

TAXONOMY OF UNGULATES OF THE INDIAN SUBCONTINENT

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The ungulates of the Indian Subcontinent are remarkably diverse taxonomically and, despite their conspicuous nature, much remains to be learned about them. Their diversity appears to have been considerably underestimated, at both specific and subspecific level. Here, I argue that in historic times the Subcontinent has been home to 46 ungulate species. Three of these species (*Equus hemionus*, *Rhinoceros sondaicus* and *Bos javanicus*) are probably extinct. Six taxa, commonly regarded as subspecies of other species, I here raise to specific rank, or have done so very recently elsewhere: *Equus khur*, *Moschus cupreus*, *Muntiacus vaginalis*, *Cervus wallichii*, *Cervus hanglu* and *Capricornis thar*. Twenty-four species are polytypic; of these, eight are more widespread species represented by a single Subcontinental subspecies, but the remaining 16 show subspecific diversity within the Subcontinent itself. I describe one new subspecies, *Gazella bennettii salinarum*, and recognise three subspecies (for which names already exist) in *Tetracerus quadricornis*, a species previously thought to be monotypic.

INTRODUCTION

Over the hundred plus years of its existence, the Bombay Natural History Society has seen vast changes in its political and social setting, its clientele and its very rationale for existence. It has survived the demise of shikar and of British India, the dismembering of the polity that nurtured it, and even the change of name of the city that forms its base. In the meantime, the *Journal* of the BNHS has progressed from being a vehicle for documenting the fauna and flora of the Indian Subcontinent to its present status as the premier voice for knowledge, understanding and conservation of the Subcontinent's wildlife, both nationally and internationally.

In the midst of all these changes, we should not assume that the Society's original mission, that of documenting the fauna and flora of the Subcontinent, is complete. There is much to be learned, as I hope to show, about even the largest species of fauna, the ungulates. Again,

while the original three countries of the Subcontinent (India, Nepal and Bhutan) have become divided into six, with the creation first of Pakistan and Sri Lanka and later of Bangladesh, these six countries share a common wildlife heritage, and I treat them together here.

The object of this centennial contribution, then, is to gather together information on the taxonomy of the ungulates of the Subcontinent, and to try to document exactly what it is that we know or do not know about this small but important corner of its biodiversity.

TAXONOMY

Taxonomy, the science of biological classification, is still undergoing a wide-ranging rethink of its basic premises. A classification is an "information retrieval system", but exactly what information is it that we want to retrieve? Most practising taxonomists today would say that they want to try and incorporate information about evolution into their classifications, because this allows us to make predictions: if certain taxa share a common ancestor, their behaviours, their ecology and other aspects of their biology will be

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whitish; demarcation on the lower haunch slants upward from front (stifle) to back. Dorsal stripe with a clear white border on either side; this becomes obfuscated with age, but probably never entirely disappears. White wedge between haunch- and flank-blocks nearly or fully reaches spine. Legs pure white. White zone on muzzle occupies nearly 40% of snout-to-ear distance. Dorsal stripe fades out halfway down tail. No dark ring round hoof. Nasal bones raised (making whole facial profile strongly concave); skull short [length, male 493-519 mm (n=3), female 468-511 mm (n=6)], with small teeth, noticeably high-crowned. Choanae small. Orbits high. Metapodials less elongated than *E. hemionus*. Ear very long, 187-210 mm.

The khur still occurs in the Little Rann of Kutch. I have seen a specimen from Thar Parkur, Sind, where it is now extinct.

FAMILY RHINOCEROTIDAE

Genus *Rhinoceros* Linnaeus, 1758

Rhinoceros unicornis Linnaeus, 1758. Indian/ Great one-horned rhinoceros

1758 *Rhinoceros unicornis* Linnaeus, 1758. Rookmaaker (1998) shows that this name was based on the same specimen from which Albrecht Dürer's famous woodcut was taken. He suggests restricting the type locality to Assam.

1817 *Rhinoceros indicus* G. Cuvier.

1830 *Rhinoceros asiaticus* Blumenbach.

1867 *Rhinoceros stenocephalus* Gray. Asia.

1876 *Rhinoceros jamrachi* Sclater. Manipur. Contra Rookmaaker (1983), I would consider that the original description, that of Jamrach (1874), does not truly count as a "publication."

The historical distribution of this species extended from the upper Brahmaputra, on (and beyond) the Burmese border, along the Ganga-Brahmaputra system to the Indus and its

tributaries, as far west as the Khyber Pass (Rookmaaker 1980, Rookmaaker 2000).

In the multivariate analysis of Groves (1993a), Nepalese and Assamese skulls are different. Those from Assam tend to have narrower zygomatic breadth but wider occiput and interorbital region. A single skull from Koch Bihar was more similar to those from Nepal. These findings should be tested on larger samples.

Rhinoceros sondaicus Desmarest, 1822. Javan/ Lesser one-horned rhinoceros

Rhinoceros sondaicus inermis (Lesson, 1840)

1840 *Rhinoceros inermis* Lesson. Sunderbans.

Broad across the zygomatic arches, and high occiput (Groves and Chakraborty 1983, Groves 1993a). The subspecies from the Sunderbans and neighbouring districts (including the Sylhet and Chittagong districts of Bangladesh, and Manipur, possibly also Bhutan and Sikkim: see Rookmaaker 1980) became extinct in the 1890s.

A skull from Moraghat, Bhutan Duars (where the species has been extinct since the 1870s), differs slightly from Sunderbans specimens, especially in its large teeth (Groves 1967).

Genus *Dicerorhinus* Gloger, 1841

Dicerorhinus sumatrensis (G. Fischer, 1814). Sumatran/Asian two-horned rhinoceros

Dicerorhinus sumatrensis lasiotis (Sclater, 1872)

1872 *Rhinoceros lasiotis* Sclater. Chittagong.

A large subspecies with large teeth and very broad, high occiput; molar teeth are large (Groves and Chakraborty 1983, Groves 1993a). Formerly occurred in the northeastern states of India and eastern Bangladesh, as far west as the Sankosh river, and North Cachar, Cachar and Hailakandi districts in Assam; it apparently still occurs in Manipur and Nagaland (Choudhury 1997).

Nemorhaedus goral (Hardwicke, 1825). Himalayan goral

Nemorhaedus goral goral (Hardwicke, 1825). Brown goral

1825 *Antilope goral* Hardwicke. Kathmandu.

1827 *Antilope duvaucelii* Hamilton Smith, 1827.

1908 *Naemorhedus hodgsoni* Pocock. Sikkim.

From Bhutan west to about Nainital.

Medium brown with black hair tips, giving a hare-like effect; or slightly greyer, to grey-brown; or pale or dark fawn; legs browner, to very bright tan, or white on forelegs only. Underside paler grey. Throat and chin variably white, may be interrupted under jaw; lips white. Dorsal stripe usually weak, may fade behind withers.

Nemorhaedus goral bedfordi (Lydekker, 1905). Grey goral

1905 *Urotragus bedfordi* Lydekker. Dharmsala.

From Chamba and Kulu, west into Kashmir.

Grey to grey-brown to yellow-grey; legs lighter, yellower, with dark brown line down front, fading on pasterns. Underside off-white. Throat and chin creamy the whole way. Merest trace (if that) of dorsal stripe.

Genus *Budorcas* Hodgson, 1850

Takin of India and Bhutan differ from those of China in their smaller horns and in the brown rather than golden colour, except for a lighter, yellow-toned saddle. They become blacker with age, this colour developing earliest on the underside, haunches and limbs.

Budorcas taxicolor Hodgson, 1850. Takin

Budorcas taxicolor taxicolor Hodgson, 1850

1850 *Budorcas taxicolor* Hodgson. Mishmi Hills.

Known from the Mishmi Hills (extending into Chinese and Burmese territory). Males much larger than females (biorbital breadth over 190 mm in males, less than 176 in females); teeth relatively small, maxillary tooththrow length 114-122 mm; horns of males very large, their span 341-411 mm.

Budorcas taxicolor whitei Lydekker, 1907

1907 *Budorcas taxicolor whitei* Lydekker. Bhutan.

From Sikkim and Bhutan. Males as small as females (biorbital breadth 166-182 mm in both sexes); maxillary tooththrow length 120-124 mm; horns of males smaller, their span 297-357 mm.

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