
Short communication

The past distribution of giraffe in KwaZulu-Natal

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Giraffe (*Giraffa camelopardalis*) are thought to be introduced aliens in KwaZulu-Natal, an area in which they flourish today. This perception was based on the lack of reference to sightings of giraffe in early colonial literature and the lack of giraffe remains in archaeological sites within KwaZulu-Natal. We have reviewed the literature and found no reliable reference to giraffe in early colonial writings and no reports of rock art featuring giraffe in the area. However, there are recent reports of the recovery of giraffe bones from the Middle Stone Age deposits at Sibudu Shelter, the Holocene hunter-gatherer deposits at Maqonqo Shelter and from the Early Iron Age agriculturist site of KwaGandaganda, all within KwaZulu-Natal. We argue that giraffe were present 1000 BP (date of most recent excavation evidencing giraffe remains), but had died out or been extirpated by c. 220 BP (date of written accounts). The demise of giraffe between 1000 and 220 BP may be linked to disease, climate change or anthropogenic causes. The finding of giraffe remains within KwaZulu-Natal raises the possibility that they should be considered as native to the area.

Key words: *Acacia*, alien, archaeology, biodiversity, bones.

Giraffe (*Giraffa camelopardalis*) are currently common in the game reserves of KwaZulu-Natal. These animals flourish in the reserves in which they exclusively browse on trees and normally above the browse height of any other herbivore (Bond & Loffell 2001). Giraffe were introduced to the area in 1947 on the assumption that they had become extinct historically (Goodman & Tomkinson 1987). Du Plessis (1969) asserted that giraffe had occurred in northeastern KwaZulu-Natal (Mozambique border). However, this was questioned by Goodman & Tomkinson (1987), who reviewed the evidence and concluded that

giraffe should be considered as 'alien' to 'Zululand' (i.e. KwaZulu-Natal) south of the Komati River. Introduced animal taxa can have a serious impact on the native flora and fauna. In the Ithala Game Reserve (northern KwaZulu-Natal) introduced giraffe have driven *Acacia davyi* to extinction, eliminated *A. caffra* within browse height and severely impacted *A. karoo* (Bond & Loffell 2001). Giraffe are also known to have serious impacts on vegetation in other habitats (e.g. Serengeti, Pellew 1983; Pellew 1984). Thus giraffe browsing is responsible for alteration of tree species abundance and distribution within savannas.

The classification of giraffe as 'alien' is of some importance to conservation managers since the brief of these managers is often interpreted as being the conservation of indigenous biodiversity. The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) prohibits the introduction of alien species into a habitat where it does not naturally occur (Bernard & Parker 2006). If giraffe are considered 'alien' then managers face the unenviable choice of either removing a charismatic tourist attraction from the reserve(s), or accepting that non-indigenous animals, with significant impacts on floral diversity and density, are protected in the reserves. The current classification of these animals as 'alien' to KwaZulu-Natal is therefore of some importance. The last review of the status of giraffe in KwaZulu-Natal was in 1987 (Goodman & Tomkinson 1987) and it is now appropriate to reconsider this issue in the light of new data.

The preferred habitat of giraffe is woodland on gently undulating terrain with year-round availability of browse (Rowe-Rowe 1991). The fact that giraffe currently flourish in parks within KwaZulu-Natal clearly indicates that the habitat is suitable for these herbivores. So what could have constrained giraffes from inhabiting KwaZulu-Natal? Giraffe generally avoid slopes with gradients greater than 1:3.6 (Bond & Loffell 2001) and thus may have been constrained from moving into hilly KwaZulu-Natal. However, there is a broad swathe of low-lying land extending from north of the Komati river (known giraffe range) well into KwaZulu-Natal. Goodman & Tomkinson (1987) suggested that rivers are possibly responsible

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since giraffe are effectively contained by water barriers. However, it is hard to believe that rivers would form an effective barrier to giraffe distribution over the long period of time since the Last Glacial Maximum (c. 18 000 years BP). There has been considerable fluctuation in temperature in the area (e.g. Mitchell 2002) and since the Last Glacial Maximum much of the vegetation and fauna of the area is likely to have been altered due to altered weather patterns (Lawes 1990), although the area itself was not glaciated. Over such extended periods of time it seems likely that droughts of sufficient duration would occur for rivers to dry up or for animals to find their way around these barriers. Since the influence of giraffe on tree abundance and mortality was so dramatic in Ithala (Bond & Loffell 2001) and the Serengeti (Pellew 1983), it seems likely that there would have been pressure for giraffe to explore all favourable habitats.

The argument that Goodman & Tomkinson (1987) advanced against the occurrence of giraffe in KwaZulu-Natal was largely based on the lack of reports of giraffe in hunting and naturalist literature. As these authors pointed out, giraffe were reported in the area (e.g. Sclater 1900; Ritter 1955), but these reports were not first-hand, or possibly indicated localities outside Natal. For instance, the detailed account of an elephant hunt with Shaka by Ritter (1955) which mentions giraffe (p. 188) sounds persuasive, but the book is apparently largely fictional (Wylie 1992). Nathaniel Isaacs (Herman 1936) mentioned (Vol. II, p. 266) that giraffe did occur east of Port Natal (Durban), but made no mention of actual sightings in his diary which documents an extended stay in the area between 1825 and 1832 with frequent diarized observations of elephant, lion, hyaena, antelope, buffalo, hippopotami, crocodiles, etc. Sclater (1900) reviewed the historical sightings of giraffe but listed none in Natal and stated only that giraffe were 'said' to occur in KwaZulu-Natal/Mozambique. From this and an extensive collection of other literature not mentioning giraffe in KwaZulu-Natal (e.g. Catherine Barter's account of a journey through 'Zululand', Merrett 1995, and the James Stuart Archive; John Wright, pers. comm.) it does seem unlikely that giraffe existed in KwaZulu-Natal at the time of the early colonial writings.

Although it may be argued that failure to report the presence of an animal is not proof that it did not occur (Bernard & Parker 2006), giraffe are somewhat obvious and remarkable, especially for

travellers unfamiliar with the animals. The lack of evidence for giraffe from early colonial literature does not necessarily mean that giraffe were not a component of the fauna prior to the colonial period. In Zulu, giraffe are given the name 'inDlulamithi' which literally means 'taller than trees' (Doke 1948). The use of a unique Zulu name for giraffe may provide evidence that giraffe were known to the Zulu-speaking people of the area. However, Gardiner (1836) stated that the people of 'Zululand' knew nothing of the 'camelopard', and it is possible that the Zulu name for giraffe was from animals encountered outside KwaZulu-Natal.

In place of written accounts, rock art may provide some indication of whether giraffe occurred in KwaZulu-Natal, although it is appreciated that the depiction (or not) of animals may not necessarily be indicative of whether (or not) they occurred in an area. The representations of animal species in rock art is likely to have been influenced by a range of factors, including their presence in particular areas, the esteem with which they were held by the people who produced the rock art, and how they were incorporated into their ritual practices. Rock art in KwaZulu-Natal comprises paintings by hunter-gatherers and engravings by Bantu-speaking agriculturists. Hunter-gatherer paintings are dominated by representations of humans and animals whereas agriculturist engravings are generally geometric in form and are believed to mostly represent homestead plans (Maggs & Ward 1995). The uKhahlamba-Drakensberg, in the west of the province, and southern KwaZulu-Natal areas have been extensively surveyed for paintings and neither area has yielded paintings of giraffe. The rock art of the central and northern parts of KwaZulu-Natal is poorly known; no paintings of giraffe have been recorded from these areas, although the possibility exists that they may still be found. Paintings of giraffe are known from other parts of northern South Africa (e.g. Limpopo Province).

Goodman & Tomkinson (1987) stated that the most convincing evidence for the occurrence of giraffe in the area would be its presence in archaeological remains. However, it needs to be borne in mind that the faunal content of archaeological deposits are influenced by human decisions as to whether or not to transport their kill to living sites. As a result the presence/absence of animal bones from archaeological deposits cannot be taken uncritically as evidence of past animal distributions and requires careful consideration. Further-

more, giraffe bones are generally not common in archaeological deposits; even in areas where the established natural ranges of the animals is not in doubt. This is probably because the size of the animals makes it difficult to transport more than small pieces (Plug & Badenhorst 2001). Archaeological sites in KwaZulu-Natal had not yielded giraffe remains at the time of the Goodman & Tomkinson (1987) publication; however, there are now reports of giraffe remains in archaeological sites, albeit in small quantities, and this raises the possibility that these animals occurred in the province.

Giraffe bones have been recovered from the Middle Stone Age deposits at Sibudu Shelter (Plug 2004; Wadley, pers. comm. 2007), the Holocene hunter-gatherer deposits at Maqonqo Shelter (Mazel 1996; Plug 1996), and from the Early Iron Age agriculturist site of KwaGandaganda (Plug & Badenhorst 2001; Whitelaw, pers. comm. 2007). Sibudu Cave, which is in the vicinity of Tongaat, 15 kilometres inland at an altitude of 100 m yielded one definite *Giraffa camelopardalis* in layer Cadbury (~50 ka) (NISP 1, MNI 1*), while a cf. *Giraffa camelopardalis* occurs in RSp (~50 ka) (NISP 1, MNI 1) and the uppermost of the ~60 ka layers, BSp (NISP 3, MNI 1) (Plug 2004; Wadley & Jacobs 2006; Wadley, pers. comm. 2007). Following Sibudu in age, a single possible giraffe bone has been identified from Layer 4 at the hunter-gatherer site of Maqonqo Shelter, in the KwaZulu-Natal midlands near Rorke's Drift, which is in a savanna/grassland area at an elevation of 1300 m (Mazel 1996). This layer has been dated to 4000–5000 years ago (Mazel 1996). Finally, four giraffe bones have been recovered from the Early Iron Age site of KwaGandaganda in the Mngeni Valley, about 30 km inland from Durban, which was occupied by agriculturists between about 1000 and 1400 years ago (Plug & Badenhorst 2001; Whitelaw 1994; Whitelaw, pers. comm. 2007). According to Whitelaw (pers. comm. 2007) the KwaGandaganda bones were recovered from Grid 2, which is an Ndongondwane-phase deposit dated to around 1300 years ago.

Discussing the presence of giraffe remains at these three sites, Plug (2004) indicates that it is unclear whether these remains 'represent the true distribution' of giraffe or whether they may perhaps be hunting trophies brought in from afar. She concludes that 'it is difficult to establish the status of this species and its distribution in the past' (Plug

2004). Her uncertainty is likely to have been partly informed by the absence of these animals in KwaZulu-Natal during colonial times, except perhaps in the far north of the province. However, of interest is that none of the recovered giraffe bones appear to have been modified (*e.g.* show evidence of wear or polish), which would usually indicate that they were used as a trophy or for ceremonial purposes. This increases the possibility that the bones are the product of subsistence remains and that the animals from which they were derived were more likely to have been present in the general area of the sites than to have been brought in from further afield.

Plug (2004) is nonetheless correct to highlight her doubts surrounding the presence of giraffe in KwaZulu-Natal from the available archaeological evidence. However, the occurrence of these bones is instructive and deserves further attention, particularly given the issue raised earlier about the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) prohibiting the introduction of alien species into a habitat where it does not naturally occur.

Focussing on the two more recent archaeological sites (*i.e.* Maqonqo and KwaGandaganda), both sites were important places at the time of their occupation and are therefore likely to have attracted unusual items. Some of these items originated from outside the province, such as ostrich eggshell at both sites and the copper artefacts at KwaGandaganda (Whitelaw 1994; Mazel 1996). It is possible that agriculturists acquired the ostrich eggshell from hunter-gatherers who had extensive networks which reached to the Harrismith plains, but that they obtained the copper through their own networks. While the giraffe bones may reflect the same situation as that of the ostrich eggshell and copper items (*i.e.* derived from outside the province), the possibility cannot be discounted that these animals lived in KwaZulu-Natal. According to Goodman & Tomkinson (1987) the most likely closest area for giraffe to KwaZulu-Natal was the Mpumalanga lowveld (at the confluence of the Mlumati and Komati rivers, 25.64°S, 31.79°E). The hunter-gatherer site of Maqonqo is in the north of KwaZulu-Natal and about 300 km south west of the Mpumalanga lowveld, while the agriculturist site of KwaGandaganda, which is in the south of the province, is about 450 km southwest from the Mpumalanga lowveld. It is unlikely that giraffe bones would have been brought in as 'hunting

*NISP = Number of Identified Specimens and MNI = Minimum Number of Individuals.

trophies' (Plug 2004) over such great distances and it is difficult to imagine what other reasons would have motivated Early Iron Age agriculturists to have moved four giraffe bones over such great distances. Another possible scenario is that giraffe are indigenous to KwaZulu-Natal and that (i) the occurrence of giraffe bones at Maqonqo and KwaGandaganda, and not in other sites occupied during the Holocene, reflects the importance of these archaeological sites in KwaZulu-Natal and (ii) that the paucity of giraffe bones in archaeological deposits in the province is consistent with the fact that giraffe bones are uncommon in archaeological sites even in areas where they were known historically (Plug & Badenhorst 2001). This possibility is strengthened by the fact that giraffe currently flourish in parks within KwaZulu-Natal.

Summing up the archaeological evidence, the possibility therefore exists that giraffe may have occurred in KwaZulu-Natal. However, the evidence at hand indicates that they were not common at the time of the first written accounts of the fauna of the area, if they were present at all. The giraffe is a rather conspicuous and intriguing animal, so it is unlikely that hunters or naturalists would have omitted to mention the occurrence of these animals. By the time of the first written reports, the area was extensively occupied by people who engaged in hunting and agriculture utilizing both domestic animals and plants (Herman 1936). It is possible that hunting and agriculture may have displaced these animals from their native habitat. A giraffe is a rather obvious animal and therefore might have been relatively easy to extirpate from the region. There is continuing debate as to whether humans, climate or disease may have caused the extinction of large vertebrates in the Late Pleistocene. However, large vertebrates are particularly vulnerable to human predation (Owen-Smith 1987; 1989). Brook & Bowman (2004) have referred to the extinction in the late Pleistocene of large vertebrates as a 'blitzkrieg' of the 'megafauna' driven by human colonization.

Giraffe may thus have occurred in KwaZulu-Natal and their demise was linked to 1) direct or knock-on effects of human activities; 2) climate change (e.g. Mitchell 2002); 3) disease, as suggested by Goodman & Tomkinson (1987). If giraffe were indigenous to KwaZulu-Natal it is uncertain as to whether they were present between 1000 BP (date of most recent excavation evidencing giraffe remains), and c. 220 BP (date of written accounts). Localized extinction of large browsing

species in many African ecosystems may have severely altered the distribution of tree species (e.g. Bond *et al.* 2001). The fact that recently (re-)introduced populations of giraffe have severely impacted the current distribution of some tree species (Bond & Loffell 2001), albeit in fenced reserves, could mean that those tree species were severely constrained in the past by giraffe. The tree distributions that we see in some areas of KwaZulu-Natal today could thus be, to some degree, an artefact of giraffe extirpation.

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