

# PATHOLOGY OF ZOO ANIMALS

A Review of Necropsies Conducted over a  
Fourteen-year Period at the San Diego Zoo  
and San Diego Wild Animal Park

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# 51

## Mammals

### Order Perissodactyla

We have exhibited 17 species from three families of Perissodactyla with a record of mortality shown in Table 161.

Perissodactyls, including rhinos and tapirs, are found in Europe, Asia, Africa and South America. The anatomy of internal organs of rhinoceroses and tapirs is similar to that described in veterinary textbooks for the horse. However, a comment on a misconception concerning the male genitalia of the rhinoceros is in order. The testes of a rhinoceros are not normally within the abdomen but dropped to a subcutaneous location. Yet, because no pendulous scrotum exists, these organs are not grossly apparent, leading to the misconception that the testes are intra-abdominal. One other note: in one adult Malayan tapir we found incomplete adhesions of parietal and visceral pleura. We do not know, however, whether this is normal, as in the elephant, or whether it indicates a pathologic alteration of the pleura.

### Family Rhinocerotidae

Of 32 southern white rhinoceroses, and three Indian rhinoceroses born at our Wild Animal Park, six of the southern whites and two Indian rhinoceroses died within the first six months of life. A female Indian rhinoceros dropped three calves, two males and one female. Both

TABLE 161. Perissodactyl mortality and births

Family Species	No. necropsied	Male	Female	Sex not recorded	Zoo births	Wild Animal Park births	Neonate deaths	Perinate deaths
TAPIRIDAE								
South American tapir	8	4	4		6		3	
Baird's tapir	1	1			6		1	
Malayan tapir	7	2	4	1	8		2	1
RHINOCEROTIDAE								
Black rhinoceros	2	1	1					
Southern white rhinoceros	10	2	8			32	4	2
Northern white rhinoceros	2	1	1					
Indian rhinoceros	3	2	1			3	2	
EQUIDAE								
Przewalski's horse	7	6	1		8	15	4	
Damara zebra	6	3	3		11		2	
Grant's zebra	8	3	5			8		
Hartmann's mountain zebra	14	6	8		13	8	4	1
Grevy's zebra	20	9	11		6	41	6	
Persian onager	2	2			7		1	
Sardinian ass	3		3				2	
Transcaspian kulan	2		2			2	1	
Burro	16	4	9	3			8	
Clydesdale horse	1		1			1	1	

males died; one, which weighed 55 kg, after one day, and the second, at 48 kg, after three days. Both, weak at birth, never stood on their feet or nursed. Their ribs had not expanded the thorax to allow normal function. A moderate cecitis and peritonitis were noted in the older calf, but no pathogens were isolated.

Of the six southern white rhinoceros calves necropsied, one was a stillbirth, three were less than twenty-one days of age, one was six weeks of age and one lived for six months. One of the neonatal calves was weak at birth and no lesions were seen at autopsy. Two of the other neonates had been traumatized. The six-week old calf had omphalophlebitis and had developed an *E. coli* valvular endocarditis.

The two northern white rhinoceroses were old adults which had been sent to the Wild Animal Park from other zoos in the hopes that the large exhibit area would be conducive to breeding.

#### STRESS, TRAUMA, AND MALNUTRITION

Stress, resulting from transport, anesthesia or fighting was a major factor in the deaths of three southern white rhinoceroses and one black rhinoceros, and may have been a contributing factor in the death of the female northern white rhinoceros.

Shortly after the arrival in 1971 of 21 southern white rhinoceroses shipped from Durban, South Africa, by freighter to Houston, Texas, and then by train to San Diego, two of the animals succumbed. Both had traumatic lesions on their feet and legs, and a septicemia had developed.

In 1973 a female southern white rhinoceros was harrassed by other animals in a 125 acre enclosure at our Wild Animal Park and had to be subjected to euthanasia.

The male black rhinoceros was sedated with M-99 and acepromazine in order to examine and treat him. Unfortunately, when he lost consciousness, he fell on his back in a narrow moat and died from respiratory failure before he could be pulled out.

A 270 kg southern white rhinoceros calf, six months of age, died of malnutrition. Reviewing this case, one believes that stress caused by pen mates may have contributed greatly to the animal's poor condition. This was the only rhinoceros death related to metabolic disease or malnutrition.

## INFECTIOUS DISEASE AND PARASITES

A female black rhinoceros at the Zoo developed an acute vesicular dermatitis which rapidly spread over her entire body, with the greatest number of lesions located on her back. After becoming increasingly dehydrated, she died in spite of attempts to treat the condition. We believed the disease to be viral, but a diagnosis could not be confirmed either by isolating a virus or finding inclusion bodies. Histopathologic studies revealed that there had been some suppression of the lymphopoietic system. The disease did not spread to her pen mates.

The only other infectious diseases observed were two cases of omphalophlebitis in two southern white rhinoceros neonates.

Parasites have not been a problem in the rhinoceros, even though a few "bot" larvae were found in the stomachs of southern white rhinoceroses. The species of *Gastrophilus* was not determined, but the larvae were almost twice the size of the "bots" commonly seen in equines.

## SYSTEMIC DISEASES

Biliary hepatitis was noted in the livers of two southern white rhinoceros and a female northern white rhinoceros. The latter presented a case of special interest because she had been harrassed by other animals and frequently driven into a large pond in the enclosure. When we removed and incised her liver, we found a large amount of well masticated plant material impacting the major bile ducts. The animal, we postulated, must have forcefully regurgitated intestinal content, then, with the pylorus of her stomach closed, experienced retrograde peristalsis sufficient to force some intestinal contents into the bile ducts.

An old male northern white rhinoceros, already in poor condition, died. His small intestine was impacted with coarse food, possibly the result of incomplete mastication. Yet when we examined his teeth, we found no dental problem that was likely to have caused incomplete mastication.

## PROLIFERATIVE DISEASES

An old female Indian rhinoceros was sent from the Philadelphia Zoo to our Wild Animal Park in hopes that she would be bred by our male.

She became increasingly debilitated and died. Our examination revealed multiple large leiomyomas in the uterus and cervix. These lesions were so extensive that they probably would have prevented successful pregnancy.

## Family Tapiridae

From the three species of tapirs which have been exhibited at the San Diego Zoo, 16 were submitted for necropsy (Table 161). These include two South American species—the common or Brazilian tapir, and Baird's tapir—and one Asiatic, the saddleback or Malayan tapir. The Malayan species is largest, sometimes exceeding 350 kg in weight; whereas the two American species rarely exceed 250 kg. All three species have a heavy, swine-like body, short legs and short tails. The elongated nose and upper lip form a highly mobile, short trunk. Tapirs have a good sense of smell.

Tapirs have sanitary habits; they commonly defecate in one area, for example. Our tapirs usually defecate in water, and we think that a pool of water reduces the incidence of rectal prolapse.

While tapirs are normally considered to be somewhat solitary, zoos have had moderate success exhibiting groups of both sexes. However, there have been reports of occasional violent aggression toward pen mates, commonly by males, in what theretofore had been a compatible group.

### STRESS, TRAUMA, AND MALNUTRITION

Severe injuries inflicted on a pregnant female directly contributed to her death. A male sustained extensive injuries to his head, abscesses developed and he had to be put to death. One newborn South American tapir was killed by other tapirs in the enclosure. Sernylan and M-99 were used to anesthetize a South American tapir and a Malayan tapir, both of which had suffered a rectal prolapse. Both animals went into shock, regurgitated and then inhaled their stomach contents. The lungs were congested and edematous.

Nineteen tapirs, six South American, six Baird's and seven Malayan, were born in the Zoo. Of these the six neonates that died comprised 37 percent of our tapir mortality. A seventh animal died at one and one-half months of age from enteritis and renal calculi. Our small