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Case Report

Spontaneous outbreak of *Pascalia glauca* poisoning in sheep in Argentina

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Abstract

Pascalia glauca is a native weed and one of the most common hepatotoxic plant affecting cattle in Argentina. Although experimental *P. glauca* poisoning have been reported in sheep, no spontaneous cases have been reported in this species. This work describes an outbreak of intoxication after spontaneous consumption of *P. glauca*, affecting 20% (6/30) sheep of a commercial flock. Affected sheep were ataxic, depressive, with mucous nasal discharge, cough and abdominal breathing. During post mortem examination, liver was swollen and a diffuse enhancement of the reticular pattern ("nutmeg liver") was visible. Histopathological examination reveals severe and extensive acute diffuse centrilobular hepatic necrosis with hemorrhage. The presence of the toxic plant, the clinical and pathological findings allows us to confirm the etiology of this outbreak.

Key words: *Pascalia glauca*, ovine, intoxication.

Intro

Pascalia glauca (*Heliantheae*, *Asteraceae*) (syn. *Wedelia glauca*), commonly known as "sunchillo" or "yuyo sapo", is a native perennial South American weed usually invasive of crops, parks and paddocks (4, 5, 8). *P. glauca* contains a toxic compound belonging to the group of diterpenoid glycosides with a similar structure to atractyloside and carboxyatractyloside (7, 9) which inhibits the oxidative phosphorylation of the mitochondria producing centrilobular hepatic necrosis (9).

Experimental and spontaneous *P. glauca* poisoning have been reported in different animal species: cattle (4), sheep (2), goats (1), deer (*Axis axis*) and llamas (*Lama glama*) (5). However, no spontaneous poisoning cases have been reported in sheep.

Case description

This short communication describes an outbreak of spontaneous intoxication with *P. glauca* occurred in February 2014 in a commercial flock at a farm located in Balcarce (37°45'15"S 58°19'00"W), Buenos Aires province, Argentina.

Twenty percent of the 30 sheep flock was affected. Two days before the first two dead sheep and a ram were observed, the flock was moved to a pasture paddock, where later, a large amount of *P. glauca* with evidence of having been consumed, was detected. Vegetal specimens collected in the paddock were later botanically confirmed as *P. glauca*. No other toxic plants were detected in the paddock. Other four sheep were later clinically inspected showing hindquarters ataxia, depression, mucous nasal discharge,

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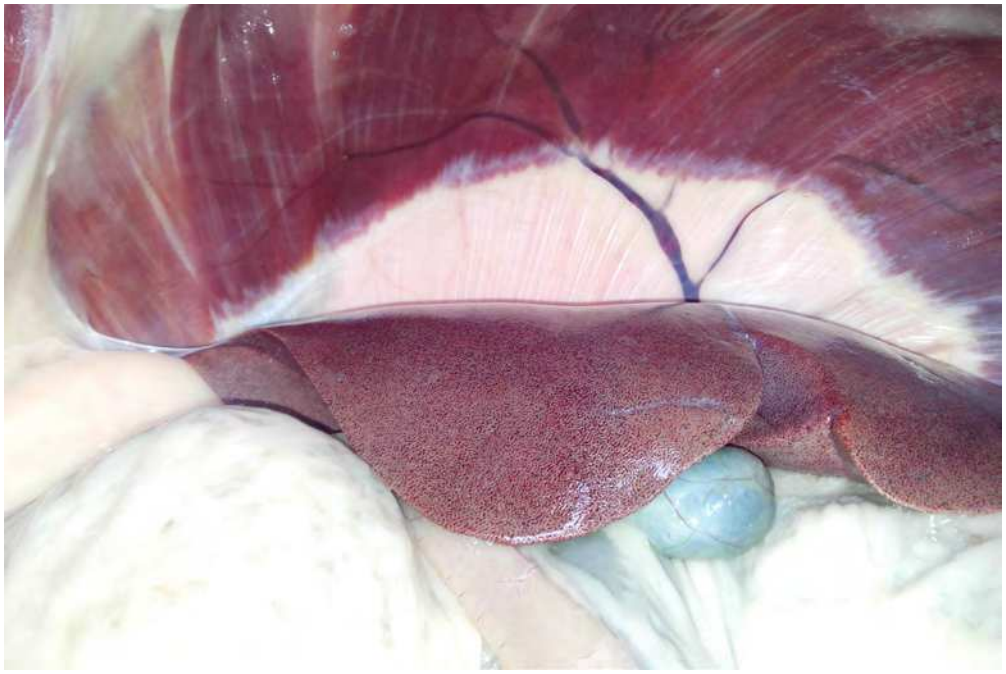


Figure 1. Liver. Diffuse reticular pattern associated with centrilobular necrosis with hemorrhage in the cut surface of the liver.

cough and abdominal breathing. Jugular blood samples were collected from these four affected sheep for the determination of hepatic transaminase enzymes activity by spectrophotometry with commercial kits (γ-G-test *cinética AA* y Transaminasas 200; Wiener Lab, Rosario, Argentina). AST and γ-GT activity was elevated in some affected sheep: up to 410 U/L and 399 U/L, respectively [reference values: up to 280 and 52 U/L, respectively (6)].

One severely affected sheep was euthanized according to the guidelines of the Committee for Care and Use of Experimental Animals from INTA, and necropsy was carried out. Liver was swollen and a diffuse enhancement of the reticular pattern ("nutmeg liver") was visible both from the capsular and cut surfaces of the parenchyma (Fig. 1). Gallbladder was plethoric with diffuse edematous walls. In the nasal cavity and lower airways (bronchi and bronchioles), *Oestrus ovis* and *Dyctiocaulus* spp. were observed respectively.

Tissue samples were fixed by immersion in 10% neutral buffered formalin and processed by standard techniques to produce 5-µm-thick paraffin sections, stained with hematoxylin and eosin (HE). Microscopically, at lower magnification, diffuse centrilobular hepatic necrosis with hemorrhage was observed (Fig. 2). At higher magnification, pyknotic or karyolytic nuclei hepatocytes and a moderate infiltrate composed of neutrophils were evidenced within the areas of necrosis (Fig. 3).

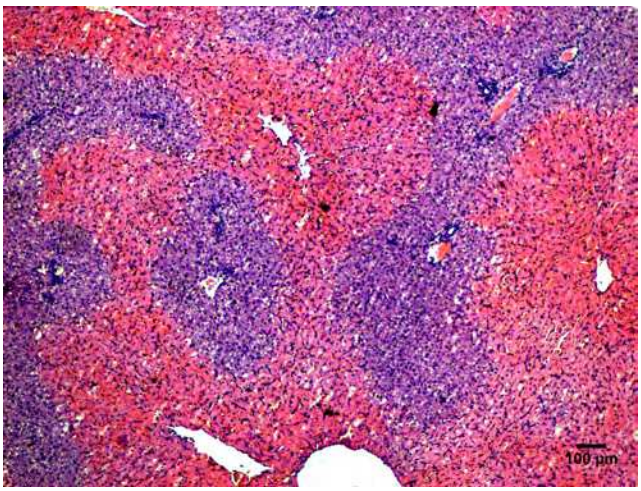


Figure 2. Histopathology of the liver. Centrilobular to massive hepatic necrosis with hemorrhage. Hematoxylin and eosin. Bar = 100µm.

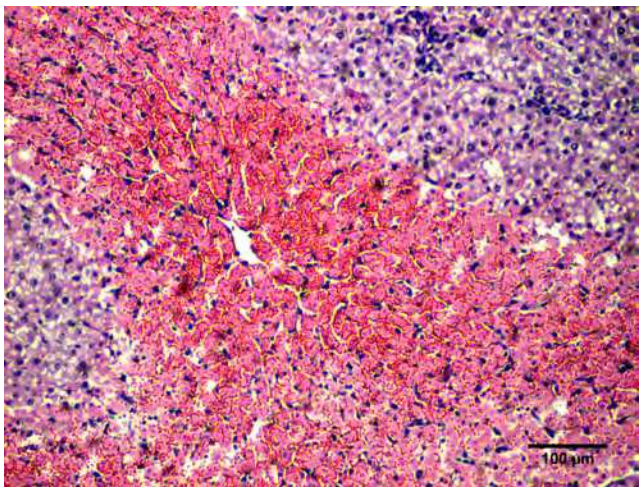


Figure 3. Histopathology of the liver. Hepatocytes with pyknotic or karyolytic nuclei and a moderate infiltrate composed of neutrophils. Hematoxylin and eosin. Bar = 100µm.

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Discussion

Epidemiological data, clinical and pathological findings, laboratory results and the presence of abundant *P. glauca* with evidence of being consumed in the paddock, was sufficient to confirm this diagnosis. Pathological findings were similar to the described in previous experimental *P. glauca* poisoning in sheep (2) and other animal species (1, 4, 5).

Variable transaminase activity was detected in the sampled animals: some sheep had normal transaminase activity while other showed elevated activity (data not showed). This could indicate that not all exposed animals ingested a lethal dose or this could be related with the different half-life of these enzymes (between 24 and 80 hours) (6).

In previous experimental poisoning in sheep, a single dose of 1.5 g of dry matter of *P. glauca* per kg of body weight (equivalent approximately to 4.5 g of fresh plant), ingested in a short period of time was able to induce intoxication (2, 10). In this natural outbreak, it was not possible to determine the dose ingested by the affected sheep.

This work describes for the first time an outbreak of natural poisoning with *P. glauca* in sheep associated with introduction to a pasture paddock. *P. glauca* is one of the most common toxic plants affecting cattle in Argentina (3), nevertheless, no previous reports of the intoxication has been described in sheep. No other hepatotoxic plants (*Cestrum parqui*, *Xanthium* spp.) or agents commonly diagnosed in the region were present in the paddock. It is desirable that paddocks are inspected prior to the introduction of grazing animals in order to detect the presence of toxic plants and avoid these unfortunate events.

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