Phylogeny of Cattle and buffaloes

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The animal kingdom is having phylum chordata, and the subphylum vertibrata that encompasses all the vertebrate animals. Their class is mamalia. It is sub divided into orders and cattle and buffalo belong to the order artiodactyla or even toed ungu lates. The order is having existence of around 50-60 million years. The suborder is ruminantia. The most distinctive character of ruminants is their special digestive system, with rumi nation enabling an efficient utilization of grass and leaves as food.

Next sub grouping is as family bovidea. The cattle and buffaloes belong to the family bovidae. Bovidae are distinguished by the presence of permanent hollow horns. They are believed to have emerged about 20 million years back. The family is again divided into subfamilies and cattle and buffaloes are classified under the subfamily of bovinae that include eland (spiral horned antelope) and nilgai (four horned antelope) also. The tribe bovini, which include buffaloes and cattle, is the larger sized animals of the bovinae sub family. The divergence of them is estimated to have taken place around 4 million years ago.

Scientists further divide the tribe bovini into Bovina, Syncerina and Bubalina and again buffalo and non-buffalo. In bovina there are two subgenera bison and bos. Bos is again split into Poephagus (Yak), Bos (Taurine and zebu cattle) and Bibos (Banteng, Kouprey and Gaur). Bison is having two species American bison (*Bison bison*)and European bison or Wisent (*Bison bonasus*). Syncerina is having two different species *Syncerus caffer caffer* and *Syncerus caffer nanus*.(African and Congo buffaloes respectively). Bubalina is having three species *Bubalus bubalus* (water buffalo), *Bubalus mindorensis* (Tamarao) and B*ubalus depressicornis* (Anoa).

American Bison

American bison is commonly known as Bison. American buffalo is the misnaming used for this species. They do not have many similarities with buffaloes. Unlike the buffaloes bison has a large head, neck and humped shoulders. It has 14 pairs of ribs, instead of 13 pairs found in buffaloes. The scientific name of bison is *Bison bison*. The extensive hunting lead to drastic reduction in their number and it is estimated that in 1894 there were only 800 animals of the species alive. Estimated modern population is around 25,000 in national parks of USA. There are another 15000 animals reared as source of meat. Another species of bison namely *Bison bison athabasca* is also available in woodlands.

The American bison is brownish-black, except on the hind part of the body, which is brown. Long, coarse hair covers the head, neck, and hump. The hair forms a beard on the throat and chin. The head has a pair of horns like those of domestic cattle. Some of the horns spread as much as 90 centimeters at their widest point. A full-grown bull measures from 3 to 3.8 meters long,

from the tip of his nose to the end of its short, tufted tail. Bulls usually weigh from 700 to 900 kilograms. Extremely large ones may weigh around 1400 kilograms. Cows are much smaller than bulls and rarely weigh more than 400 kilograms.

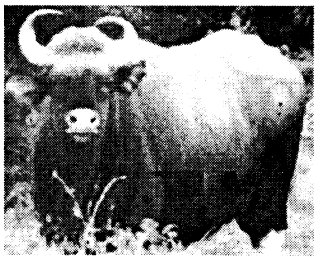
Wisent

European bison is otherwise called wisent. The scientific name is *Bison bonasus*. The head of wisent is smaller and carried higher than that of American bison. The species was on the verge of extinction. Due to the intensive conservation efforts and planned breeding, their number was raised to 3332 in 1990 in Belarus, Lithuania, Poland, Russia, and Ukraine. All of them are maintained in zoos or zoological parks.

Cattle

Cattle belong to the genus Bos. Two separate species are identified in cattle namely *Bos indicus*, the zebu and the *Bos Taurus* the European cattle. There are more than 800 recognised breeds of cattle in the world. The major difference between these two groups is their physical appearance. The prominent hump, pendulous dewlap, presence of naval flap and smaller size are the important characters of zebu cattle. The acrocentric Y-chromosomes of *Bos indicus* cattle compared with the submetacentric Y chromosomes of *Bos taurus* cattle is another distinguishing feature.

Gaur



Indian bison is otherwise called gaur (*Bibos gaurus*). These animals are limited to Indian forests, Indochina and Malay Peninsula. They have the typical sexual dimorphis.

Mithun

Other wise referred as the mountain cattle or the ceremonial ox of India, the species is believed to be the domesticated gaur. Gayal is another term used for the species. Mithun is found in North Eastern states of India namely Arunachal Pradesh, Mizoram, Nagaland, Sikkim and Manipur. They are also present in Myanmar and Bangladesh. A small population is also available in China. All type of body colour and unfailingly white stockings below the knee is the common feature of Mithun. The diploid chromosome number is reported to be 58. The tribal people as pecuniary measure in barter trades, marriage gifts, and tribute or fine mainly use Mithun. The normal bridal money is said to be 3-10 Mithuns in some of the tribes of northeast. In most of the tribal marriages of the North Eastern states, the exhibited numbers of slaughtered mithun heads depict the social standing and financial status of the individual. Another feature of the species is that it is a browser like goat and can survive in any type of green forage. The water requirement of Mithun is estimated to be high and hence it is usually found near the water sources. The animals are fond of salt and this is considered to be the only bondage between the owner and animals. This may be the factor that made the domestication of the species possible. Cross breeding with cattle is undertaken by different agencies and the crosses are said to have good working potential and milk production. But the reports regarding their fertility are contradictory.

Two definite breeds are recognised in mithun. Naganese is the beef breed with larger body weight. The colour of the animal is black. Arunachalee is the beef and milk animals with short and stout body. Body weight is around 300 kg. The animals are with white patches on body and piebalds are common.

Yak

One of the evolutionary theories of cattle and related species is that the ancestors of cattle (*Bos pronigieins*), urus and yak derived from a common ancestor in Africa in Pliocene age. The home tract of Yak is between altitude of 3000 meters to 6000 meters above sea level. They are present in Russia, China, Mangolia, India, Nepal, Bhutan and the former Soviet Union countries. In India they are seen in Arunachal Pradesh, Sikkim, Himachal Pradesh and Jammu and Kashmir. The wild variety is known as *Phophagus mutus* and the domestic variety *Phophagus grunniens*. The name itself shows the character difference between the two as the wild variety is mostly silent except

during breeding season where as the domestic variety is known for its grunt. Yak is kept for milk, wool and work. Its meat is also used. They can carry loads of 60-70 kg for 12 hours a day and are hence called the ship of high hills. Crossbreeding is also practiced in domestic yaks, in China with recognized *B.taurus* breeds and in India with nondescript cattle. The cross breds are good milk producers in F1 and F2 generations. Female cross breds reproduce normally where as males though normal in sexual behavior are sterile..

Kouprey

The Compodian wild ox is known as Kouprey. The scientific name is *Bibos sauveli.* Vietnam and Campodia houses around three hundred animals in their forests. In 1988 the total population was roughly estimated at 100 - 300, composed of 30 in Vietnam, 40 - 100 in Laos, fewer than 200 in Cambodia, and small numbers in Thailand (MacKinnon and Stuart 1989). They are found along with Banteng herds in open parts of jungle. Adult animals weigh between 650 to 900 kg. It is usually found in herds of around 20. The mother and calf keep away from the herd for one month. The kouprey is diurnal, grazing in open areas during the day, and entering the forest for shelter from the sun, for refuge from predators, and to seek food when the grasslands are dry. It is both a grazer and a browser. The major reason for the kouprey's decline has been uncontrolled hunting by local inhabitants and by the military, especially during the three-decades-long series of wars and insurgencies in Indochina. Other factors include disease transmitted from domestic stock and loss of habitat due to illegal logging and slash-and-burn agriculture has a naturally low reproductive rate; and now occurs only in scattered remnant populations that may suffer from inbreeding.

Banteng

Colour is bluish black with white stockings and with white rump patch. *Bibos javanius* is the species of animals found in South East Asia, Java and Kalimantan. They are very shy with a sexual dimorphism. It is believed to be the wild progenitor of Bali cattle.

Though the wild banteng numbers around 2000 in wild, the domestic Bali cattle amounts to 1.5 to 2 million heads. They are kept as work animals and also for meat.

Arnee

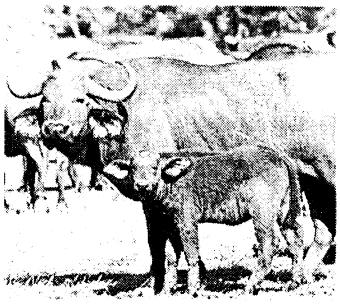
Arnee is the Indian wild buffalo and is assumed to be the wild progenitor of domestic buffalo. They are seen in the forests of Assam, Nepal and Burma. A small herd is identified in Madhya Pradesh. These animals are found in large herds. In Assam the Arnee is found in forests. They are said to breed the local buffaloes found in "Kutties". Kutties are the islands in river Brahmaputra. In summer these islands are connected to the main land and the forest buffaloes get a chance to mate with the domestic buffaloes. But scientific proof still awaited.The physical appearance of the wild buffaloes is different from those of buffaloes in Kutties. The arnee are huge animals and may weight around 700 kilograms or more. They have very large horns found on top of the poll, curving outward, inward and almost completing a circle. The horn shape and size is said to be sufficient to identify individual animals.

Water Buffalo

The domesticated buffaloes are known as water buffaloes. There are two different types namely swamp and river type. The former is mainly used for work and are having a diploid chromosome number of 48 and the later is having 50 chromosomes. The river type buffaloes prefer clear water for wallowing and are generally milk animals. Almost all the recognized Indian breeds are river types.

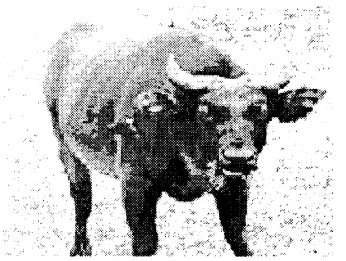
African buffalo

The scientific name of the species is *Syncerus caffer caffer*. They are one of the most dangerous game animals. They are heavy and lives on the African savannah south of Sahara. The full-grown adults may have a height of around 2 meters and weight of 750-800 kg. Although it can be tamed it is never domesticated. The chromosome number is 52. Colour of the animal is dark grey or black. The horns are heavy ridged, grow straight out from the head, curved downward and then up. Herd size may range from few hundreds to thousands. Most of the animals are females and calves. Males may form bachelor herds. Adult males prefer to stay alone or as small groups. The life span of the animal is estimated to be 10-20 years.



Congo buffalo

Other wise known as the forest buffaloes which are seen in Central and West Africa. The Congo buffaloes are smaller animals compa- red to African or cape buffaloes and adults weigh around 300-350 kg. The height of these animals are below four feet. The horns are 30-40 cm long curving backward with large base. The adult males may have upto 1.3 meter height. Congo buffalo or red buffaloes is having copper colour. The species name is *Syncerus caffer nanus*. The natural herd comprises around 10-12 animals of which one or two will be males and the others females and their offspring. Occasional bachelor herds are also seen. The diploid chromosome number of this species is reported to be 54.



Anoa

The smallest of the bovine species is having the size of a medium sized goat. It is seen in forests of Sulawesi, Indonesia. Two different types of the species namely mountain anoa (*Bubalus quarlesi*) and low land anoa are identified.

Tamaraw

Tamaraw is bigger than anoa but are smaller than other bovines. They are found in southern Philippine Island and Mindoro. The height of these animals are around 107 centimeters.It is a wild animal and is black in colour. It feeds mainly on grasses of various species. It is a solitary creature except during the breeding season, April to July. Destruction of habitat due to deforestation and hunting contributed to its decline. From 10,000 head in the 1900's, the Tamaraw population is now reduced to 350-400.

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"A country rich in livestock is never poor and country poor in livestock is never rich"

Arabian proverb