

# Migratory processes and habits of wildebeest and zebra on the Serengeti savannah of east Africa

**Jingyao Huan**

Beijing Royal School, Beijing, China

huanjingyao@st.brs.edu.cn

**Abstract.** Every year during the June migration season, many animals in the Serengeti Savannah of East Africa begin to migrate southward. Whenever the climate alternates between wet and dry, herds of hornbills and zebras make a spectacular migration from the Serengeti Savanna in Tanzania northwest to the Masai Mara Savanna in Kenya. This paper looks at the genetic differences between zebras and antelopes from a biological perspective. This study is about the migratory habits and processes of hornbills and zebras in the Serengeti Savanna of East Africa. Zebras and horses are closely related, but over the course of a long period of evolution and genetic variation, zebras gradually diverged from the genus *Equus* to form a unique zebra subgenus. It is a species under the genus *Equus*. It is hoped that this study will give scholars a different understanding of the two animals and call on people to start the importance of protecting wild animals.

**Keywords:** Serengeti savannah, evolution and genetic variation, protecting wild animals.

## 1. Introduction

The Serengeti Savannah covers 15,000 square kilometres of grassland in the southern part of the Great Rift Valley and in the northern part of the Republic of Tanzania in Mara, Arusha and Shinanga districts. In 1956, it was integrated with Ngorongoro Biological Reserve, which was internationally recognized and included in the World Cultural and Natural Heritage List. It has become a UNESCO biological reserve in Man and Ecology, with about 70 species of large mammals and 500 species of unique birds. The semi-annual migration of large animals is one of the ten wonders of nature tourism in the world. The animals are not safe during their annual migration, which requires passing through wilderness without food, dangerous woods, and rivers full of crocodiles. To reach a safe migration destination through these canals, the animals must use their different skills and work together to reach their destination with minimal damage, which is a daunting task. The Serengeti is home to the largest animal community that the earth has ever offered to human beings: countless wildebeests, horses, antelopes, spotted hyenas, giraffes, lions, elephants, black rhinos, buffalo, leopards and other world-famous Big Five African animals, as well as more than 300 species of birds, which constitute the largest animal natural ecosystem in the world. Every year between May and June, herbivores in the Serengeti migrate from the central plains to the western region where water is always available; from July to August, some herbivores migrate from the Serengeti to the Masai Mara, forming a spectacle that shocks the world. Some scholars have written that the migratory habits of wildebeests and zebras influenced each other's deaths. They found that, in poor rainfall years, predators kill wildebeest that

are in better condition than those that die of natural causes. In good rainfall years, predators kill wildebeest that are in worse condition than those that die of natural causes. In research so far, there have been able to gather information about how wildebeests and zebras migrate from the Serengeti to the Masai Mara and how they influence each other with different genetic traits. Next step is heading to the Serengeti to photograph the migration of animals.

In Africa, there are vast grasslands, which are home to wild animals. The Serengeti Savannah is a wildlife reserve in Tanzania, and animal migration is a great opportunity to study animals with different genes but similar habits. The two most powerful herbivores are the wildebeest and the zebra, and that very interested in them. So this research topic is Migratory processes and habits of wildebeest and zebra on the Serengeti Savannah, East Africa, mainly including how genetic differences between hornbills and zebras lead to differences in their life and migration habits, and how these traits interact with each other. It is hoped that the results of this study will help people to better understand these two wild animals and appeal to people to protect the environment and wildlife through the animals' experiences. The main part, on the other hand, will introduce the genetic differences between the bushbuck and zebra and the climate of the Serengeti and Masai Mara from a biological point of view, and then describe what might be special about their genes. Further elaboration on their migratory past, etc.

## **2. Migratory processes and habits of wildebeests and zebras**

The plants of the African savanna are xeromorphic. Dry and wet seasons have very different scenery [1]. Every wet season, greenery, vintiane renewal. Every dry season, all things wither and turn yellow. There are many ungulate mammals on the grassland, such as various antelopes, giraffes, zebras, lions, leopards and other beasts. Termites are the most insects. East African plateau with a higher elevation. Due to the high terrain and low temperature, the air pressure will not be too low, but the updraft is weak, which is not easy to form clouds and rain. At the same time, the temperature is low, so the water vapor content in the air is less, so the temperature and precipitation cannot meet the standard of tropical rain forests, so it becomes the savanna climate. The East African Plateau is controlled by alternating equatorial low pressure and trade winds. It is not controlled by equatorial low pressure all year round, so from June to October every year, the air pressure belt and wind belt move to the north. The part of the East African Plateau in the northern hemisphere is in the wet season controlled by the equatorial low pressure, and the part of the southern hemisphere is in the dry season affected by the trade winds. The opposite is true from November to May. So from reading the literature, is known that because of the seasonal climate, the animals on the savannah begin to migrate to the northwest of the Serengeti in mid-to-late May, as the dry season comes. Chasing grass and water. June is the lactation season when hundreds of thousands of wildebeest are born on the migration trail [2]. The drought continues from July-August, and the animals cross the border to live where there is food and water. Cross the Mara River to Masai Mara until September. In October the Serengeti grasslands turn green with rain. Meanwhile, the Masai Mara, about one-tenth the size of the Serengeti, is not big enough to support millions of exotic animals. The animals then migrate south from the eastern front to the Serengeti, and back again until November [3]. Wildebeest and zebra are the most representative herbivores on the African savannah [4]. Every time when the climate is alternating between dry and wet, herds of wildebeest and zebra will migrate northwest from the Serengeti savannah in Tanzania to the Masai Mara Savannah in Kenya, which is very spectacular. The zebra is closely related to horses. It is a species under the genus *Equus* [5]. Both zebras and horses belong to the genus *Equinae* of the order *Equinae*, mammalian class. They are closely related, but in the process of long-term evolution and genetic variation, zebras gradually diverge from the genus *Equine* and form a unique subgenus *zebra* [6]. And wildebeests don't actually have horse genes, they're cows. From the perspective of biological classification, wildebeest belongs to the genus *Wildebeest* of the bovine family, *Artiodactunus*, class. With thick limbs and strong muscles, wildebeest are close to the size of ordinary cattle. It often feeds on fresh weeds and leaves, indicating that wildebeest is closely related to cattle. From the perspective of biological classification, it can be seen that the wildebeest does not belong to

the horse family, mainly in the biological world in the taxonomy of the phyla family species and the horse appeared differentiation [7]. Wildebeests and cattle belong to the order, while zebras and horses belong to the order Ododactyla. The main difference between and ododactyla lies in that the third and fourth toes of the hooves of the order are equally developed and of equal length, while the first, second and fifth toes disappeared or degenerated. The number of toes is even and the hooves are sheath at the end of the toes. Artiodactyla animals generally have severely degenerated incisors but well-developed molars, a short tail, multiple stomach chambers, and a strong ability to digest plant fiber. In contrast, the odd-ungulates mainly carry the weight on the third toe of the hoof, but all the other toes are degenerated or disappeared. The number of toes is singular, and they also have a sheath hoof at the end of the toe. These animals generally have the superior running ability, developed incisors, more defunct canine teeth, and less complex stomachs than artiodactylans, but a relatively well-developed cecum that assists in digesting plant fibers. Most of the even-toed ungulate herbivores need to digest plant fiber, which is the selective diversity of biological genes.

The spotted wildebeest is found deep in the interior of Africa for long periods and in migratory areas for short periods. It was not discovered in large numbers until the early 20th century, thus escaping the extinction of the biosphere and preserving its instincts. It is currently only seen migrating in the Masai Mara and the Serengeti Savannah and Cafu. One of the most moving scenes on the East African savanna is the massive migration of millions of wildebeest, hundreds of thousands of zebras and antelopes across Tanzania and Kenya in search of food and safe places to breed and give birth during the dry season [8]. Many people refer to the great migration of animals in East Africa as the wildebeest migration, because wildebeests make up the majority of all animals, about 1.5 million. Zebras, who number about 300,000, are at the end of the line. Wildebeests and zebras migrate together, not because they are closely related, but because they have a completely complementary set of adaptations [9]. Zebras have long front teeth and like to eat long grass, which is the top of the grass stem. Wildebeests feed mainly on short grass, the underside of which has been chewed by zebras, and their teeth can latch onto juicy shoots. In this way. The second reason is that the wildebeest follows the zebra and enjoys the zebra's superior intelligence. Zebras seem to have a better memory, according to the biogenetic reports, recalling previous migration routes and remembering relatively dangerous and safe places in equal detail. This talent is especially useful when they have to cross the treacherous Mara and Grumeti rivers. Wildebeests jump blindly, leaving their hopes of survival to Luck, and zebras are better at spotting crocodiles lurking in the river to escape predation. Wildebeests, on the other hand, are natural diviners. Their physiology allows them to drink water at least every other day, thanks to their highly developed sense of smell. This sense of smell allows them to detect water even in the driest of times [10]. This gift is indeed complementary to the wildebeest's friend, the zebra. At the end of May, herds of wildebeest and zebras moved clockwise to the northwest grasslands, following a relatively fixed annual migration route in memory of the zebra superhard. Migratory groups are briefly stranded on the south bank of the Grumiti River. Wildebeest migration season is an annual feast for crocodiles. Crocodiles hide in the Grumiti River during dry years. When the horned horse came to the river, the first thing he did after so much walking was drink. If the wildebeest do not spot the crocodile lurking in the water, the crocodile will break out of the water and quickly grab an unsuspecting wildebeest that is drinking from the river, dragging it into the water. Then a group of crocodiles in the water pounced on the falling wildebeest, tearing it to pieces alive and swallowing it. Not daring to stop at the sight of their companions being eaten, the wildebeest gather in dense clusters along the river, crowding and tramping across the Grumiti River. After that, the wildebeest move north, along a broad migration route to the Mara River on Tanzania's border with Kenya. The Mara River is one of the wildebeest's most difficult natural obstacles -- its banks are steep, its waters are swift, and crocodiles, hungry for a year, swim underwater. The wildebeest migration across the Mara River is spectacular. The moving wildebeest, facing a natural river course, will stop on the bank for a while, however, the trailing wildebeest, unaware of why the individual in front has stopped, will continue to swarm. As a result, wildebeests and zebras crowded along the riverbank, leading to a serious blockage. The herd of wildebeests from behind pushed the ones in front down the bank and into the water. The

crocodile attack caused great panic again. But they have no choice but to plunge down the steep bank and into the rapids as they struggle to avoid the ferocious crocodile. Apart from the unfortunate drowning individuals swallowed by crocodiles, herds of wildebeest swim across the Mara River before catching their breath on the grass.

For all the animals on these migrations, the annual migration is a test of life and death. On the way to migration, they are under attack, so to speak. There are lions, leopards and hyenas chasing behind, and Nile crocodiles waiting in the Mara River ahead... It's a dangerous journey, but it's very important for the whole group. Animals migrate in search of better sources of water and food so that the group can survive and reproduce. At the same time, in the dangerous migration journey, a large number of groups are selected by natural selection, the old and the weak are eliminated, while the strong continue to survive, which keeps the group young and healthy, so as to ensure its reproduction and survival. With the development of modern society, human activities have a profound influence on animal migration. The great migration of animals in Africa is not affected at all. Most, people who want to see this natural wonder come to the African grasslands to watch. As for the migration of some other animals, such as birds, high-voltage lines in the air and bright street lights at night may interfere with their migration. In addition, the construction of some railways and expressways may hinder the footsteps of some migratory animals to some extent. Therefore, what people can do is to develop modern society properly on the basis of trying not to disturb their life, and not to harm them.

### 3. Conclusion

Zebras and horses are closely related, but over the course of a long period of evolution and genetic variation, zebras gradually diverged from the genus *Equus* to form a unique zebra subgenus. Wildebeests don't have horse genes. They're cows. From the point of view of biological classification, wildebeest belongs to the genus wildebeest, order artiodactylungula. The wildebeest has thick limbs and strong muscles and is close to the size of the common cow. Many people refer to the Great animal migration in East Africa as the Great Wildebeest migration because wildebeests make up the majority of all animals, about 1.5 million of them. There are about 300,000 zebras. Wildebeests and zebras migrate together, not because they are closely related, but because their adaptations complement each other perfectly. Zebras have long front teeth and like to eat long grass, which is the top of the grass stem. The wildebeest's main diet is a short grass that has been chewed by zebras, and their teeth can hold onto juicy shoots. The second reason is that wildebeests follow zebras and enjoy their superior intelligence. Biogenetics has shown that zebras have a better memory and can accurately remember the dangers and routes of their annual migration, leading other animals to safety. And wildebeests are born prophets. Thanks to their highly developed sense of smell, they can pinpoint water sources. So it does seem that wildebeests and zebras have complementary survival skills. For all the animals on the move, the annual migration is a test of life and death. Wildlife protection is something that all countries in the world are doing at present, and through years of efforts, human protection of wildlife has begun to show results, which can be seen from the reports of the reappearance of some "disappeared" wild animals and the frequent occurrence of wild animals in recent years. People want to protect wild animals, to protect wild animals is to protect human beings themselves.

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