

Dentition and Life History of a 16-year-old Known-age Free-living Male Lion *Panthera leo* (Linnaeus, 1758) from the Kruger National Park

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Whyte, I.J. and G.L. Smuts. 1988. Dentition and life history of a 16-year-old known-age free-living male lion *Panthera leo* (Linnaeus, 1758) from the Kruger National Park. — *Koedoe* 31: 99–104. Pretoria. ISSN 0075–6458.

Wear in the dentition of a known-age, free-living, 16-year-old male lion is described and compared to existing age-determination techniques. Aspects of his life history are described as they are in some contrast to what is known of male lions' life history strategies.

Key words: Age determination, dentition, known-age, Kruger National Park, lion.

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Introduction

A five-year-old male lion *Panthera leo* from the Kruger National Park (KNP) was permanently marked by a hot branding process and was destroyed eleven years later at the age of 16 years. The age determination technique for lions described by Smuts, Anderson & Austin (1978) was largely based on the eruption sequence and subsequent wear of the dentition of 43 known-age skulls. The oldest of these skulls was from a 14–15-year-old male from the Kalahari Gemsbok National Park. The skull of this 16-year-old lion is older than any in this collection and thus represents a useful contribution to this technique and gives some confirmation of the patterns of wear to be found in old age lions as described by these authors.

This animal was of further interest as, after he had been evicted from his pride by other males, he apparently managed to regain his membership of the pride. This is in contrast to what has been described of the fate of such evicted old males (Bertram 1978; Schaller 1972) and these two aspects seem worthy of being placed on record.

Methods

The lion in question (male No 3) was originally captured and marked at Rietpan in July 1974 (Site (a) Fig. 1) as part of a survey of the lion population in the Central District of the KNP (Smuts 1976). The capture methods followed those of Smuts, Whyte & Dearlove (1977, 1978) and the age at capture determined after the method later to be published by Smuts,

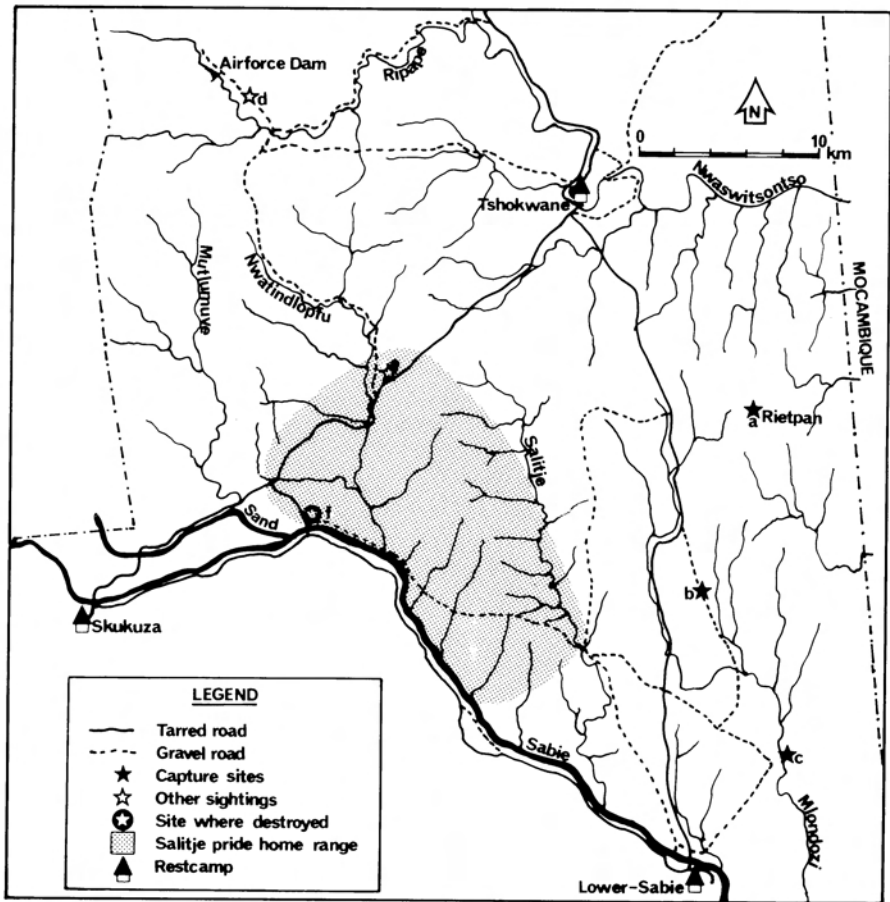


Fig. 1. The observed lifetime range of a 16-year-old known-age male lion in the Kruger National Park.

Anderson & Austin (1978). His age at the time could be reliably determined as five years. At this age, the eruption of the permanent dentition is complete and wear is just apparent and this, in conjunction with the dimorphic sexual characteristics of young males, enabled an accurate estimate of age (Smuts, Anderson & Austin 1978) and a reasonable degree of confidence in considering him to be a "known-age" animal.

He was hot branded with a large number "3" on his rump. Dimensions of the brand were approximately 18 cm × 12 cm and this mark remained clearly visible for the rest of his life. As he was the only lion marked with this "3" brand, his identity at death was beyond doubt. He was destroyed in August 1985 for humane reasons as he was extremely emaciated and was incapable of walking. At death his body weight was exactly 100 kg — 53,3% of the normal mean for an adult, healthy, KNP male lion (Smuts, Robinson & Whyte 1980).

Observations on this lion were incidental and included reports from staff and tourists in the KNP.

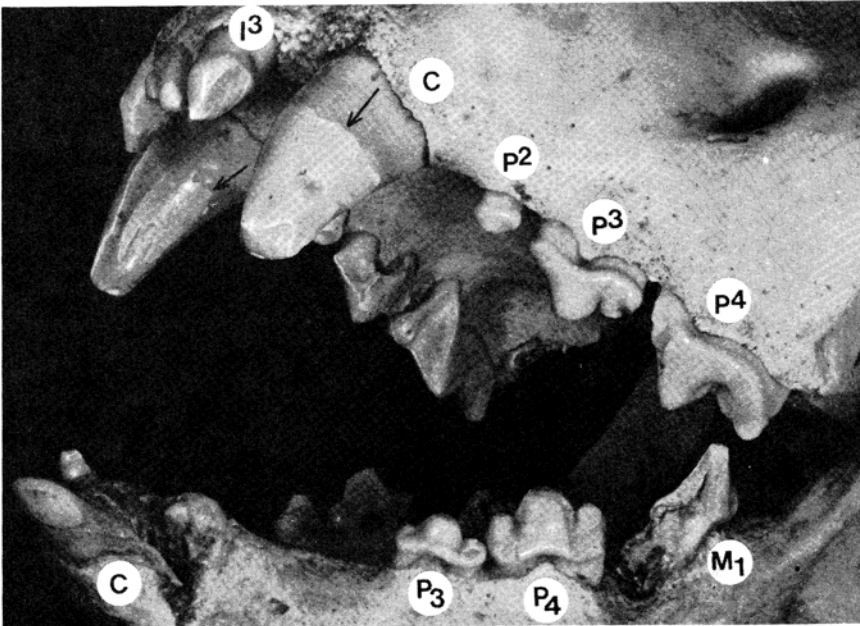
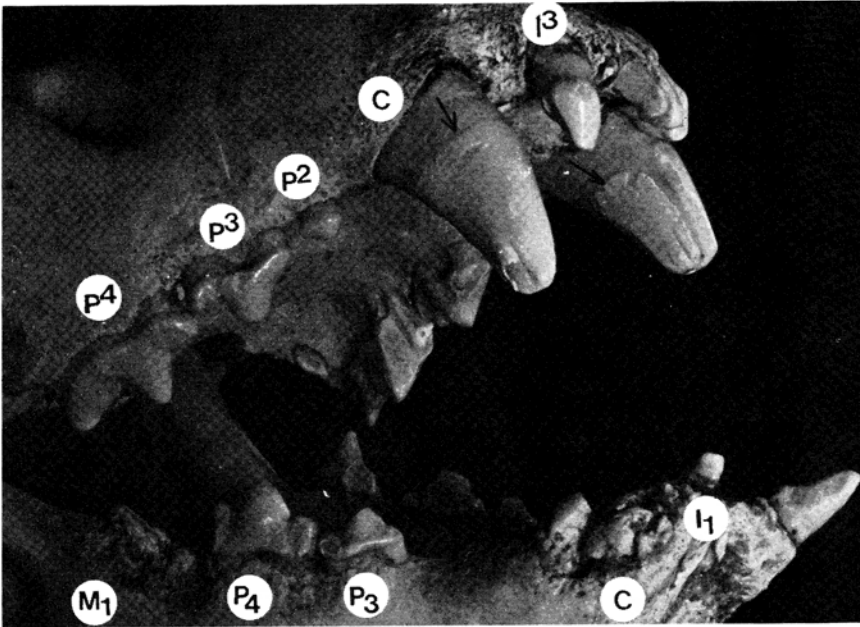


Fig. 2a & Fig. 2b. Right and left antero-lateral views of the maxillary and mandibular dentition. Note the periodontitis of the mandibular bone tissue around the alveolus of M₁ on both sides and the transverse fracture of the mandible through the symphysis which split both canines. Note also the wear on the molars and premolars.

Results

Dentition

The condition and wear of the teeth of this lion at death (Figure 2a and 2b) conformed well to the descriptions (and photograph of a known age specimen in a similar age class) given by Smuts, Anderson & Austin (1978) of the expected wear in a lion of this age. Individual variation is to be expected in such old animals, and in this animal's case, the mandibular molars (M_1) on both sides had broken or crumbled due to lack of support caused by severe periodontitis of the mandibular bone tissue around the alveolus. Wear on the other mandibular premolars and maxillary molars and premolars is conspicuous though not excessive.

The mandibular canines had both been split perpendicularly (crown to root) due to an extraordinary injury which had also caused a transverse fracture of the mandible through the symphysis. The fracture had apparently healed only recently leaving the anterior remnant of the left canine protruding from the mouth. Only one mandibular incisor (I_1 on the right side) was visible above the gum line — the rest presumably having been broken or lost as a result of the same accident which had caused the fracture. The cause of this unusual fracture is unknown, though it must have severely impaired his feeding style and contributed to (if not caused) the extremely poor physical condition that he was in. The maxillary canines and incisors showed the normal patterns of wear for a lion of this age though I^1 and I^2 on the right side were broken off below the gum line.

Life History

When he was marked, male No 3 was in the company of two other males of the same approximate age. They were recaptured at Sites (b) and (c) (Fig. 1) in October, 1975 and October, 1976 respectively. It was evident on both of these occasions that these males were still nomadic. Two of these males (including male No 3) subsequently became pride males of the "Salitje" pride and were often seen by tourists and staff. Figure 1 shows the approximate home range of this pride. They maintained tenure of this pride until approximately December 1982 (the last report of him in this area).

Seven months later he was seen well outside the Salitje pride area near the Airforce Dam (A.J. Hall-Martin *pers. comm.*¹) at Site (d) — Figure 1. He was with another adult male, presumably his lifelong confederate, and had apparently been evicted by a new alliance of males. Both were in reasonable physical condition at the time.

No further reports of him were received until he was seen again by one of us (IJW) back in the Salitje pride's area (Site (e), Fig. 1) in April, 1985. Of particular interest was that he had rejoined the Salitje pride and was in the company of a prime adult male, two adult females, a two-year-old male and three

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one-year-old lions of uncertain sex. By this stage he was in very poor condition and the canine protruding from his front lip could be seen. No aggression was shown to him by the younger adult male. They were walking side-by-side along the tarred road, and the impression was that he had again become a tolerated member of the pride. A day later he was again seen at the same place with the same group (R. Bengis *pers. comm.*²). When he was destroyed at Site (f) (Fig. 1) four months later he was still apparently a member of the Salitje pride.

Discussion and Conclusions

The evidence that this male had been reaccepted as a member of a pride from which he had been evicted is as follows.

- a) He was seen on two occasions with the pride in the close proximity (< 1,5 m) of a prime adult male and no aggression had been shown to him.
- b) The site at which he was shot four months after having been seen with the pride was still within the pride's territory which suggests that no attempt had been made to evict him.
- c) Pride males are extremely aggressive towards other trespassing males and interactions between such groups can lead to fatalities. At post-mortem he showed no evidence of violent interactions with other lions except perhaps for the injury to the mandible. The nature of this injury was more suggestive of one obtained during an interaction (e.g. a kick) with a robust prey animal than of an injury (e.g. a bite) inflicted by another male lion. His condition could be related only to starvation (possibly as a result of the injury to the mandible) and a heavy load of parasites, particularly *Taenia* spp., *Echinococcus granulosis* and *Trichinella nelsoni* (R. Bengis and L.E.O. Braack *pers. comm.*). (Note: *T. nelsoni* was previously classified as *T. spiralis*, but the *Trichinella* found in wildlife is now recognised as a separate species (A. Verster, *pers. comm.*³).

His reacceptance into the pride is in some contrast to what has been described of the fate of old lions evicted from prides (Bertram 1978; Schaller 1972). These lions are forced to become nomadic again and are harassed by pride males whose territories they may enter. They move a lot, trying to avoid contact with pride males. In the Serengeti system, these males can move out onto the plains and follow the migratory herds. The transient food source here does not allow the establishment of permanent prides and thus they are relatively free of harassment by other males (Bertram 1978; Schaller 1972). In the KNP, the whole area appears to be taken up by permanent prides (Smuts 1976; Whyte 1985) and this relief is not available. Having lost the benefits of cooperative hunting in a pride they are forced to hunt and/or scavenge when and whatever they can but reduced food availability, harassment and parasites then quickly reduce a male to a condition where hyaenas may overpower him or else, desperate for food, he may try to gain access to another pride's prey

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and be killed or severely injured by the resident males. Male No 3, however, seems to have achieved his extreme age by once more gaining access to a pride despite the presence of at least one resident pride male.

Acknowledgements

Thanks are due to Drs Roy Bengis and Leo Braack for information on the lion's body mass and parasite load at post-mortem. Drs Bengis, V. de Vos and W.P.D. Gertenbach also made useful comments on an earlier draft of the manuscript. Mrs Merle Whyte typed the manuscript.

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