

## PARASITES AND MORTALITY OF SABLE *HIPPOTRAGUS NIGER NIGER* (HARRIS, 1838) IN THE MATOPOS, ZIMBABWE

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*Abstract* — Parasitism is indicated as the main cause of mortality of sable *Hippotragus niger niger* in Matopos, Zimbabwe. The main external parasites were *Rhipicephalus appendiculatus*, *R. evertsi* and the larvae of *Chrysomya bezziana*. The main internal parasite was *Haemonchus* and to a lesser extent *Taenia multiceps*. *Babesia* and anaplasmosis were identified in blood smears.

### *Introduction*

Little has been published on the parasites of sable *Hippotragus niger niger* (Harris, 1838). Condy (1963) found a sable from Wankie National Park to be infected with *Haemonchus*. (Morris *pers. comm.*). A high incidence of *Cytauxzoon* parasetaemia was found in samples of sable from the Percy Fyfe Nature Reserve (Republic of South Africa) by Wilson & Hirst (1977) who also diagnosed *Chlamydiosis* complicated by babesiosis and pneumocytosis as the cause of death of one sable calf. They also recorded *Babesia* infection in two immature sable that died.

During a detailed study of the sable in the Rhodes Matopos National Park (Grobler 1978), parasites were collected and identified. The identifications were done by members of the Veterinary Department of Rhodesia.

### *Results*

#### *External parasites*

No total tick counts were attempted but one adult male sable yielded nearly 4 000 engorged female ticks. Nine species of ticks were identified from a random sample of 1 477 ticks collected from sable during December-February, 1971-1977. *Rhipicephalus appendiculatus* (71,6%) and *R. evertsi* (21,2%) made up the bulk of the sample, followed by *Boophilus decoloratus* (3,5%) and *Amblyomma hebraeum* (3,1%). The remaining species (*Hyalomma rufipes*, *H. truncatus*, *R. appendiculatus* (Zambesi variety), *R. simus* and *R. pravus*) made up less than 1% of the sample.

*B. decoloratus* was common on the mane, *R. evertsi* on the anus, inguinal region and under the forelegs, and *R. appendiculatus* on the mane, ears and body in general. Infestation on the manes was particularly heavy and often left large scars on older animals.

Tick infestation often resulted in extreme anaemia with animals in poor condition. Large open wounds also developed as a direct result of heavy infestation and some newborn calves exhibited such high tick infestation that the entire inner surface of the ear including the orifice were covered in ticks. Even with the average adult, tick infestation was moderately heavy.

Six adult sable were destroyed in 1976 and 1977 due to large rotting wounds in the perineal area. These were assumed to be initiated by tick wounds into which *Chrysomya bezziana* (blue flies) deposited their eggs. The first stage larvae feed upon blood and lymph, the second stage larvae invade healthy tissue and the final third stage larvae are almost completely embedded in living tissue before they are fully fed and drop to the ground to pupate (Askew 1971). The maggots or screw-worm of *C. bezziana* turn the wound into a rotting mass of flesh eventually killing the animal.

An adult female collected in February 1977 with a large rotting hole in the perineum showed extreme irritation, continually moving and stopping only to attempt to lick the wound or to sit as a means of comfort. She was also heavily tick infested and on centrifuging a blood sample in a heparinized tube, the packed cell volume was found to be 12% as opposed to a normal packed cell blood volume of 30% in Matopos sable.

Ticks undoubtedly played a major role in mortality of the study population. There was good circumstantial evidence to indicate that healthy sable could cope with moderately heavy tick infestations, but as soon as an animal became ill and went down in physical condition, the tick infestation would increase and rapidly deteriorate the situation. Ticks also played a part in disease transmission.

#### *Internal Parasites*

An adult female at the point of death was collected in December 1973. On examination she was found to be anaemic, oedematus and the abomasum contained a massive infestation of wire worm (*Haemonchus* sp.). The large intestine had a few nodular worms (*Oesophagostomum* sp.) and the rumen contained a small number of conical flukes (*Paramphistomum* spp.).

Nodular worms were found subsequently in other animals and may in heavy infestations cause peritonitis. Conical flukes were common in sable and other ungulates in Matopos but were not harmful to the animals. Death in the above animal would have been caused by the blood sucking activities of the wireworms. This highly pathogenic worm was suspected to be the main mortality cause in the study area during extensive moist conditions. *Haemonchus contortus* is up to 35 mm in length, about as thick as a pin and has a distinct dark pink to red colouration as a result of ingesting blood.

Tapeworms (*Taenia* sp.) were sometimes present in the intestines of sable. A six month old female was destroyed and examined in September 1977 after it was found about 1 000 m from a breeding group. The animal was obviously terminally ill and had a bloated look about the abdomen. On examination, the throat muscles and the base of the tongue were found to be heavily infested with tapeworm cysts. These small cysts (about 10 mm in diameter) were found throughout the body and was the

obvious primary cause of the animals condition.

Another poorly known tapeworm species was found to be lethal under certain circumstances. This was a member of the genus *Multiceps*, also referred to as *Taenia multiceps* and *T. coenurus* which occurs as the adult worm in carnivores. The intermediate form called *Coenurus cerebralis* occurred as a hydatid cyst with a large number of scolices each bearing 32 hooks.

Two tame females, one at nine months and one at 14 months old died as a result of a large *Coenurus* cyst in the frontal portion of the brain, in the vicinity of the olfactory bulbs. Because the cyst was displaced to one side, the animals became disorientated and towards the end would fall over trying to correct the direction in which they wanted to move. The same type of cyst was found in the urinary bladder of a dead adult female and on various parts of the internal body cavity in other sable. In the latter there was no indication that the cysts were causing illness.

An adult male which was found lying down and obviously ill was collected for examination. Suspected cerebro-spinal nematodiasis from migrating *Setaria* worms was diagnosed. *Seteria (Artonema)* worms were common in the mesenteric membranes of sable and were generally non-pathogenic.

#### *Bacteria, viruses and blood protozoans*

In view of the high tick density there was always the danger of tick borne diseases such as Babesiosis or Piroplasmosis. This is generally a relatively large protozoan parasite within the red blood cells. Transmission in southern Africa is by *Boophilus decoloratus*, *Rhipicephalus appendiculatus* and *R. evertsi* (West 1975). Scanty *Babesia* (redwater) was recorded in two blood smears taken from 36 healthy animals while one adult male died from the disease. At the time of death the animal was thin, tick infested and passing dark brown/red urine.

Anaplasmosis or Gall-sickness is another possible tick borne disease that may effect sable. The casual agent is *Anaplasma marginale* which can be transmitted through vectors such as *Boophilus* and *Rhipicephalus*. Two blood smears out of 46 showed a scanty presence of the agent.

Wilson & Hirst (1977) showed a significant correlation between *Cytauxzoon* incidence and packed cell volume if they excluded data from Matopos. A small sample from Matopos was examined by them and represented an interesting deviation from the pattern, since their body condition was good yet they had a *Cytauxzoon* incidence of 88%.

#### *Discussion*

Parasitism was considered the main cause of mortality in Matopos although some died from predation by leopard *Panthera pardus* (Grobler & Wilson 1972; Smith 1977), injuries from fighting and natural injuries. One adult male was found dead with his head stuck low down in a fork of a tree.

Sick sable in the study area invariably wandered off on their own in the terminal stages to die, often in thick cover. This complicated estimation of when animals

died as carcasses were sometimes found months after death had taken place. A total of 68 carcasses were collected from 1971-1978 in which time of death was determined to the nearest month. These were mostly animals over one year old since rapid decomposition disposed of skeletal material from young animals.

In the sample of 68 there were 26 (38,23%) recorded for November and December. The rest were evenly scattered through the rest of the year at a mean number of 4,2 (range 2-6) per month. The main period of mortality for older animals thus took place in the hot wet season following the food limiting hot dry season and corresponding with conditions suitable to parasites. Any weak animals as a result of stress undergone during the hot dry season are thus likely to succumb to parasites during the hot weather.

A negative correlation was found between calf survival to eight months old (based on 1971-1977 population census data) and the preceding annual precipitation ( $r=-0,74$ ). A high neonatal mortality was evident during February and March between expected birth rate, as predicted from the number of pregnant adult females, and actual survival rate. In February 1978 for example 18 females in one herd were expected to give birth and by March 1978 there were only seven surviving calves. No fresh carcasses were found for examination but parasitism, especially tick infestation was the most likely cause of the high neonatal mortality.

There was also a second phase in mortality of young sable, this was quantitatively assessed in 1977 from June — November. There was a gradual loss of 39% of young of year in five selected herds over the period August — November with most losses occurring in August and September. This second phase in mortality related to a downward trend in food nutrient quality and weaning.

The density of sable and other ungulates in the study area were unable to cope with the grass when it was available in super abundance as a food source during the rains. This caused vast areas to remain under-utilised resulting in a dense grass cover, shade and moist conditions all of which benefits both ticks and endoparasitic worms. Moist conditions and shade for egg hatching and larval development, and dense grass for gaining access to hosts are both vital requirements for the parasites. The areas of highest tick densities were the moist areas favoured by sable during the hot dry season and was probably directly associated with concentrated tick "fall-off".

Young (1969) points out that wild species tend to manifest few recognisable signs of disease, succumb rapidly when they are infected and are either killed by predators, or are rapidly disposed of when dead. He considers that diseases and parasites can play an important part in the regulation of wildlife populations and may explain many of the cases where populations have failed to grow as expected.

The regulation and stability of host-parasite interactions is of obvious importance to the sable situation. Destabilizing processes such as poor forage quality, ideal situations for rapid turnover in parasites, physical injury, old age and imbalance in energy expenditure would upset the equilibrium of the host-parasite relationship and cause mortality. The internal parasites were a primary cause of sable mortality while the external parasites were in most cases secondary to other factors which influenced rate of infestation.

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