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SHORT COMMUNICATION

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Necropsy and parasitic findings from an adult forest buffalo (*Syncerus caffer nanus*) found dead in the Republic of Congo

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Abstract A field necropsy was performed on a recently dead adult forest buffalo, *Syncerus caffer nanus*, found in the Nouabalé-Ndoki National Park, Republic of Congo. Based on the gross and histological lesions, the cause of death was determined to be conspecific fighting. Ectoparasites collected from this forest buffalo were *Amblyomma* sp. (larvae) and *Rhipicephalus ziemanni* Neumann. Endoparasites collected included a paramphistomid trematode, *Carmyerius gregarius*, and oocysts of *Eimeria* spp., paramphistomid eggs (presumably from *C. gregarius*), metastrongylid lungworm larvae, and strongylid eggs. Parasitic findings from this forest buffalo were compared to previous reports from savanna and forest buffalo.

Keywords Endoparasites · Ectoparasites · Forest buffalo · Nouabalé-Ndoki National Park · Republic of Congo · *Syncerus caffer nanus*

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Introduction

Little is known about the forest buffalo, *Syncerus caffer nanus*, or its parasites. Although ample parasite data exist for the African savanna buffalo (*S. c. caffer*), there have been relatively few studies on parasites of the forest buffalo. This paper describes the necropsy findings and parasite load of a freshly dead adult male forest buffalo in the Republic of Congo.

Materials and methods

The study site was a small, shallow forest lake embedded in continuous lowland rainforest in the northern Republic of Congo, at 2°13.5′N, 16°12.5′E, west of Nouabalé-Ndoki National Park. This lake is regularly monitored for large mammal activity because forest elephants (*Loxodonta africana cyclotis*), forest buffalo and, occasionally, bongo antelope (*Tragelaphus euryceros*) use it as a source of digestible forage provided by the abundant algae growing in the water (F. Maisels, unpublished data).

On the morning of 23 July 2001, a dead adult male buffalo was found floating in the lake. The animal was first positively identified on 27 February 2001. He was seen again on 3 March 2001, and 8 and 29 June 2001, in good health at all times. When found dead, this buffalo was in good flesh and had no signs of starvation or illness. The buffalo was determined to have been dead for approximately 84 h prior to necropsy, since the site of death had been visited by the monitoring team on the afternoon of 20 July.

The buffalo had a long scratch on its thigh, and there were a number of puncture wounds on the skin of the flanks. The small intestine was protruding from two of the wounds. The puncture sites were slightly elongated. There was a large amount of internal bleeding associated with a laceration and puncture into the muscles of one thigh.

A field necropsy was carried out on 24 July 2001, and specimens were collected for histological and parasitological examination. Feces were removed manually from the rectum, and gastrointestinal material was collected from the stomach, small intestine, cecum, and colon. Feces and gastrointestinal material, including a single adult parasite collected from the stomach, were preserved in 90% isopropyl alcohol. Ectoparasites were collected and stored in 90% isopropyl alcohol. Representative tissue samples were collected for histological evaluation and preserved in 10% buffered formalin. The specimens were transported to the Field Veterinary Program, Wildlife Conservation Society, in New York, USA.

Zinc sulfate flotation was used to identify endoparasites from fecal samples and material removed from the gastrointestinal tract. The single adult fluke, collected from the stomach, was identified to species using a dissection scope. Adult ticks were identified on the basis of external morphology, using the keys of Walker et al. (2000) and Matthysse and Colbo (1987).

Results and discussion

Histological evaluation confirmed skin infection, glossitis, and an infected salivary gland; none of these findings should have contributed to the cause of death. The most probable explanation for the death of the buffalo was an attack by a conspecific. After examination of photos of the animal and details of its wounds, leopard attack was ruled out (P. Henschel, personal communication) as there were no parallel scratches such as might have been made by leopard claws; there were no bite marks on the throat, and no wounds on the back (Bailey 1993). Forest buffalo, when fighting, typically target the flanks and underside of their adversary (Korte 2003 and personal communication after examination of photos). Moreover, the remains of adult buffalo, even forest buffalo, have not yet been recorded in leopard scat, although the remains of juvenile buffalo have been identified (Pienaar 1969; Bailey 1993; Fay et al. 1995; Henschel et al. 2004). Other studies in the forest region have also never identified buffalo remains in leopard scat (Hart et al. 1996; Ososky 1998; Ray and Sunquist 2001).

Two tick collections were obtained from the buffalo's skin: *R. ziemanni* Neumann (five males, two females) and *Amblyomma* sp. (2 larvae) (immature stage of African *Amblyomma* cannot be determined to species using morphological characters). *R. ziemanni* ranges over tropical western and central Africa, from southern Senegal to Rwanda and Burundi. Numerous collections have been made from *S. c. caffer*, although some authors regard the larger forest antelope, such as the bongo and bushbuck, as preferred hosts. Other workers state that *R. ziemanni* will infest practically all ungulates and carnivores living in forest areas, and occasionally humans and monkeys (Walker et al. 2000).

A paramphistomid trematode, collected from the stomach, was identified as *Carmyerius gregarius*. Endoparasites identified from the zinc sulfate flotation of the feces and the gastrointestinal material included oocysts of *Eimeria* spp., paramphistomid eggs (presumably from *C. gregarius*), metastrongylid lungworm larvae, and strongylid eggs. If this sample had been from a domestic cow, the two *Eimeria* species would have been *E. auburnensis* and *E. ellipsoidalis*. Additionally, a single larval *Amblyomma* sp. was detected in the gastrointestinal tract.

Although ample parasite data exist for the free-ranging African savanna buffalo (*S. c. caffer*), there have been relatively few studies on parasites of the forest buffalo. The published tick collections from *S. c. nanus* list 15 species that appear to us to have been correctly identified: *A. astrion* Dönitz (Santos Dias 1964), *A. cohaerens* Dönitz (Rousselot 1953), *A. pomposum* Dönitz (Rousselot 1953), *A. splendidum* Giebel (Aeschlimann 1967), *A. variegatum* (Fabricius) (Morel and Mouchet 1958), *Hyalomma truncatum* Koch (Morel and Mouchet 1958), *R. appendiculatus* Neumann (Walker et al. 2000), *R. complanatus* Neumann (Fain 1949), *R. compositus* Neumann (Santos Dias 1964), *R. kochi* Dönitz (Santos Dias 1964), *R. longus* Neumann (Aeschlimann 1967), *R. lunulatus* Neumann (Tendeiro 1952), *R. pseudolongus* Santos Dias (Morel 1965), *R. senegalensis* Koch (Morel and Mouchet 1958), and *R. ziemanni* (Morel and Mouchet 1958). Diseases of veterinary significance vectored by these tick species include theileriosis (*R. appendiculatus*), babesiosis (*R. lunulatus*), and cowdriosis (Afrotropical *Amblyomma* spp.). To date, *R. ziemanni* has not been associated with any animal or human disease (Walker et al. 2000). The authors know of no reports on the endoparasites of *S. c. nanus*.

Necropsies, such as the one performed on the forest buffalo in this study, can be conducted on any animal found dead, and will provide critically needed baseline information that only requires training in proper sample handling and human safety precautions (Deem et al. 2001). Studies on the diseases and parasites of wild animals should be incorporated into ongoing ecological studies (Deem et al. 2001).

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