

First case report of toxicity with *Lactuca virosa* in a lamb

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ABSTRACT

Background and aims: Consumption of *Lactuca virosa* can induce toxic outcomes. Wild lettuce occurs in many countries including Iran, and some native peoples eat leaves and stems of this plant while they are unaware of its adverse side effects. Livestock feeding with this plant causes toxicity. In this report, clinical signs and clinicopathological findings of this rare case of poisoning due to wild lettuce toxicity in a lamb were described.

Case presentation: In the autumn of 2019, a lamb was referred to the veterinary teaching hospital of the School of Veterinary Medicine, Urmia University, Iran. According to the owner's description, this female lamb consumed large amounts of *Lactuca virosa*. In clinical examination, nervous system alteration with depression, weakness, ataxia, dullness, somnolence, drooping of the ears, and eyelids were seen. The animal had anorexia and tachycardia. The main clinical findings in the eyes were nystagmus, mydriasis, and the absence of menace reflex with the presence of direct pupillary light reflex that indicated central blindness. To the best of our knowledge, this is the first report of *Lactuca virosa*-induced poisoning in lamb.

Conclusion: *Lactuca virosa* could induce toxicity in lamb that leads to mainly CNS dysfunctions. According to this experience, access restriction to toxic plant and conservative treatment including the laxative and vitamin B1 administration could be useful as the basis of treatment.

Keywords: Poisoning, *Lactuca virosa*, Lamb

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INTRODUCTION

Medicinal plants are used by the people as natural remedies. Among them, wild lettuce has been used since ancient times to treat a variety of symptoms, including pain. Although wild lettuce may have several health benefits, many people are unaware of the adverse side effects that can occur due to using this plant. Although the benefits of wild lettuce remain unstudied, its side effects have been investigated. The wide variety of plants in different regions of Iran and the lack of sufficient knowledge about their chemical compounds cause unwanted poisonings and complications, which leads to serious problems for livestock units and rangeland dependence. Increasing the knowledge about these range plants can restrict the harmful effects caused by their misapplication¹. Wild lettuce (Fig. 1), which is known as *Laitue vireuse* in French, *wilder lattich* in German, and *Kahoye Vahshi* in Persian, is additionally identified as opium lettuce. The scientific name of this plant is *Lactuca virosa*; in Latin, *lactuca* means milky white extract and *virosa* means poisonous². *Lactuca virosa* is a biennial plant that grows on

the margin of rivers and waste grounds to a maximum height of 6 feet until flowering in July and August¹. Wild lettuce has club-shaped, light green above, paler green beneath leaves; also a few short hairs on the surface of them were seen. The young herb has sometimes a purple-spotted, erect stem which arises from a brown root². It is originally from Eurasia and grown in different regions of the world, such as Austria, France, Germany, Scotland, and Iran. The whole plant is rich in a white milky juice that flows freely when it is scrapped. The juice has an astringent taste and an offensive odor. When the juice is dried, it becomes hard and turns brown, and is known as *lactucarium*. *L. virosa* contains 50–60% lactucerin (lactucone) as the main component although other ingredients such as actucic acid, lactucopocrin, and lactucin have also been found^{3,4}. *Lactuca virosa* toxicity includes complications such as anxiety, dizziness, mydriasis, urinary retention, decreased intestinal peristaltic motilities, over-discharge, tachycardia, tachypnea, and cardiac arrhythmia, decreased level of consciousness, coma and seizures. To the best of our

Poisoning *Lactuca virosa*

knowledge, this is the first report of *L. virosa* toxicity in a lamb in Iran.

Case Description

In autumn 2019, a female lamb about 6 months old from the Ghezel breed with a history of consuming too much level of wild *Lactuca virosa* was referred to the veterinary teaching hospital of the School of Veterinary Medicine, Urmia University, Iran. Physical examination revealed nervous system alterations including depression, weakness, ataxia, dullness, somnolence, drooping of the ears, and eyelids (Fig 2). The animal had anorexia and tachycardia. The main clinical findings in the eyes were nystagmus, mydriasis, and the absence of menace reflex with the presence of direct pupillary light reflex indicated central blindness. A blood sample was taken from the jugular vein and analyzed. Hemogram alterations with more details were shown in Table 1.



Fig.1. *Lactuca virosa*



Fig.2. Female lamb presented with depression, weakness, dullness, drooping of the ears, and eyelids.

Table 1. Blood parameters of the affected lamb

Parameter	Normal range	Affected Lamb
Hematology		
PCV (%)	24-49	29.1
HB(g/dl)	8.0-16	9.6
<i>RBC</i>	8.0-15	11.2
MCV (fL)	23-48	26.1
<i>MCH</i> (pg)	8.0-12	8.6
<i>MCHC</i> (g/dl)	31-34	33
Total WBC (/μL)	4000-12000	18700
Neutrophil	1000-5000	11781
Eosinophil	100-750	561
Lymphocyte	2000-9000	5984
Monocyte	0-750	374
Total protein (g/dl)	6.0-7.9	9.1
Fibrinogen (mg/dl)	100-500	600

Treatment

The lamb was kept fasted and treated with crystalloid intravenous fluids to maintain adequate hydration status. In this case, nasogastric intubation and gastro-oesophageal lavage were performed. The obtained liquid and the fine particles of wild lettuce were confirmed by laboratory tests. Treatment

continued with laxative, about 300 ml/h for 12 h and Thiamine (B-ject[®]) 3ml/6 h for 5 days. Follow-up observations revealed that the lamb fully recovered, and all the abnormal clinical signs disappeared five days later. No long-lasting complications were seen and reported by the owner.

Results and Discussion

Fresh parts of *L. virosa* are attractive for the livestock animals and are consumed by ruminants and horses. The plant contains milky juice, a substance generally called lettuce-opium, which is used in medicine as a mild tranquilizer. Therefore, there is a common belief among people that eating large quantities of this plant leads to sleepiness. Until now, there has been no document that wild lettuce contains sufficient lettuce-opium to induce poisoning in livestock although it is distributed everywhere across the country. Anecdotally, *L. virosa* may be poisonous without giving any further data or specific instances. Moreover, many others have reported that sheep eat large quantities of this plant without any obvious adverse effects; therefore, the clinical signs and biochemical alterations have not yet been reported in domestic animals that consume large amount of this plant in the pasture. We discussed this case report according to available data about human cases. *L. virosa* induces hypoglycaemic effects⁵.⁶ In the human population, it is consumed as a natural remedy. Some have reported that the plant has no

therapeutic outcomes; some others believe that it has sedative and hypnotic effects, and some have enlisted it as a poison^{5, 7}. Toxicity signs in humans include anxiety, dizziness and mydriasis, urinary retention, decreased intestinal peristaltic motilities, and sympathetic over-discharge, suggesting the interaction of anticholinergic mechanisms in toxicity pathogenesis^{5, 8}.

In addition, there have been reports on the herb used as an alternative to opium. Experimentally intravenous injection of an extract of wild lettuce and valerian root in three young intravenous drug users caused fever, coolness, abdominal and back pain, neck stiffness, headache, leucocytosis, and mild disorders in liver function⁴. All of the three people recovered within 3 days. In this case, lamb suffered from the harmful effects of *Lactuca virosa* exhibited similar clinical signs. Conservative treatment led to full recovery of the animal. It was concluded that *Lactuca virosa* could induce plant toxicity if it was consumed in high amounts by the animals. The signs like those reported in human medicine may be detected in affected

animals; however, further research is required to investigate this argument.

CONFLICT OF INTEREST

There is no conflict of interests to disclose.

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References

1. Zargari A. Medicinal plants. Tehran University Publications 1978; 3: 223–8.
2. Heber D. PDR for herbal medicine, 3rd ed Thomson Company, 2004: 495–6.
3. Trojanowska A. Lettuce, lactuca sp., as a medicinal plant in polish publications of the 19th century. *Kwart Hist Nauki Tech* 2005; 50: 123–34.
4. Mullins ME, Horowitz BZ. The case of the salad shooters: intravenous injection of wild lettuce extract. *Vet Hum Toxicol* 1998; 40: 290–1.
5. Besharat S, Besharat M, Jabbari A. Wild lettuce (*Lactuca virosa*) toxicity. *BMJ Case Rep.* 2009 Apr 28. doi: 10.1136/bcr.06.2008.0134.
- 6- Wesółowska A, Nikiforuk A, Michalska K, Kisiel, W. and Chojnacka-Wójcik E. 2006. Analgesic and sedative activities of lactucin and some lactucin-like guaianolides in mice. *Journal of Ethnopharmacology*, 107(2), 254-258.
- 7- Gromek D, Kisiel W, Klodzińska, A. and Chojnacka-Wójcik, E., 1992. Biologically active preparations from *Lactuca virosa* L. *Phytotherapy Research*, 6(5), 285-287.
- 8- Cavin C, Delannoy M, Malnoe A, Debeve E, Touche, A., Courtois, D. and Schilter, B., 2005. Inhibition of the expression and activity of cyclooxygenase-2 by chicory extract. *Biochemical and Biophysical Research Communications*, 327(3), 742-749.
- 9- Paulsen, E. and Andersen, K.E., 2016. Lettuce contact allergy. *Contact dermatitis*, 74(2), 67-75.
- 10- Zhang F, Yan Y, Wang Y. and Liu, Z., 2016. Lactucin induces potent anti-cancer effects in HL-60 human leukemia cancer cells by inducing apoptosis and sub-G1 cell cycle arrest. *Bangladesh Journal of Pharmacology*, 11(2), 478-484.
- 11- Subedi L, Venkatesan R, Park Y.U. and Kim, S. 2016. Lactucopicrin suppresses oxidative stress initiated by scopolamine-induced neurotoxicity through activation of NRF2 pathway. *The FASEB Journal*, 30(1 Supplement), lb511-lb511.