



## Case Report

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# Exposure to *Snuhi Ksheera* (*Euphorbia caducifolia* Haines. latex) resulting in ocular injury: A case report

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## ABSTRACT

**Objective:** To report the case of *Snuhi Ksheera* (*Euphorbia caducifolia* Haines. latex) exposure causing ocular injury. **Design:** Single case study. **Setting:** Shalakyatantra department, IPGT & RA, Jamnagar, Gujarat, India. **Case:** A 28 year old male research scholar complaining of acute severe pain in right eye with a history of accidentally touched *Snuhi Ksheera* with his gloved hand during the preparation of *Ksharasutra* (medicated caustic thread). **Interventions:** Patient was treated with topical steroid and antibiotic drops along with *Ghrita Manda* (supernatant layer of ghee) as eye drops. Patient was observed until all sign and symptoms had resolved. **Main Outcome Measures:** Symptoms, visual activity and clinical signs of inflammation. Patient provided a specimen of the plant for formal identification. **Results:** Initial symptoms were burning, redness, irritation, lacrimation and stinging pain with blurred vision. All signs and symptoms had resolved within 3 days. There was moderate lid edema and conjunctival congestion. On examination, the patient had a visual acuity of 6/12 in right eye and intraocular pressures were 13.9 mmHg bilaterally. **Conclusion:** Individuals who work with *Euphorbia* plants should be cautioned to wear eye protection and gloves. Our suggestion for managing of *Snuhi ksheera* (*Euphorbia* sap) ocular injury is administered drops of *Ghrita Manda* as supportive therapy.

**Keywords:** *Euphorbia caducifolia*, Ocular injury, Side effects, *Snuhi Ksheera*.

## INTRODUCTION

The Euphorbiaceae are mostly monoecious herbs, shrubs, and trees, sometimes succulent and cactus-like, comprising one of the largest families of plants with about 300 genera and 7,500 species that are further characterized by the frequent occurrence of milky sap.<sup>[1]</sup> *Euphorbia caducifolia* Haines. grows in stony ground on barren coastal plains and in the hilly tracts of the Indian desert on well-drained limestone soils as well on sandy soil, and therefore the substrate varies from slightly alkaline to slightly acidic.<sup>[2]</sup> It is popularly known as *Thor*, *Danda-thor* and leafless Milk Hedge.<sup>[3]</sup> Species of *Euphorbia* grow in India, either wild or as cultivated specimens in the house or garden.<sup>[4]</sup> *E. caducifolia* is considered poisonous and not used as food or fodder except for the juicy leaves, which can be consumed as a vegetable. Latex is present in great abundance in the entire plant.<sup>[5]</sup> The latex or sap of many *Euphorbia* plants is toxic and may cause inflammation of skin<sup>[6]</sup> and the eye<sup>[7,8]</sup> on contact. The spectrum of ocular injuries from the family of Euphorbiaceae consists of contact or photo dermatitis, conjunctivitis, mild to severe keratitis, corneal ulceration, uveitis with hypopyon, corneal scarring, miosis and blindness.<sup>[9,10]</sup> Ocular inflammation varies from a mild conjunctivitis to severe keratouveitis and there have been several case reports of permanent blindness resulting from accidental exposure to the sap.<sup>[11]</sup> If cornea is involved, changes generally follow a typical sequence with worsening edema and epithelial sloughing on the second day.<sup>[11,12]</sup> When treated early and managed appropriately, cases generally resolve without sequelae.<sup>[13]</sup>

Beside these hazardous effects, the latex of *E. caducifolia* is considered to have medicinal value and used by shepherds and local inhabitants for treating bleeding wounds caused by accidental injury.<sup>[5]</sup> It is also used to cure the skin infections, cutaneous eruption, leukoderma, applied to cuts and wounds for speedy healing, earache and to expel guinea worms.<sup>[5,14]</sup> *Snuhi* (*E. caducifolia* Haines.) is one among the *Upavisas* (the group of drugs which were less toxic in nature and not so lethal but produces certain toxic symptoms

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on consumptions or administration) and a well-known plant in Indian system of medicine. *Snuhik ksheera* is used in the formulations after only proper *Shodhana* (purification / detoxification) in *Chinchapatra Swarasa* (*Tamarindus indica* leaves juice).<sup>[15]</sup> It is used as *Bhavana Dravya* in most of the *Vati* (tablets), *Varti* (suppositories) and *Rasa aushadhies* (herbomineral compound formulation).<sup>[16]</sup> *Ksharasutra* is a medicated device or an Ayurvedic cutting set on or coated thread prepared by repeated smearing of latex of *E. caducifolia* or *E. nerifolia* plant, alkali of *Achyranthes aspera* plant and turmeric powder on a 20 zero Barber's surgical linen thread.<sup>[17]</sup>

In present study, ocular toxicity caused by *Euphorbia caducifolia* Haines. Latex that used in the preparation of *Ksharasutra* (medicated caustic thread) in Indian system of medicine in Jamnagar, India was reported.

## CASE REPORT

On 14<sup>th</sup> February 2017, a male research scholar of 28 year old presented with the case No. 96738 to the OPD of Shalakyatantra, Institute for Post Graduate Teaching and Research in Ayurveda, Gujarat Ayurved University, Jamnagar, India complaining of acute severe pain in right eye. He gave a history of accidentally touched *Snuhi Ksheera* (*Euphorbia caducifolia* Haines. latex) in his right eye with his gloved hand during the preparation of *Ksharasutra*. He experienced severe burning sensation, redness, foreign body sensation, blurring of vision and marked lacrimation despite immediate rinse with tap water. He administered eye drops of *Ghrita Manda* (supernatant layer of ghee) as supportive therapy to overcome the pain. He had no past history of ocular trauma, ocular surgery, glasses, or contact lens wear. Past medical history was unremarkable, and he was not on any medications.

He was assessed by an ophthalmologist later the same morning. The eye was painful and there was marked lacrimation. There was moderate lid edema and conjunctival congestion with mild chemosis (Figure 3). Immediately Proparacaine (0.5%) (pH 3.5 to 6.0) local anaesthetic eye drops are used to reduce eye pain, which can help in better eye opening for detailed examination. After that copious irrigation with Ringer's solution (pH 7.3-7.4) was done for 20 minutes up to achieve physiological pH level. After irrigation, eye was again checked for any remnants of the sap of euphorbia at bulbar and palpebral part of the conjunctiva. A sterile ear bud was also passed in both the fornix for removal of any debris.

On examination, the patient had a visual acuity of 6/12 in right eye (RE) and 6/6 in the left eye (LE) with his spectacles using the Snellen's visual acuity chart at distance. Slit lamp examination revealed no signs of corneal edema, and the anterior segment was quiet. His LE was within normal limits and the RE showed marked congestion at bulbar and palpebral conjunctiva in green filter (Figure 4, 5). There is no signs of iridocyclitis like aqueous flare or cells in anterior chamber. No conjunctival and limbal ischemia was found while performing slit lamp examination. Fluorescein staining was negative hence it can be assumed that corneal epithelium was intact. Intraocular pressures was 13.9 mmHg bilaterally.

He was treated with ofloxacin (0.3% w/v) and prednisolone acetate (10 mg/10 ml) eye drops for four times daily. The patient was observed closely as an outpatient. On next day, the pain was less marked but swelling was seen in lower eyelid and nasolacrimal duct. On 3<sup>rd</sup> day all signs and symptoms were resolved and patient regained 6/6 vision bilaterally with his own spectacles. The offending plant was presented to the Pharmacognosy Laboratory, IPGT & RA, Gujarat Ayurved University, Jamnagar and was subsequently identified as *Euphorbia caducifolia* Haines. also known as the *Thor* in local language (Figure 1, 2).



Figure 1: Natural habitat of *Snuhi* (*Euphorbia caducifolia* Haines.)

Figure 2: Latex of *Euphorbia caducifolia* Haines.



Figure 3: Moderate lid edema, conjunctival congestion with mild chemosis and inflamed tear duct after half hour of exposure to *Euphorbia* sap

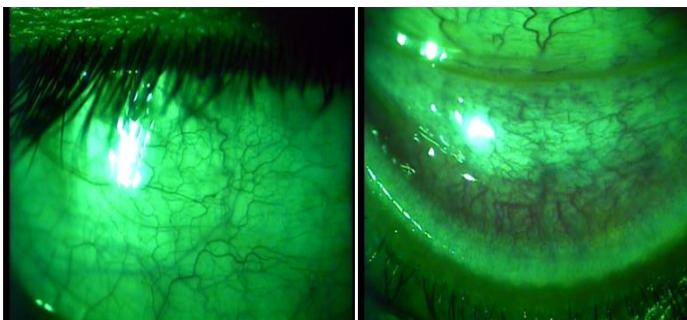


Figure 4: Bulbar congestion

Figure 5: Lower palpebral congestion

## DISCUSSION

Euphorbiaceae is one of the largest of the plant families and includes thousands of plants found all over the world. They are distinguishably different by their peculiar flower and milky latex that contains irritant and carcinogenic diterpine esters.<sup>[18]</sup> Sticky milky latex of *Euphorbia* plants flows out in abundance when a slight injury is caused to the phylloclade. The latex is reported to have phyosterols and triterpenes (euphol, tirucalol, Cycloartenoland cyclocaducinol).<sup>[19,20]</sup> The terpenester composition determines that it is irritating to the skin. In contact with mucous membranes (eyes, nose, mouth), the latex can produce extremely painful inflammation.<sup>[21]</sup>

Chemical eye injury is an ophthalmic emergency, which may be caused by exposure to an acidic (pH<4) or an alkali (pH>10) solution to the eye.<sup>[22]</sup> It is the only eye injury that requires emergency treatment without formal clinical assessment. Symptoms usually start immediately on contact with the milky latex. There is burning sensation, pain, photophobia and lacrimation which may worsen over

hours even after copious irrigation. The degree of ocular inflammation may also vary with the amount of sap that enters the eye. Neglected cases can progress to blindness due to corneal scarring, complicated uveitis, and anterior staphyloma.<sup>[18]</sup> There are other reports in the literature of corneal injury following contact with plant species known to produce irritant saps. In cases of suspected corneal contact with the sap of *Euphorbia* species, there are published recommendations for treatment. People who work with the milky latex of *Euphorbia* plant species must use goggles, gloves and mask as preventive aspect. In first aid, Patients with a history of plant sap entering directly or indirectly into their eyes should be immediately irrigated with copious tap water Ringer's solution or normal saline and requirement to maintain pH.<sup>[23]</sup> It is suggested to continue rinsing the eye for no less than 10 minutes.<sup>[24]</sup> Topical anesthesia of the eye is an important adjunct to the workup of emergency department patients with ocular complaints. Not only is topical eye anesthesia important in relieving discomfort and allowing a thorough examination, it also is important diagnostically to help differentiate pain from superficial problems such as corneal abrasions and foreign bodies from pain arising from deeper structures as in acute iritis.<sup>[25]</sup> Treatment should include the use of topical antibiotics, steroids and pain killer drugs. It is important to closely follow up in the first few days to control inflammation and to prevent infection and complications. Topical corticosteroids play a critical role in controlling acute inflammation after chemical injuries. They reduce inflammatory cell infiltration and stabilize neutrophilic cytoplasmic and lysosomal membranes. They also help resolving anterior chamber as well as conjunctival inflammation.<sup>[26]</sup>

On other hand, Ayurveda point of view *Snuhi Ksheera* toxicity can be managed by application of *Chinchapatra* (*Tamarindus indica* Linn.) paste to affecting body part and drinking of *Swarna Gairika* (red ochre) processed water.<sup>[27]</sup> *Ghritha manda* which always remains in a liquid state is rich in unsaturated fatty acids, esp. omega-3 and omega-4, which are essential for vision and have a good effect on dry eye syndrome due to their anti-inflammatory effects.<sup>[28]</sup> Follow-up should be frequent in the first few days to identify such as bacterial supra-infection and uveitis. Most of the condition is self-limiting and has a full recovery without sequelae after supportive treatment over a week. Ophthalmologists should ask the patients to bring in a sample of the plant for identification and understanding the clinical course that may happen. The clinical course may be affected by particular species of *Euphorbia*, the amount of sap exposure, the time between exposure and irrigation, and host factors. Further studies are needed on this poisoning to know the chemical composition of latex and precise mechanism of action.

## CONCLUSION

In conclusion, being aware of these toxic plants and their sap constituents, the physician can manage patients exposed to the plants sap successfully in rural hospital with supportive therapy. This case therefore suggests that there is a risk of considerable ocular injury following contact with the latex of *E. caducifolia*. People must use goggles, gloves and mask as preventive aspect when handling such plants to minimize the risk of accidental injury.

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**Conflict of Interest-** None declared

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## Consent

The patient consent was received for this case report to be published.

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