



A postmortem case of the pink teeth phenomenon in an ocelot *Leopardus pardalis*

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Abstract

We report a case of the postmortem pink teeth phenomenon, observed in an ocelot *Leopardus pardalis* killed by vehicular trauma in northeastern Argentina. The specimen showed pink-purple discoloration in all teeth, which was most pronounced at the root and below the cervical area. Although this discoloration is usually associated with cadavers remaining submerged in water or exposed to high humidity for extended periods, in this case the pink coloration developed within 48 hours postmortem, and under low ambient humidity. This phenomenon, likely underreported, warrants further investigation to better understand how environmental conditions, postmortem interval, and cause of death may influence its appearance. Establishing a potential association between the occurrence of pink teeth and specific causes of death in wild animals could provide a valuable tool for veterinary forensic investigations.

Key words: Roadkills, carnivores, felines, pink teeth, postmortem, forensic science.

Un caso *post mortem* del fenómeno de dientes rosados en un ocelote *Leopardus pardalis*

Resumen. Presentamos aquí un caso del fenómeno de dientes rosados *post mortem*, observado en un ocelote *Leopardus pardalis* muerto por atropellamiento en el nordeste de Argentina. El ejemplar presentó coloración rosado-púrpura en todos los dientes, más marcada en la raíz, debajo de zona cervical. Aunque se suele asociar la aparición de esta coloración a la permanencia del cuerpo por periodos prolongados debajo el agua o en condiciones de elevada humedad, en este se presentó menos de 48 h después de la muerte, y en condiciones de baja humedad ambiente. Este fenómeno, probablemente subobservado, necesita ser mejor comprendido, lo que amerita realizar estudios adicionales en mamíferos, sobre cómo las condiciones ambientales, el tiempo y la causa de muerte afectan o no la apariencia de esta coloración. De establecerse una relación entre su aparición y la causa de muerte en animales silvestres, podría constituir una herramienta de importancia forense veterinaria.

Palabras claves: Atropellamientos de fauna, carnívoros, felinos, *post mortem*, dientes rosados, ciencia forense.

INTRODUCTION

The term “pink teeth phenomenon” refers to a characteristic discoloration of the crowns and roots of teeth, first described in humans nearly 200 years ago (Bell 1829). The color change affects only the dentin and is caused by increased intracranial blood pressure, leading to hemorrhage in the pulp chamber, followed by erythrocyte extravasation, autolysis, and the diffusion of hemoglobin

and its degradation products from the pulp tissue into the dentin through the dentinal tubules, while the enamel remains unaffected (Lunetta and Model 2005, Tsokos 2005, Manoilescu et al. 2015). This discoloration occurs mainly in single-rooted teeth (incisors and canines) rather than in multi-rooted teeth (molars and premolars) (Franco et al. 2018). Despite the commonly used name for this phenomenon, the teeth can show a range of shades from pale pink to dark purple (Minegishi et al. 2022). The color

is particularly evident near the cemento-enamel junction on the tooth root, fading somewhat beneath the enamel, but still clearly visible (Manoilescu et al. 2015).

This phenomenon is well known in forensic science and has been observed with drowning, carbon monoxide poisoning, barbiturate intoxication, hanging or strangulation, and even sudden deaths, such as those caused by gunshot wounds. However, nearly two centuries after its discovery, its exact etiology remains unknown, and it is not considered pathognomonic of any specific cause of death (e.g., Borrmann et al. 1994, Hartomo et al. 2019, Minegishi et al. 2022, Braga et al. 2024). Moreover, it has been shown that in some situations, certain factors can lead to the appearance of dental discoloration after death, including high humidity, submersion of the body in water, young age, and exposure of the teeth to heat or cold (Manoilescu et al. 2015).

Despite its use in forensic investigations, there is very little information on the presence of postmortem pink teeth in non-human mammals. Roux et al. (2009), in a study on the dentition of wild felids in Namibia, reported its occurrence in specimens of cheetahs *Acinonyx jubatus* and leopards *Panthera pardus*; Collados et al. (2018) in a skull of an Iberian lynx *Lynx pardinus*. Finally, Stern et al. (2022) reported its presence in nine dogs and one domestic cat. The latter authors highlighted the extremely

limited number of studies in animals and suggested that the occurrence of pink teeth is underreported in veterinary pathology. The aim of this study was to describe a case of postmortem pink teeth in an ocelot killed by vehicular trauma in northeastern Argentina.

MATERIALS AND METHODS

On July 22, 2024, an ocelot *Leopardus pardalis* killed by a vehicle collision was found along Provincial Route 120 (27°52'19.4"S, 56°07'53"W) (Figure 1), in the Santo Tomé Department, Corrientes Province, Argentina.

External measurements of the specimen (total length, head and body length, tail length, ear, and hind foot) were taken using a measuring tape (accuracy of 1 mm). Since the body was bloated and showed signs of decomposition, it was not weighed.

The carcass was placed in a plastic container within a forested area, where natural decomposition processes were allowed to occur. After one month, the bones were collected and cleaned with water and soap, and then soaked in 30% hydrogen peroxide diluted with water. The skeleton will soon be deposited at the "Bernardino Rivadavia" Natural Sciences Museum (MACN), Buenos Aires, Argentina. Once cleaned, cranial measurements were taken using calipers (accuracy of 0.02 mm).

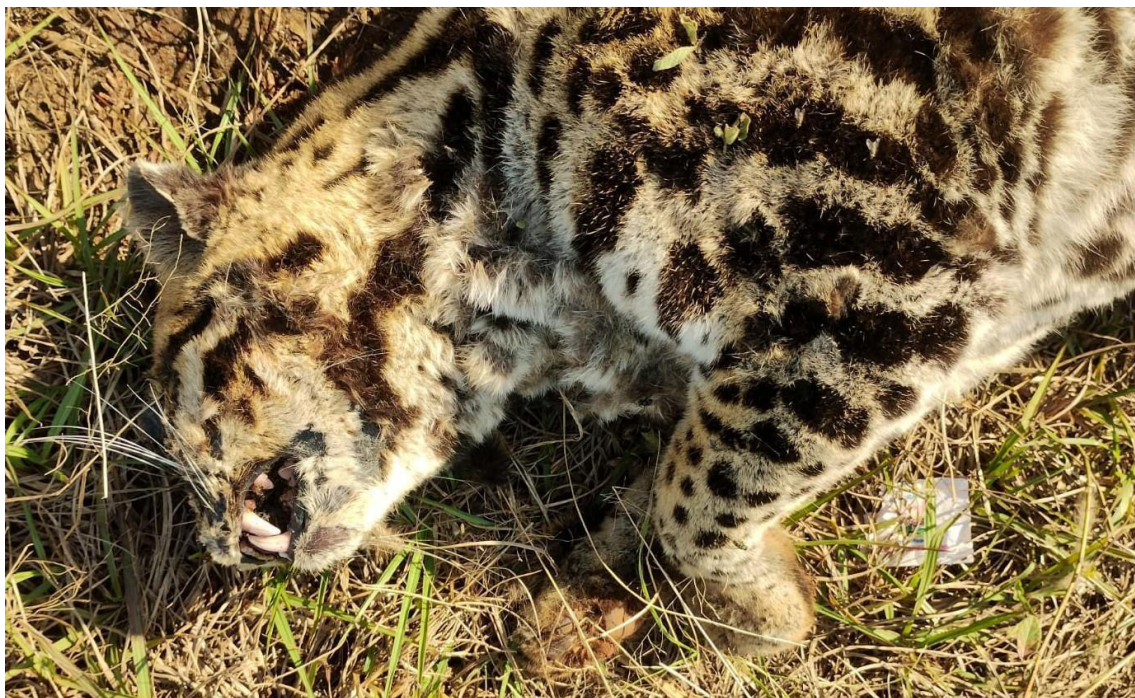


Figure 1. The ocelot *Leopardus pardalis* specimen found dead on Provincial Route 120, in northeast Corrientes, Argentina. The pink color of its teeth, especially the premolars, is visible.

RESULTS

The ocelot was a female, with the following body measurements: head-body length, 900 mm; tail, 330 mm; ear, 40 mm; hind foot length, 160 mm. Although these measurements correspond to an adult, the epiphyses and diaphyses were not fully fused, indicating a young adult. Fractures were observed in the spine of the left scapula, as well as in the radius of the forelimb on the same side,

but the skull showed no fractures from the vehicle impact. All teeth were in good condition, with no visible wear or cracks. Both the premaxillary and maxillary teeth, as well as the mandibular teeth, showed pink-purple discoloration, more noticeable in the molars and premolars (Figure 2). The discoloration was more intense at the root, just below the cervical area of the teeth. The animal's mouth was open, revealing the striking color of its teeth.



Figure 2. A) Right lateral view of the skull, and B) left lateral view of the mandible of the *Leopardus pardalis* specimen described in this study. Note the pink-purple discoloration of the teeth.

DISCUSSION

The case reported here presents several aspects that do not align with what is commonly stated in the literature on this phenomenon. One difference was the timing of the discoloration's appearance. In this ocelot, although it could not be precisely determined, it occurred within at least 48 hours after death. In contrast, most authors report a delay of one to three weeks between death and the appearance of the pink coloration in the teeth (Erlandsson and Munro 2007, Soriano et al. 2009, Machado Mendoza and Pérez 2022). Postmortem environmental conditions are often considered decisive factors for this discoloration, particularly immersion in water or burial or persistence in highly humid soils (e.g., Borrman et al. 1994, Roux 2009, Soriano et al. 2009, Braga et al. 2024). However, the ocelot's death occurred during an unusually hot and dry period in July 2024 (Southern Hemisphere winter). During those days, the maximum temperature reached 30°C, with low ambient humidity (49%) (Servicio Meteorológico Nacional 2024), and the last rainfall, which occurred 10 days earlier, did not exceed 5 mm (2024 rainfall statistics from Establecimiento Las Marías). Therefore, it seems unlikely that humidity was a determining factor in the appearance of this discoloration in this case. On the other hand, the available information on the role of temperature in the appearance of pink teeth is not clear: Hartomo et al. (2019) state that the onset of this phenomenon occurs rapidly at temperatures below 10 °C; Stern et al. (2022), on the other hand, point out that low temperatures could be responsible for the delay in the onset of this discoloration, and conversely, high temperatures would favor blood hemolysis and its diffusion in the dentin tubules. Although it cannot be stated definitively that the latter is the cause of the rapid appearance of pink teeth in the ocelot, it at least seems a plausible suggestion. It will be necessary to pay attention to this aspect in future records of similar cases.

Given the limited number of available studies, the value of consolidating existing data lies in providing a clearer understanding of this rare phenomenon. At present, there is still no consensus regarding the relationship

between the pink hue and cause of death (Borrman et al. 1994, Franco et al. 2018, Minegishi et al. 2022). This justifies conducting further studies on this phenomenon in non-human mammals, particularly on how different environmental conditions, time since death, and cause of death may or may not affect the appearance of the teeth (Stern et al. 2022). If a relationship could be established between the development of pink teeth and cause of death in wild animals, it could become a valuable tool in veterinary forensics (Braga et al. 2024). This is especially relevant in the current context of global biodiversity loss, worsened by poaching, with many mammal species facing potential extinction. Increasingly, criminal investigations into illegal hunting and wildlife trafficking rely on forensic evidence, which is crucial for prosecution and conviction (Viciano et al. 2022, Harper 2023). Therefore, when this phenomenon is detected in wild mammals by biologists and veterinarians, it should be described in as much detail as possible, with particular attention to the timing, cause, and circumstances of the animal's death, as well as environmental variables (temperature, humidity, water immersion). Lastly, but no less importantly, aspects of the ecology, physiology, and behavior of the species under investigation should be considered (Harper 2023). In this way, the value of this phenomenon in determining causes of death and its use as a forensic tool in animals could be established.

Acknowledgments. To Alejandro Azcarate, for informing us of the ocelot's location; to Adrián Gallardo and Mauro Distel for assisting with its transport. To Establecimiento Las Marías, for their support of our research activities.

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