey and given as diet to the affected patients (Kavita et al., 2010). Castor oil ground with niger seed is applied externally to cure piles and fistula. Rheumatism or rheumatic

disorder is a non-specific term for medical problems affecting the joints and connective tissue. Crushed leaves of *Cardiospermus halicacabum* or *Calotropis gigantean* or *Delonix alata* along with castor oil are bandaged on the tumours and rheumatic swellings.

Ricinoleic acid has been shown to be effective in preventing the growth of numerous species of viruses, bacteria, yeasts and molds. This will explain high degree of success in the topical use of the oil for treating ailments such as ringworm, keratoses (non-cancerous, wart-like skin growths), skin inflammation, abrasions, fungal-infected finger and toe nails, acne and chronic pruritus (itching). The concerned area has to be simply wrapped with castor oil soaked cloth or band-aid.

Therapeutically, modern drugs are rarely given in a pure chemical state. Most of the active ingredients are combined with additives. Castor oil or a castor oil derivative such as Cremophor EL (polyethoxylated castor oil, a non-ionic surfactant), is added to many modern drugs including

- Miconazole, an antifungal agent (Fromtling, 1988)
- Paclitaxel, a mitotic inhibitor used in cancer chemotherapy (Micha et al., 2006).
- Sandimmune (cyclosporine injection, USP), an immunosuppressant drug widely used in connection with organ transplant to reduce the activity of the patient's immune system (Zhang et al., 2001).
- Saperconazole, a triazole antifungal agent (contains Emulphor EL-719P, a castor oil derivative) (Sugar et al., 1994).
- Tacrolimus, an immunosuppressive drug (contains HCO-60, polyoxyl 60 hydrogenated castor oil)
- Xenaderm ointment, a topical treatment for skin ulcers (a combination of Peru balsam, castor oil and trypsin) (Beitz, 2005).

3. Conclusion

The castor plant has been proved to be a versatile and unique non-edible oil plant with diversified uses. In view of increasing demand for castor oil, there is an immense need to increase its' cultivation in the country. However, upcoming of alternate remunerative crops like Bt cotton and maize across the castor growing zones in India have pushed the castor to the backstage. However, keeping in view wide array of uses of castor plant, there is s a need to conserve germplasm and promote the crop on a large scale.

4. Future Perspectives

There is a need to improve area, production and productivity of castor by expanding the crop to new niches like non-traditional areas, rice fallows, post-monsoon season and also to the areas with irrigation water shortage and persistence of wild boar problem. Besides, site specific land configuration and management strategies for effective soil and moisture conservation in dry lands and adoption of micro-irrigation methods will certainly help improve the productivity. Inter institutional linkages must be established among Indian Council of Medical Research (ICMR), Indian Council of Agricultural Research (ICAR) and private industries to work in tandem with each other to strengthen medical sector through innovative action plan.

4. References

Anjani, K., 2012. Castor genetic resources: a primary gene pool for exploitation. Industrial Crops and Products 35, 1–14.

Thomas, A., 2005. Fats and fatty oils in ullmann's encyclopedia of industrial chemistry. Wiley-VCH, Weinheim, doi: 10.1002/14356007.a10_173.

Armstrong, A., Johnson., 2011. Conquering Eczema (Video, Text). UCDMC Dermatology, Beitz, J.M., 2005. Heparin-induced thrombocytopenia syndrome bullous lesions treated with trypsin-balsam of peru-castor oil ointment: a case study. Ostomy Wound Management 51(6), 52–54, 56–85, PMId 16014993.

Bershad, S.V., 2011. In the clinic. Atopic dermatitis (eczema). Annals of Internal Medicine 155(9), ITC51-15; quiz ITC516, doi: 10.1059/0003-4819-155-9-201111010-01005, PMID 22041966.

Borthakar, S.K., 1981. Studies in Ethnobotany of the Karbis (Mikirs), Plant masticatories and dyestuffs. In: Jain, S.K. (Ed.), Glimpses of Indian Ethnobotany, 182−190.

FAO STAT, 2013. Food and Agricultural Organization, Rome. http://www.faostat.fao.org.

Fromtling, R.A., 1988. Overview of medically important antifungal azole derivatives. Clinical Microbiological Reviews 1(2), 187–217, PMC 358042, PMID 3069196.

Huxley, A., 1984. Green Inheritance: The World wildlife fund book of India, Collins/Harvel, London, 1984.

Johannes, R., Bernhard, P., Thomas, R., 2006. Handbook of atopic eczema. Birkhauser, p.4. ISBN 978-3-540-23133–2.

Kavita, K., Vijaya, H., Bharti, C., Patil, B.R., 2010. Traditional uses of castor (*Ricinus communis* L.). Journal of Oilseeds Research 27(Special issue), 325–327.

Micha, J.P., Goldstein, B.H., Birk, C.L., Rettenmaier, M.A., Brown, J.V., 2006. Abraxane in the treatment of ovarian cancer: the absence of hypersensitivity reactions. Gynecologic Oncology 100(2), 437–438. doi:10.1016/j.

ygyno. 2005.09.012. PMID16226797.

Prewitt, D., 2004. Keep an Eye toward the Nose: These treatments can help stop the charge of Rhinoconjunctivitis. Review of Optometry 15, 125–127.

Ramanjaneyulu, A.V., Vishnuvardhan Reddy, A., Nagesh Kumar, M.V., Gouri Shankar, V., Dharma Reddy, K., 2013. Development and diffusion of *rabi* castor technology. Technical Bulletin 01/Castor/RARS (ANGRAU), Palem 509 215, Mahabubnagar district, Andhra Pradesh, 1–30.

Sugar, A.M., Salibian, M., Oldani, L.Z., 1994. Saperconazole therapy of murine disseminated candidiasis: efficacy and interactions with amphotericin B", Antimicrob. Agents. Chemotherapy 38(2), 371–373, PMC 284460. PMID 8192469.

Zhang, K.E., Wu, E., Patick, A.K., 2001. Circulating metabolites of the human immunodeficiency virus protease inhibitor nelfinavir in humans: structural identification, levels in plasma and antiviral activities. Antimicrobial Agents and Chemotherapy 45(4), 1086–1093. doi:10.1128/AAC.45.4.1086-1093.2001. PMC 90428. PMID 11257019.

Weiss, E.A., 2000. Oilseed crops. 2nd Ed. Blackwell Science, Oxford, UK.