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Short Communication

The correct name of the South-central black rhinoceros is *Diceros bicornis keitloa* (A. Smith, 1836)

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In South Africa, the black rhinoceros (*Diceros bicornis*) is divided into two subspecies, the South-western in the west and the South-central in the east. The exact boundary between the ranges of these subspecies is uncertain, but has been defined to coincide with the administrative border between the Northern Cape and North West provinces. It is current practice to refer to the South-central black rhinoceros as *Diceros bicornis minor*, which has Zululand as the type-locality. This needs adjustment, because an earlier valid scientific name was given to a rhinoceros killed near Zeerust in the western part of North West province. In line with the rules of zoological nomenclature, the South-central black rhinoceros should be known as *Diceros bicornis keitloa*.

Keywords: distribution, nomenclature, sympatry, taxonomy

Taxonomists working on the classification of the black rhinoceros *Diceros bicornis* (Linnaeus, 1758) have consistently agreed that the populations close to the Cape of Good Hope differ enough from those in Zululand to be separated as subspecies. This is remarkable, because the details of the subspecific splitting of the species remain fluid and far from settled, with major differences in the few relevant works by Hopwood (1939), Zukowsky (1965), Groves (1967), Meester et al. (1986), Hillman-Smith and Groves (1994), Emslie and Brooks (1999) and Groves and Grubb (2011). There is even agreement that the classification of the species requires further study taking into account all existing and extinct populations across the African continent (Hillman-Smith and Groves 1994; Rookmaaker 1995, 2005, 2011; Emslie and Adcock 2013). The black rhinoceros is in imminent danger of extinction with rates of poaching soaring to unprecedented levels, requiring policy decisions that must be practical and effective. They must also reflect the prevailing taxonomy and nomenclature (Rookmaaker 2015). For pragmatic reasons, the black rhinoceros of the North-West province (NWP) is now regarded as identical to the Zululand subspecies (Knight et al. 2013). As will be shown here, this requires a change in the name of the subspecies because *Rhinoceros keitloa* was described from western NWP by Andrew Smith (1836).

In the 'western range', the black rhinoceros was once found in the Western Cape, Northern Cape and Eastern Cape (Rookmaaker 1989, 2008; Skead et al. 2007). The animal has not been recorded east of the Great Kei River (Boshoff et al. 2016). It is likely that the rhinoceros disappeared from the Western Cape around 1800, and from the Eastern Cape around 1870 (Rookmaaker 2008; Skead et al. 2007, 2011). The black rhinoceros was

certainly extinct in this western range before the end of the nineteenth century, which was expressed in the title of a paper by Rookmaaker and Groves (1978). This historical fact has been challenged, but all arguments hinge on an assessment of how far this western variety ranged northwards, which should be the subject of a future study. The *Rhinoceros bicornis* of Linnaeus (1758) is correctly taken to denote the black rhinoceros of the Cape of Good Hope, and this is the typical subspecies now known as *Diceros bicornis bicornis* (Linnaeus, 1758). As a vernacular name, Emslie and Brooks (1999) suggest South-western black rhinoceros.

In the 'eastern range', the rhinoceros was found in the northern part of KwaZulu-Natal and in Mpumalanga, Gauteng, Limpopo and NWP. Remarkably, no rhinoceros was ever reported south of the Thukela (Tugela) River, which leads to the conclusion that it never occurred there (Rookmaaker 2008). In an era when rhinos were classified according to horn shapes and lengths irrespective of locality, the Scottish naturalist William Henry Drummond (1876) distinguished three taxa in this region, possibly partially sympatric, as *Rhinoceros bicornis minor*, *Rhinoceros bicornis major* and *Rhinoceros keitloa*. Following Zukowsky (1965) as first reviser, the current name of the rhinoceros in the eastern range is *Diceros bicornis minor* (Drummond, 1876). As a vernacular name, Emslie and Brooks (1999) suggest South-central black rhinoceros. The distribution of this subspecies extends northwards through Swaziland, Mozambique, Zimbabwe, Zambia, Malawi and parts of Tanzania.

Following Groves (1967), the South-central black rhinoceros is characterised by a short, compact body, well-marked skin folds and large head. On a subspecific

level, *D. b. bicornis* is larger than *D. b. minor* as shown in measurements such as greatest skull length (667.0 ± 37.7 vs 575.2 ± 8.1 mm) and zygomatic breadth (372.5 ± 13.4 vs 330.4 ± 8.5 mm).

Recent thorough research of historical distribution records in South Africa show that there is a large region stretching from the Great Kei River in the Eastern Cape to the Thukela River in KwaZulu-Natal where the rhinoceros has not been reported and most likely never occurred (Skead 1987; Skead et al. 2007: 493; Rookmaaker 2008; Rookmaaker and Antoine 2012). In addition, the rhinoceros is absent from most of the Free State and Lesotho (Rookmaaker 2008; Boshoff and Kerley 2013). The existence of this 'Transkei gap' has led to a reassessment in the proposed extent of the distribution of *D. b. bicornis* in the Eastern Cape (Emslie and Adcock 2013; Knight et al. 2013).

Andrew Smith (1797–1872) was a Scottish army surgeon who studied the diversity of South African wildlife during his stay in the country (1821–1836), discovering hundreds of new species of vertebrates (Rookmaaker 2016). As leader of the 'Expedition for Exploring Central Africa' (August 1834 to January 1836), he reached areas close to the Limpopo River in NWP. Travelling along the Molopo River, he halted on 31 May 1835 at a spring called Merimani and then continued towards Mosegha. On the afternoon of Monday 1 June 1835 a rhinoceros was killed, very close to the current town of Zeerust – 50 km north-east of Mahikeng and 80 km west of Pilanesberg National Park. When Smith examined the animal, he noticed special characters such as a bluish-green colour and a prominent posterior horn almost equal in size to the anterior one (Rookmaaker 2008: 89). The remains were taken to Cape Town, where Smith described a new species named *Rhinoceros Keitloa* (Smith 1836: 44). Consequently, the specimen was shown at the Egyptian Hall in London, and auctioned on 7 June 1838 when it was acquired by the British Museum. The new species figured prominently on the first plate of Smith's magnum opus, the *Illustrations of the Zoology of South Africa* (Smith 1838).

The keitloa-type of rhinoceros with two equal horns featured regularly in nineteenth-century literature. The description by Andrew Smith had given scientific standing to the unfortunate classification of African rhinoceroses based on horn shapes. This came to such a complicated state, as witnessed in Drummond (1876), that it became untenable in museum taxonomy, even though popular around campfires. The type-specimen of *Rhinoceros keitloa* is preserved in the Natural History Museum (1838.6.9.101). Hopwood (1939) figured it as a skull with horns, and gives measurements including occipito-nasal length 645 mm and zygomatic width 357 mm.

The type-locality of *Rhinoceros keitloa*, known with great accuracy, is a place near Zeerust (NWP) with coordinates $25^{\circ}47'$ S, $26^{\circ}03'$ E. It is important to establish if this locality is within the range of *D. b. bicornis* or of *D. b. minor*. In mammalogy, a subspecies is a group of populations inhabiting a geographical subdivision of the range of the species and differing from other populations by diagnostic morphological characters. If one subspecies was sympatric with another subspecies, their identities would soon be lost by interbreeding, hence they are allopatric by definition,

even though intergrades may exist. Wherever the border between the two rhino subspecies might have been, it is unlikely to be a definite well-defined line (Emslie and Adcock 2013).

As the rhinoceros has been extinct in NWP since around 1850, the historical record of its exact distribution will always remain inadequate. Therefore different interpretations may be expected. The map of subspecific ranges in Zukowsky (1965) shows *D. b. bicornis* in the western range and *D. b. keitloa* combined with *D. b. minor* in the eastern range. In a paper by Groves (1967) to counter Zukowsky's excessive splitting, the type specimen of *Rhinoceros keitloa* was found to be smaller than *D. b. bicornis* but considerably larger than *D. b. minor* of Zululand, and therefore "would seem to make a good intermediate." In this classification, which was largely followed by subsequent taxonomists, *R. keitloa* is a synonym of *D. b. bicornis*, and consequently the border between the subspecies should be east of Zeerust.

In an early South African management plan, Hall-Martin and Knight (1994) do not define the ranges of the two subspecies, but their map shows a boundary in western NWP roughly coinciding with the 500 mm rainfall isohyet. According to Emslie and Adcock (2013) and Knight et al. (2013), this was reappraised to coincide with the 400 mm rainfall isohyet. This was further revised to give more prominence to the existence of the 'Transkei gap' (Emslie and Adcock 2013). For the northern regions this meant that the border was a vertical line on a map roughly through the longitude of Kuruman or about $23^{\circ}50'$ E, well to the west of Zeerust. This position is clearly formulated in the latest action plan by Knight et al. (2013), repeated by Emslie and Adcock (2013), stating that the Northern, Western and Eastern Cape are allocated to *D. b. bicornis*, while *D. b. minor* inhabits KwaZulu-Natal, Gauteng, Mpumalanga, Limpopo, NWP and Free State, partly based on practical management reasons.

Nomenclature reflects the classification proposed by taxonomists, who have agreed to follow rules to ensure that each taxon is identified by one unique and stable name. It is governed by the International Commission on Zoological Nomenclature, which edits a Code, now in its fourth edition (ICZN 1999). The name of each subspecies must be the oldest available (properly published) name given to specimens within that subspecific range. When we follow the classification in the works by Groves, the correct name for the South-central black rhinoceros is *Diceros bicornis minor*, because the type-locality of *Rhinoceros keitloa* lies westwards of its range. When we follow the action plan as expressed by Knight et al. (2013), the correct name for this subspecies must be *Diceros bicornis keitloa*, because the whole of NWP is included in its range.

It could be said that *D. b. minor* has been in prevailing use for a long time and therefore has established itself as the correct name. Similarly, it could be advanced that *keitloa* is a forgotten name (*nomen oblitum*), which is a term defined in the International Code of Zoological Nomenclature (ICZN 1999) as a name older than one in prevailing use and not used since 1899. According to Article 23.9.1, prevailing usage can be (must be) maintained when a senior synonym or homonym has not

been used since 1899 and if the junior name has been used regularly. Strictly following this rule, *keitloa* is not a forgotten name because it was used as a valid name at least by Zukowsky (1965).

The conclusion is clear. As it has now been established for pragmatic purposes that the range of the South-central black rhinoceros in South Africa continues westwards of longitude 26° E, the subspecies must be known as *Diceros bicornis keitloa* (A. Smith, 1836).

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