

Collared peccary (*Pecari tajacu*) behavioral reactions toward a dead member of the herd

Dante de Kort¹ | Mariana Altrichter^{2,3} | Sara Cortez⁴ | Micaela Camino^{4,5,6} 

¹Sacred Heart Catholic School, Prescott, AZ, USA

²Prescott College, Prescott, AZ, USA

³IUCN/SSC Peccary Specialist Group, Gland, Switzerland

⁴Proyecto Quimilero, Resistencia, Argentina

⁵Consejo Nacional de Investigaciones Científicas y Técnicas, Buenos Aires, Argentina

⁶Centro de Ecología Aplicada del Litoral, Corrientes, Argentina

Correspondence

Mariana Altrichter, Prescott College, Prescott, AZ, USA.

Email: maltrichter@prescott.edu

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Abstract

Humans, elephants, chimpanzees, and cetaceans show concern with the death of other members of their species and respond to death in particular ways. Science considers that these species are exceptions and that other mammal species show little or no reaction to the dead bodies of individuals of their species. Collared peccaries (*Pecari tajacu*; Tayassuidae) are social animals that live in groups of 5–50 individuals maintaining close and complex social relationships. The collared peccary occupies many different environments and it is widely distributed from the south of North America to the north of Argentina. Their behavior is well studied, but we know little about their behavior toward the dead. We directly observed and filmed with a camera trap the reactions of a five-member herd of collared peccaries to the death of a herd member. We worked on a suburban forested area in the mountains of central Arizona. We found that the herd visited and spent time with the dead body for 10 days after the peccary died. The frequency of the visits declined until the cadaver was consumed by coyotes. Most of the videos showed two individuals visited the dead animal (44%), solitary records were also frequent (39%) and only 4% of the videos recorded three peccaries. Visits were more frequent during the night (64%). Peccaries do react to the death of a herd member by behaving in particular ways. Reactions include pushing at the dead individual, staring at it, biting it, and trying to pick it up by putting their snout under the corpse and pushing it up, and defending it from coyotes, among others. These levels of behavioral complexity for peccaries are beyond those known so far. The behaviors of this herd of peccaries resemble those of humans, cetaceans, chimpanzees, and elephants and show that these groups are not the only ones that react to death.

KEYWORDS

death, mortuary behavior, *Pecari tajacu*, social behavior, Tayassuidae

1 | INTRODUCTION

Humans show interest in the death of other humans and there is a great diversity in mortuary practices (Huntington & Metcalf, 1979). Elephants, chimpanzees, and some cetacean species have also been described to show concern with dead members of their species and respond to death in particular ways (Douglas-Hamilton, Bhalla, Wittemyer, & Vollrath, 2006; Dudzinski et al., 2003; Goodall, 1986).

Elephants, for example, spend time with the dead individuals, revisiting the dead body and showing behaviors such as sniffing the body, touching it, vocalizing or guarding the body, among others (Douglas-Hamilton et al., 2006). For chimpanzees, available information is mainly focused on reactions of members of a group toward the death of infants, although there are some reports of behaviors of members of a group when an adult dies (Stewart, Piel, & O'Malley, 2012). Among chimpanzees, behavioral responses seem to vary among individuals

and groups and may include dragging, shaking, and beating the dead body with disappointment (Stewart et al., 2012). Dolphins also come back to dead members of their groups, swimming in circles under the carcass, touching it, and remaining in vertical positions, among other reactions (Reggente et al., 2016). These species are considered exceptions among the mammals, which normally do not show much reaction in the dead bodies of other individuals of their species (McComb, Baker, & Moss, 2006).

Collared peccaries (*Pecari tajacu*) are gregarious animals, such as chimpanzees, elephants, and dolphins. Collared peccaries' groups maintain close and complex social relationships, living in cohesive groups with some degree of female philopatry (Biondo, Izar, Miyaki, & Bussab, 2014; Sowls, 1997). The number of animals in a herd varies from 2 to 50, but stable herds are considered to be of between 5 and 25 individuals with males and females of various age classes (Mayer & Brandt, 1982; Sowls, 1997). Peccaries maintain interindividual distances mainly by friendly interactions and cooperation although a few agonistic interactions have also been described (Biondo et al., 2014; Sowls, 1997). Grooming is common among individuals of a herd and it includes actions such as rubbing the side of the head against another peccary's hindquarters and scent gland (Sowls, 1997).

Collared peccary's behavior is well studied, but there is no published scientific information about the reaction of a herd toward the death of a member of the group. A reference in a newsletter (DesertUSA Newsletter) suggests that individuals may die separate from the rest of the group: "Members eat, sleep, and forage together. The exceptions are the old and infirm, who prefer to die in solitude." Observations on the behavior of herds of white-lipped peccary (*Tayassu pecari*) when an individual has been captured suggest that peccaries could also have particular behaviors toward death. For example, a herd of white-lipped peccaries remained near an animal that had been shot by hunters, thus making the whole group vulnerable to hunting. There have also been observations of peccaries pushing or biting individuals that are lying down due to illness or injuries (Rafael Reyna, *Pers. Com*). Additionally, researchers capturing white-lipped peccaries for radiotelemetry studies in Brazil, Mexico, and Costa Rica have each observed how the rest of the herd remains nearby checking on the captured animal continuously, lying down adjacent to the individual and remaining in close proximity for hours (Alexine Keroughlian, Marcos Briceño Méndez, and Mariana Altrichter respectively, *Pers. Com*). These casual observations indicate that the group cohesiveness is maintained even when one of the members is unable to follow the herd. However, reactions of peccaries to the death of a herd member have not been documented. In this note, we report on the behavioral response of a group of collared peccaries to the death of a herd member.

2 | METHODS

In early January 2017, the first author of this article (de Kort) was observing a group of five wild-ranging collared peccaries in a suburban forested area in the outskirts of Prescott, a town in the mountains of central Arizona. The natural vegetation in Prescott is composed of

ponderosa pines with several species of oak trees and bushes. De Kort detected an individual behaving in a way that suggested either illness or old age and a few days later, on January 8, he detected a dead peccary. We assume that the dead peccary was the one that was earlier struggling. Next to the dead peccary, there were two other members of the herd sleeping together. The other two members of the group were laying further up a hill. The herd dispersed in response to a barking dog but returned a few minutes later and remained on site sleeping and eating beside the dead individual. The group continued to return to the site. On January 10, we placed a camera trap 5 m from the carcass. Our aim was to capture any activity related to the dead individual. The camera trap was a motion-sensitive wildlife camera that records 10-s videos with 30-s time, and we set it up 5 m from the cadaver.

The camera was activated 24 hr a day during two weeks, and the first records were on January 11 around 1 a.m. (3 days after the animal had died). The camera captured 101 videos, 93 of which contained peccaries. We created major behavior categories and determined the time spent on each behavior. Considering the total time recorded by the camera, we estimated the percentage of time of each activity. We also determined the percentage of day and night activity. In addition to what was recorded by the camera, we count with personal direct observations and examination of the dead body; some of these are not recorded in video as they did not happen within the camera's range.

3 | RESULTS

Upon close examination of the dead individual, we determined it was a mature female. One day after the cadaver was detected, local people moved it 150 feet up the hill. The remaining peccaries of the herd kept on coming to visit the dead body rather than the physical site. During the first 3 days after the death, we observed that the group spent several hours next to the dead individual. Once the camera was set, the recorded amount of time spent around the dead animal declined progressively during 4 days (Figure 1). There was not activity during 1 day and then the group returned again, 9 and 10 days after the death occurred (Figure 1).

Most of the videos show two individuals visiting the dead female (44%), solitary records were also frequent (39%), and only 4% of the videos recorded three peccaries. The four remaining peccaries of the herd were never recorded at the same time close to the dead individual. According to our understanding, it is highly probable that the two individuals that visited the most often and slept next to the dead one were always the same. However, individual identification and age identification are not accurate for peccaries that are not handled (Sowls, 1997). Peccaries spent more time in the site during night (64%) than day hours. About half of the recorded time (48.5%), the peccaries were walking or standing within a distance of 5 meters of the dead individual (Table 1). Other activities included pushing at the dead individual, nuzzling it, smelling it, staring at it, biting it, and trying to pick it up by putting their snout under the corpse and pushing it up (Figures 2,3,4). Visiting peccaries also did grooming to each other (only detected when the number of visitors was 2) and rubbing on their scent glands and the

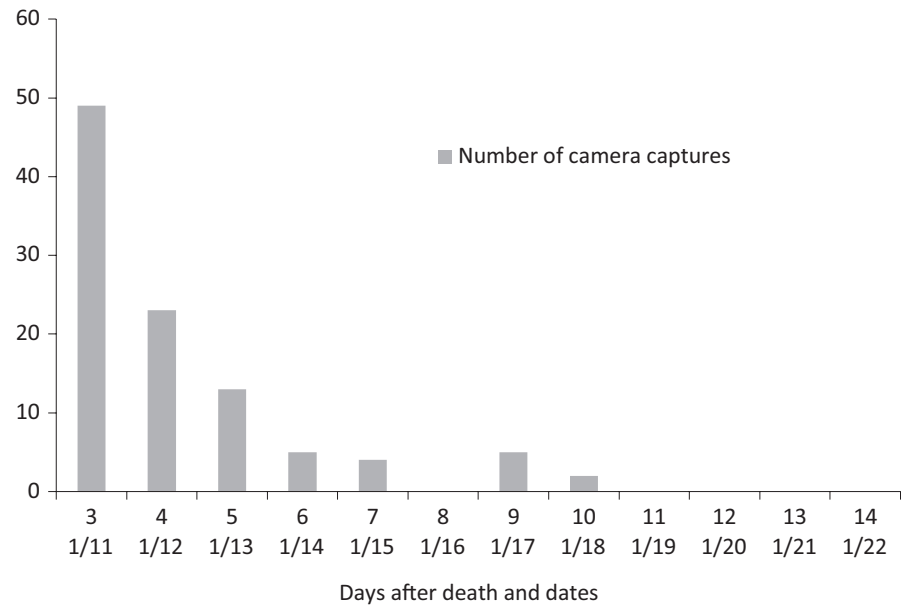


FIGURE 1 Number of camera captures as an approximate of activity of the collared peccary (*Pecari tajacu*) herd around a dead female member

gland of the dead individual. Individuals also slept beside the cadaver, sometimes in direct body contact with it and sometimes close to it (Figure 3, Table 1). We may have underestimated the time that visiting peccaries spent sleeping next to the dead individuals because the camera is only triggered when there is movement. Behaviors that included direct contact with the cadaver, such as touching, pushing, and sleeping next to it, were performed 36% of the recorded time (Table 1).

On January 18, a pack of four coyotes (*Canis latrans*) approached the site showing interest in the dead individual. We observed that the group of peccaries repeatedly chased away the coyotes, which tried unsuccessfully to attack from different angles. Later that night, the coyotes successfully accessed the corpse and the camera recorded them feeding (Figure 4). The camera did not record any further visits from the herd after that day nor were the peccaries personally observed in the area. As such, the peccaries spent a total of 10 days with their fallen herd member.

4 | DISCUSSION

Scientists believe that most animals do not have rituals or particular reactions toward dead individuals of their species (McComb

et al., 2006). However, it is rare to observe a natural death in the wild, and therefore, scarce information exists on this topic. Peccaries, social ungulates with herds of complex social structure and interactions, exhibited behavioral reactions toward a deceased individual similar to those detected in a few other highly social species. Collared peccaries returned to the dead member of their herd, maintained physical contact with it, and even guarded the carcass against coyotes. These are levels of behavioral complexity beyond that known so far. It is unlikely that the behaviors here described are a result of coincidence. Furthermore, these particular

TABLE 1 Percentage of time spent on each behavior category by collared peccaries (*Pecari tajacu*) in relation to a dead individual

Behavior category	Percentage of time recorded
Walking or standing near by	48.5
Touching the cadaver (nuzzling, smelling, biting)	15.4
Pushing (includes picking it up)	11.0
Sleeping next to cadaver	9.9
Social interaction with each other	8.2
Others	6.9



FIGURE 2 Pictures (snapshots of videos) of collared peccaries (*Pecari tajacu*) nuzzling and pushing the dead individual during the day (a) and night (b)



FIGURE 3 Picture of collared peccaries (*Pecari tajacu*) sleeping next to the dead individual (on the left), two days after the death occurred



FIGURE 4 Coyotes eating the corpse of the dead collared peccary (*Pecari tajacu*), ten days after the animal died

reactions resemble those of other species, for example, touching the dead body and trying to lift it up, were also described for elephants (Figure 2, Douglas-Hamilton et al., 2006), and the peccaries pushing and biting on the dead female resemble the shaking and frustrated beating of a chimpanzee group toward a dead member (Stewart et al., 2012).

There is definitely more research required for a better understanding of this topic. We cannot determine if there is grieving or what would have happened if the coyotes did not access the body. Neither can we state about the relation of the visitors and the dead female because although the most often visitors could be related to her, relatedness in collared peccaries is not associated with the rate of social interactions between individuals (Biondo et al., 2014). Therefore,

individuals that most often visited the dead female could be genetically unrelated to her. This would coincide with observations for elephants that show generalized responses to death, not restricted to kin (Douglas-Hamilton et al., 2006).

Observing and reporting spontaneous events in nature allow the formulation of new questions and the effective design of future research focused on this topic. According to our observations, primates, elephants, and cetaceans are not the only mammals that show a particular response to the death of a member of the herd.

ORCID

Micaela Camino  <http://orcid.org/0000-0002-7375-6277>

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