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Poisoning of sheep by Babrik Plant (*Cionura erecta* (L.) Griseb.) in Şanlıurfa / Turkey

Kasım TAKIM[1,a], Hasan AKAN[2,b,*], Hikmet DİNÇ[3,c], Abdullah GÖKMEN[4,d]

[1]Harran University Faculty of Veterinary Medicine, Department of Biochemistry, Şanlıurfa, Turkey.
[2]Harran University, Faculty of Arts and Sciences, Department of Biology, Şanlıurfa, Turkey.
[3]Gaziantep Islam Science and Technology University, Medical Faculty, Gaziantep, Turkey.
[4]Şanlıurfa Haliliye District Directorate of Agriculture Animal Health Unit, Şanlıurfa, Turkey.
[a]ORCID: 0000-0003-4631-1982, [b]ORCID: 0000-0002-3033-4349, [c]ORCID: 0000-0003-1823-1790, [d]ORCID: 0000-0003-2120-4128

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Abstract: *Cionura erecta* (L.) Griseb., belongs to the Apocynaceae family, is one of the poison plants in Turkey, widely grown in the Mediterranean region, and known as Babrik in Turkey. In south east Anatolia, the vernacular name of the plant is Halava and Kulf. In the Mello village of Haliliye, district of Şanlıurfa, plant poisoning in sheep has been reported. This plant poisoned 120 sheep in the herd of 300 sheep in Mello village of Haliliye district of Şanlıurfa. In 50 seriously ill sheep,coordination disorder-weakness-difficulty in breathing, and coma were observed. A self-employed veterinarian responded to toxication first by giving electrolyte supplementation and medicated (antihistamine) serum; 37 of these animals died.Then, veterinarians affiliated with the provincial and district agriculture directorate intervened and the remains were saved. Necropsy was also performed on deceased animals. Babrik was observed in the gastrointestinal contents with intense deformation in the rumen and intestinal mucosa. Phytochemical studies were also compiled to predict plant toxicity in this case report.
Keywords: *Babrik, Cionura erecta, Poisoning, Sheep.*

Şanlıurfa (Türkiye)'da Koyunlarda Babrik Bitkisi zehirlenmesi (*Cionura erecta* (L.) Griseb)

Özet: Apocynaceae familyasına ait *Cionura erecta* (L.) Griseb., Türkiye'de Akdeniz bölgesinde yaygın olarak yetiştirilen ve Babrik olarak bilinen zehirli bitkilerden biridir. Güneydoğu Anadolu'da bitkinin yerel adı Halava ve Kulf'tur. Şanlıurfa'nın Haliliye ilçesine bağlı Mello köyünde 300 koyunun olduğu sürüde bu bitkiden 120 koyunun zehirlendiği bildirildi. Ağır hasta olan 50 hayvanda; koordinasyon bozukluğu-halsizlik-nefes almada güçlük ve koma hali görülmüştür. İlk müdahale serbest veteriner hekim tarafından, elektrolit takviyesi ve toksikasyon sağaltımı için ilaçlı (antihistaminik) serum vermek suretiyle yapılmış, akut toksikasyon belirtileri gösteren bu hayvanlardan 37'si telef olmuştur. Daha sonra il ve ilçe tarım müdürlüğüne bağlı veteriner hekimler müdahale edip geriye kalan hayvanlar kurtarılmıştır. Ölen hayvanlarda nekropsi yapılmış, rumen ve bağırsak mukozalarında yoğun deformasyonla birlikte mide bağırsak içeriğinde bu bitkiden büyük miktarda bulunduğunu görülmüştür. Bu vaka raporunda bitkinin toksikasyonunu tahmin etmek amacıyla fitokimyasal çalışmalar da derlenmiştir.
Anahtar sözcükler: *Babrik, Cionura erecta, Koyun, Zehirlenme.*

Introduction

The plant, *Cionura erecta* (L.) Griseb., which contains much poisonous milk juice, is widely grown in Turkey (Browicz, 1967; Browicz, 1978). The plant naturally spreads in the region from the eastern Mediterranean basin to Afghanistan. It is a widespread species in Turkey except for Central and North Eastern Anatolia (Yaltirik, 1967).It grows on conglomerate scree, limestone cliff's, fields, river beds, beaches and waste places from sea level to 100 (-l400) m (Browicz, 1978). The flowering time is between April and September.

Cionura erecta is taxonomically in the Apocynaceae family. The genus *Cionura* is represented by a single species in the world. The Turkish names of plant are Babrik, Panzehir otu, Bodur otu and Dağ sarmaşığı (Polat and Selvi, 2020). Its local names in Şanlıurfa are Halava (Arabic) and Kulf (Kurdish) (Figure 1). It has a vast population in Şanlıurfa.

The poisonous properties of *Cionura erecta* (L.) Griseb. has been known since antiquity. It has been used to exterminate harmful animals and the name "Apocynon" was given to this plant by Dioscorides to refer to that particular function (Baumann, 1996; Myrianthopoulos et al., 2007; Öztürk et al., 2008)

The whole part of the plant is toxic.The phytochemical studies on the plant determined the harmful effect vary according to the features of the plant. It is known that anethole (80.6%), defined in the essential oil of plant leaves, is a poisonous and irritating compound in large quantities (Mirza and Navaei, 2009). Also, in another study mentioned,

safranal (16.8%) was determined as the main component in the plant's essential oil. As a result of the literature review, it has been stated that the compound showing the toxic effect is safranal (Myrianthopoulos et al, 2007; Öztürk et al., 2008). Thus, it is thought that the *Cionura erecta* causes the animal poisoning cases seen in various regions of Turkey.Since it is a poisonous plant, goats and sheep do not approach it (Öztürk et al., 2008).

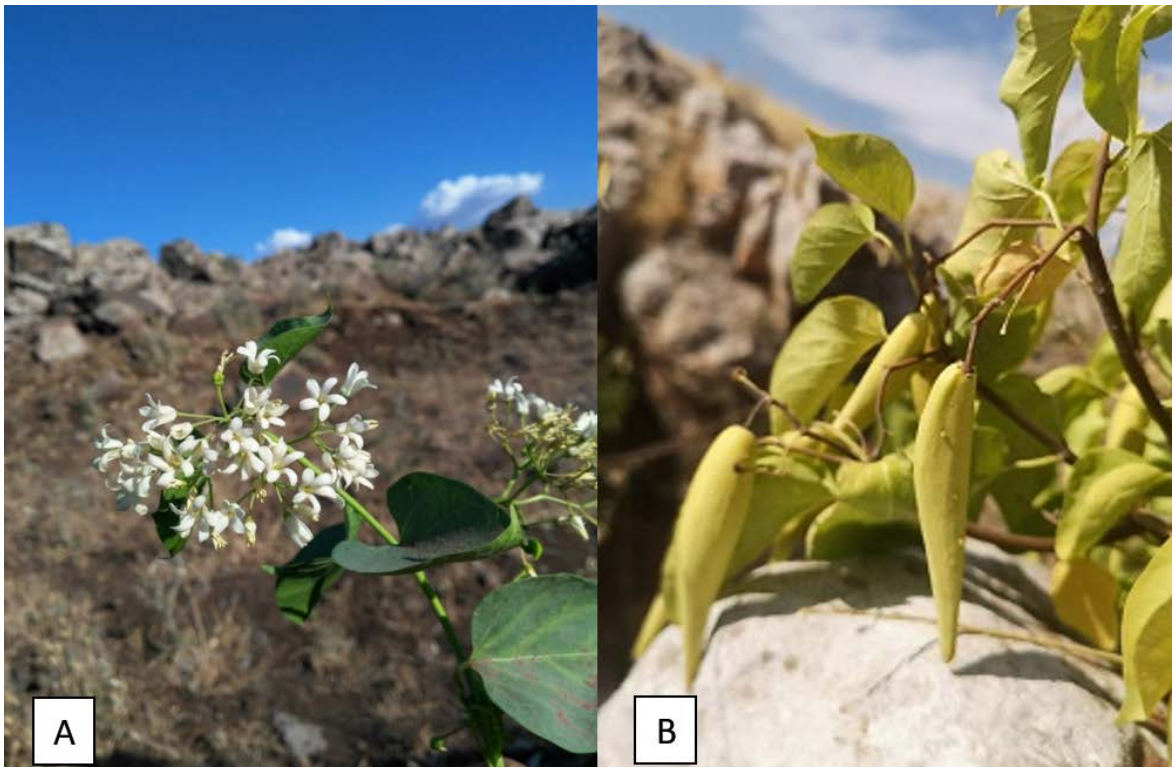

Figure 1. General view of Cionura erecta in field. A) Flowers, B) Fruits

Figure 2. A) Sheep poisoned by *Cionura erecta* and B) Their treatment procedures by veterinarians.

Case History

The poisoning case took place in the evening time in the stream bed called Zilasun. We made investigations in the Zilasun creek bed where the case took place. When we arrived at the area after a phone call, we saw dead sheep (Figure 2) with signs of enterotoxemia in the herd of about 300 heads (İvesi Sarıbaş breed). Intoxication symptoms appeared around 21.00 in the evening. Coordination disorder-weakness-difficulty in breathing and coma were observed in sick animals. The treatment administered by the self-employed veterinarian during this period did not yield any results, and these animals, which showed signs of acute toxicity, died. In this case, the number of animals thatperished is 37 heads (two male, 35 female). It was observed that there was a large amount of poisonous plant, *Cionura erecta* , in the gastrointestinal contents of

the necropsy animals, with intense deformation in the rumen and intestinal mucosa.

The scene investigation determined that the vegetation was dry as usual for the season, but the plant causing the poisoning was still wet, and fruit parts were consumed mostly. Sheep do not usually eat this plant. We think the animals eat this plant because they are starving. The animal owner did not want to give information. Still, we guess hungry animals are more sensitive to poisonous plants if they consume large amounts.So the animals should be given grass and hay before they are released to the pasture. When signs of poisoning began, the herd should be immediately removed from the area and not allowed to drink water. However, we think that there is no herd follow-up and that the animal owner does not have enough information about not drinking water.

No abortion cases were observed in the herd.

We could not report further details due to the many affected animals.

Anamnesis information, signs of poisoning, and the destruction of the plant toxin in the stomach, and the necropsy results proved the acute intoxication caused by this plant.

On the morning of the incident, after the animal owner reported that similar symptoms had started in the rest of the herd, Haliliye District authorized veterinarians examined the pack. A treatment plan was prepared and implemented in consultation with self-employed veterinarian experts. They gave liquid oil to all animals. Antihistaminic-5% dextrose-calcium-B complex vitamin-sodium bicarbonate is applied. Animals without enterotoxemia symptoms (swelling) are supported with atropine. Additionally, non-pregnant animals were administered cortisone. After this treatment, no death was reported.

Locality of investigated plant: C7 Şanlıurfa: Haliliye, Mello Village, 37º14'15.8''N 38º52'31.8''E, 600-700 m, 13.10.2020, H.Akan *6094&K.Takım*. It was deposited in HARRAN herbarium in Harran University.

Discussion and Conclusion

The poisonous properties of *Cionura erecta* have been known since ancient times. It has been traditionally used to kill pest animals (Öztürk et al., 2008).

C. erecta plant was extracted with the Clevenger device by collecting the leaves, stems, and fruits. Gas chromatography (GC) added to mass spectrometry (GC-MS) was used to define the essential oil composition. In this study, a total of 23 major chemical compounds were identified. Among these compounds, cedron-9-one and eugenol were found at the highest levels (Moradian et al., 2018).

Recently, when the phytochemical studies on the plant are examined, the components thought to be responsible for the toxic effect vary according to the parts of the plant. It is known that anethole (80.6%) detected in the essential oil of plant leaves is a poisonous and irritating compound in large amounts (Mirza and Navaei, 2009).

In addition, in another study mentioned, safranal (16.8%) was determined as the main component in the plant's essential oil. As a result of the literature review, it was found that safranal has cytotoxic effects. The main components of the leaves were found to be 80.6% (E)-anethole and 10.3% neophytadiene. The main features obtained from flowers were methyl hexadecanoate (22%), tetradecanol (13.3%), 2-methoxy-benzaldehyde (9.0%), and decanol (8.6%) (3). In a similar study, 72 components representing 91.3% of the total were identified in the essential oil of the plant (Mirza and Navaei, 2009; Myrianthopoulos et al., 2007).

The root essential oil and methanol extract of *C. erecta* were investigated for their larvicidal and repellent activities against *Anopheles stephensi* under laboratory conditions. 320 ppm essential oil and 1280 ppm methanolic extract was found to have 100% mortality. In this study, 19 compounds were identified in essential oil. The main components were found to be cedren-9-one (7.89%), alpha cachinol (5.67%), eugenol (4.02%), and alpha muurolene (3.58%) (Mozaffari et al., 2014).

According to the information received from the field, it is stated that such cases have occurred before, but only a few animals have been affected, and the health status of the animals can be restored by treating the affected animals with sugar water. In addition, according to the public experience, it has been reported that both the leaf and fruit parts of this plant adversely affect the animals, but the fruit part has a faster and more toxic effect.

The animals we got results responded to the treatment because they consumed the plant less and did not show signs of acute enterotoxemia. Therefore, existing observation and traditional experience support each other.

Hungry animals are more susceptible to poisonous plants and consume large amounts, so animals should be given grass and hay before being released into the pasture. When signs of poisoning begin, the herd should be immediately removed from the area and not be allowed to drink waterbecause water will accelerate the absorption of toxins. More detailed analyzes are needed to determine whether this case originated from the *C. erecta*.

It has not been reported how many days the animals recover after treatment. The blood samples

taken at the beginning were not kept as it was not considered to be a forensic case.

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

Ethical Approval

This study is not subject to HADYEK's permission in accordance with Article 8 (k) of the "Regulation on Working Procedures and Principles of Animal Experiments Ethics Committees".

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*__Correspondencer:__ Hasan AKAN
Harran University, Faculty of Arts and Sciences, Department of Biology, Şanlıurfa, Turkey.
e-mail: hakan@harran.edu.tr