GENUS *Diceros*

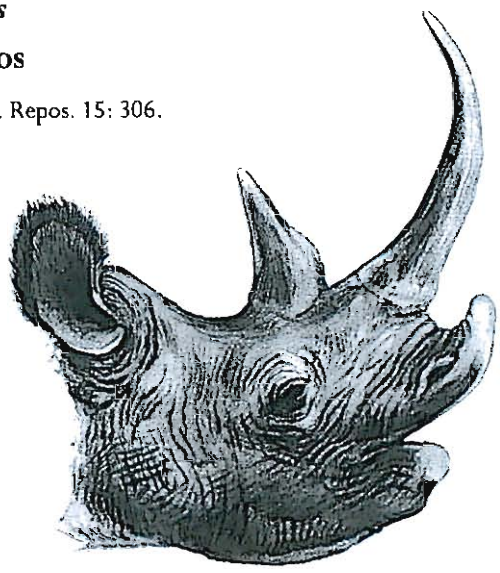
Black Rhinoceros

Diceros J. E. Gray, 1821. London Med. Repos. 15: 306.

Diceros is a polytypic genus, represented by a single extant species, the Black Rhinoceros *Diceros bicornis*. This species once was widespread in sub-Saharan Africa, from the Niger R. in the west to Somalia in the north-east, and southwards to South Africa. It was never found in the Congolese rainforests. The animal exists in a large variety of habitats, including savanna, bushveld and dry thornbush, from sea-level to high mountain forests.

The members of *Diceros*, like the other extant African rhinoceros genus *Ceratotherium*, bear two nasal horns. *Diceros* is distinguished from *Ceratotherium* by the shorter skull, pointed upper lip, swayed back, and generally smaller size (Guggisberg 1966, Hillman Smith & Groves 1994, Joubert 1996). The extinct rhino from the regions around the Cape of Good Hope was larger than other populations (Rookmaaker & Groves 1978). Inter-specific hybridization has occurred between a female *Ceratotherium simum simum* and a male *Diceros bicornis* kept in an 800 ha enclosure of South Africa's National Zoological Gardens Game Breeding Centre (Robinson *et al.* 2005).

Fossil remains of species referable to *Diceros* have been found in many parts of Africa. *Diceros douariensis* was found in the Mio-Pliocene of Tunisia (Guérin 1966) and *Diceros australis* in deposits of the middle Miocene of Namibia (Guérin 2000). In East Africa, the genus was represented by *Diceros praecox* in the early to late Pliocene (Geraads 2005), although previously some of the remains had been classified under *Ceratotherium* (Hooijer & Patterson 1972). *Diceros bicornis* first appears at the 4 mya level in Pliocene deposits in Kenya and Ethiopia, and at 2.5 mya the molar crowns became as high as in the recent specimens (Hooijer 1978, Prothero *et al.* 1986).



Black Rhinoceros *Diceros bicornis*.

Kees Rookmaaker

Diceros bicornis Black Rhinoceros (Browse Rhinoceros, Hook-lipped Rhinoceros)

Fr. Rhinoceros noir; Ger. Spitzmaul-Nashorn

Diceros bicornis (Linnaeus, 1758). Syst. Nat., 10th edn, 1: 56. 'Habitat in India', but Cape of Good Hope, fide Thomas (1911).

Taxonomy Groves (1967) reviewed earlier classifications and reduced the number of subspecies recognized based on cranial dimensions and other characters to seven in different regions of Africa. This classification has since been questioned, as it was based on small sample sizes (du Toit 1986), and was not supported by a preliminary analysis of data from more skulls (du Toit 1987). A proposal from a 1986 African Rhino Workshop in Cincinnati was adopted by the first IUCN African Elephant and Rhino Action Plan (Cumming *et al.* 1990) resulting in the recognition of four Black Rhino ecotypes or 'subspecies' conservation units (Cumming *et al.* 1990). The IUCN Species Survival Commission's African Rhino Specialist Group recognized these four subspecies conservation units in different areas (Emslie & Brooks 1999) although only three survive: Southern-central (*Diceros bicornis minor*); South-western (*D. b. bicornis*); and Eastern (*D. b. michaeli*); the Western (*D. b. longipes*) was recently declared extinct.

Historically, the boundaries between these subspecies were not 'hard-edged', in contrast to the markedly discontinuous range of the two White Rhinoceros *Ceratotherium simum* subspecies. However, there are major differences in the habitat and climates in the core areas of the three remaining subspecies, and it is likely that each has specific genetic or behavioural adaptations to the environment. While some conservationists have preferred to refer to the Black Rhino subspecies as ecotypes due to their contiguous distribution and perceived limited genetic differences between them, genetic analyses indicate that the Southern-central, South-western and Eastern Black Rhino are sufficiently distinct to support the current subspecies distinction (Harley *et al.* 2005). The more discontinuous distribution of the recently extinct Western Black Rhino, and the single genetic sample analysed to date, support its classification as a separate subspecies (Harley *et al.* 2005). Genetic variation in mitochondrial DNA of *D. b. minor* (from Zimbabwe animals) and *D. b. michaeli* (from East Africa) revealed that these two subspecies represent separate ancestral lineages, which diverged between 0.93 and 1.3 million years (Brown & Houlden 2000). These genetic studies support recognition of four subspecies, although K. Rookmaaker (pers. comm.) notes they too were also based on small sample sizes and ignored many populations.

Controversy surrounds the formal subspecies nomenclature. *Diceros b. bicornis* has been described as being restricted to the Western Cape and further north, at least to middle Namibia, and is believed to have gone extinct (Ansell 1974, Rookmaaker & Groves 1978) leading to a questioning of the use of the subspecies name *D. b. bicornis* to refer to the animals derived from the surviving arid-adapted animals from N Namibia (Hopwood 1939, Groves 1967, Rookmaaker 2005b, P. Lloyd pers. comm.). However, this view has been challenged. It has been argued that the animals from N Namibia can be amalgamated with those in the Western Cape and