Animal species of this issue

Water buffalo (Bubalus bubalis)

The water buffalo or domestic Asian water buffalo (Bubalus bubalis) is a large bovine animal, frequently used as livestock in southern Asia, and also widely in South America, southern Europe, north Africa, and elsewhere.

Buffalo are used as draft, meat, and dairy animals. Their dung is used as a fertilizer and as a fuel when dried. In Chonburi, Thailand, and in South western region of Karnataka, India, there are annual water buffalo races known as Kambala. A few have also found use as pack animals carrying loads even for Special Forces.

Adult Water Buffalo range in size from 400 to 900 kg for the domestic breeds, while the wild animals are nearly 3 m long and 2 m tall, weighing up to 1,200 kg; females are about two-thirds this size.

River buffalo are usually black and have long curled horns, whereas swamp buffalo can be black or white, or both, with gently curved horns. The largest recorded horns are just under 2 meters long.
Characterizing the Gonadosomatic Index and Its Relationship with Age in Greater Cane Rat *(Thryonomys swinderianus*, Temminck)  

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**Abstract**

This work investigated the gonadosomatic index (GI) by weight and by volume and its relationship with age in the greater cane rat raised in captivity at Igbesa, a suburb of Agbara Industrial layout in Ogun state, Nigeria. The actual weights and volumes of the testes of 18 sexually matured male animals, obtained after sacrificing the rats, were used to evaluate the gonadosomatic indices. The results obtained showed that the cane rat has low investment in its spermatogenic tissue and spermatogenesis having GI by weight and by volume of 0.053% and 0.059% respectively, compared to other rodents like mouse (*Mus pahari*, 3% in *Mus spicilegus*), 0.72% in gerbils, 0.3 - 9.1 in lemur and 0.88% in African giant rat. Also, it was observed that low relationship existed between testicular size ($r^2 = 0.23$, $p<0.05$) and the GI ($r^2 = 0.41$, $p <0.05$) in sexually matured males. The result showed that as the animal ages even with increased body weight its GI declines. These observations can serve as aid for farmers involved in captive rearing of this animal and contribute to the knowledge of the reproductive biology of the male cane rat.

**Key words** Captive rearing, gonadosomatic index, greater cane rat, spermatogenesis.

**Introduction:**

The greater cane rat (*Thryonomys swinderianus*, Temminck) is a prolific wild rodent, of the order *hystricomorpha* that is vigorously hunted and exploited in most areas, particularly in West Africa South of Sahara (Asibey, 1974; Ajayi and Tewe, 1980). It is currently undergoing domestication and captive rearing in this region and the recent trend in its farming is towards increased stock levels and intensification of production practices (Adu et al, 2005). Thus, a good understanding of the reproductive biology particularly the anatomy of the male reproductive system is very vital (Segatelli, 2004). According to Setchell (1992), a number of factors that can influence reproduction are changed by the simple act of holding wild animal in captivity. One of such factors is the gonadosomatic index of the male reproductive system.

The gonadosomatic index which is either the testicular volume per body weight or testicular volume per body surface area (Setchell, 1992) is one of the most frequently used parameters in the functional evaluation of reproduction in captive populations of animals. It is a simple index that is easy to calculate and gives an indication of the relative investment of the animal in sexual reproduction (Kleiman, 1971). The relationship between testicular size and the gonadosomatic index is usually linear (Geor, 1994) with a correlation coefficient ($r^2$) of 0.71 and 0.01 for the real and the theoretical testicular size respectively. It has been demonstrated that testicular size is the only index that is significantly correlated with the reproductive performance of the animal (Setchell, 1992). The correlation between the gonadosomatic index and the reproductive performance of the animal is usually strong ($r^2 = 0.75$, $p <0.05$) in the case of captive reared animals (Setchell, 1987) whereas the correlation is weak ($r^2 = 0.31$, $p <0.05$) in the case of wild caught animals (Setchell, 1987).

The **Greater Cane Rat** (*Thryonomys swinderianus*) is one of two species of cane rats, a small family of African hystricognath rodents. It inhabits Africa, south of the Saharan Desert. The cane rat lives by reedbeds and riverbanks.

Cane rats can grow about two feet long in the longest individuals and weighs a little less than 19 lb (8.6 kg). It has rounded ears, short nose, and coarse bristly hair. Its forefeet are smaller than its hindfeet and supports its weight on only three toes. Cane rats live in small groups led by a single male. They are nocturnal and make nests from grasses or burrow underground. The oldest cane rat can live more than four years.

In the country of Ghana and other regions of West Africa, the Greater Cane Rat is usually called a **grasscutter** or **cutting grass**. In both West Africa and Southern Africa, it is considered a delicacy. As a consequence, "grasscutters" are beginning to be raised in cages for sale, and so are sometimes referred to as micro livestock.
Early Embryonic Development of the Liver of the One-Humped Camel (Camelus dromedarius) 

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Abstract

The present study was carried out to highlight the histomorphological structure of the liver of the one-humped camel during early embryonic life. Samples were collected from pregnant she-camels after slaughtering and evisceration. Different embryonic stages were taken and the crown to rump (CVR) length was measured to the nearest millimeter (ranging from 7 to 185 mm). Morphological study revealed that the liver primordium appeared at 7mm CVR length fetuses. At 12mm CVR length the liver was related cranially to the septum transversum and heart, caudally to the primitive spleen, mesogastrium, and primitive stomach and to the lesser omentum while dorsally it was related to the mesonephrous and ventrally to the floor of the abdominal cavity. Lobation of the liver appeared at fetal lengths of 50 mm CVR length. Histological study revealed that the liver parenchyma consisted of a mass of hepatic foci, hematopoietic cells and irregular wide blood spaces. The primordium of Glisson's capsule appeared in fetuses of 75 mm CVR length. Megakaryocytes were noticed among hepatocytes and hematopoietic foci. Sections stained with the Giemsa stain revealed group of mast cells among hepatocytes. Hepatic tissue stained by Methyl green pyronin stained revealed that hepatocytes showed methyl green positive materials while haemopoietic cells showed pyrionophilic positive granules at 12 mm CVR length fetuses. Small sized mitochondrial granules appeared in the cytoplasm of the hepatocytes stained with Iron hematoxylin in fetuses of 12 mm CVR length. Hepatocytes were faintly stained with PAS. Electron microscopic study revealed that the hepatocytes of 185 mm CVR length camel fetuses contained large glycogen globules in addition to abundant mitochondria. Histomorphometric studies were applied to compare the mean number of hepatic foci to that of hematopoietic foci and also to measure the number and size of megakaryocytes.

Key words

Prenatal development, Liver, Camel.

Introduction

The liver is a vital organ for mammalian species. It is the site of metabolic processing of all nutrients consumed by the animal. The hepatic tissues have a great capacity of regeneration and compensation for increased metabolic demands (Jones and Spring-Mills, 1977).

Animal species in this issue

Donkey (Equus asinus)

Donkeys or Asses were first domesticated around 3000 BC, approximately the same time as the horse, and have spread around the world. They continue to fill important roles in many places today and domesticated species are increasing in numbers, but the African wild ass and another relative, the Onager, are endangered. As "beasts of burden" and companions, asses and donkeys have worked together with humans for centuries.

Donkeys vary considerably in size, depending on breed and management. Most domestic donkeys range from 0.9 to over 1.4 m tall.

Donkeys have developed very loud vocalizations, which help keep in contact with other donkeys over the wide spaces of the desert. The best-known call is referred to a "bray," which can be heard for over three kilometers. Donkeys have larger ears than horses. Their longer ears may pick up more distant sounds, and may help cool the donkey's blood. Donkeys in the wild can defend themselves with a powerful kick of their hind legs as well as by biting and striking with their front feet.

Donkeys' tough digestive system is somewhat less prone to colic than that of horses, can break down near-inedible vegetation and extract moisture from food very efficiently. As a rule, donkeys need smaller amounts of feed than horses of comparable height and weight. Because they are easy keepers, if overfed, donkeys are also quite susceptible to developing a condition called laminitis.
Abstract

Nine mature female ostriches (*Struthio camelus*) aged 37-49 months were used for the present study. The samples were taken during the period from September to November from Al-amasreya ostrich farm, immediately after sacrifice and evisceration. Pieces from the different segments of the left oviduct were taken, then fixed in 10% neutral buffered formalin and Bouin’s and Susa solutions for the light microscopic study and in 2% gluteraldehyde for both scanning and transmission E/M examination.

For light microscopic study the slides were stained with Harri’s haematoxylin and eosin, Crossman’s trichrome stain, Weigert’s elastic tissue stain and Periodic acid Schiff technique (PAS). The right oviduct is rudimentary, while the left one is well developed and is formed of five segments, namely: infundibulum, magnum, isthmus, uterus, and vagina.

The scanning E/M revealed that the lining epithelium of the oviduct is folded and formed of pseudost ratified columnar ciliated cells. The cilia were slender, dense uniformly arranged, and identical in length.

In magnum, isthmus and uterus the scanning E/M study revealed the presence of openings between the cilia for the secretion of the tubular glands of the lamina propria.

The results obtained were discussed with the available literatures.

Key words
Ostrich, Oviduct, Scanning E/M, Transmission E/M

Introduction

The ostrich, *Struthio camelus*, is the sole species of the family Struthionidae and is the largest living bird. Ostriches provide man with food, clothing, utensils and adornment.

The female ostrich lays an egg every other day. The Red Neck Ostrich can lay 5-15 eggs in the breeding season, while the Blue Neck ostriches lay 30-60 and the Black Neck ones yield 60–120 eggs. Eggs are formed in the left oviduct of the female birds (Bradley, 1928; Cole, 1938; Hodges, 1974; and Bakst, 1978) in fowl; (El-Habbak, 1990) in Pekin ducks; (El-Bargeesy, 1990) in turkey; (El-Sayed, 1994) in geese, duck and pigeon.

Camel is an even-toed ungulate within the genus *Camelus*, bearing distinctive fatty deposits known as humps on its back. There are two species of camels: the dromedary or Arabian camel has a single hump, and the Bactrian camel has two humps. They are native to the dry desert areas of West Asia, and Central and East Asia, respectively. Both species are domesticated to provide milk and meat, and as beasts of burden.

The average life expectancy of a camel is 40 to 50 years. A fully grown adult camel stands 1.85 m at the shoulder and 2.15 m at the hump. The hump rises about 30 inches (76.20 cm) out of its body. Camels can run at up to 65 km/h (40 mph) in short bursts and sustain speeds of up to 40 km/h (25 mph).

Fossil evidence indicates that the ancestors of modern camels evolved in North America during the Palaeogene period, and later spread to most parts of Asia. Humans first domesticated camels before 2000 BC.

Camels are able to withstand changes in body temperature and water content that would kill most other animals. Their temperature ranges from 34 °C at night and up to 41 °C during the day, and only above this threshold will they begin to sweat.
Animal species in this issue

Ostrich (Struthio camelus)


The Ostrich, Struthio camelus, is a large flightless bird native to Africa. It is the only living species of its family, Struthionidae and its genus, Struthio. Ostriches share the order Struthioniformes with the kiwis, Emus, and other ratites. It is distinctive in its appearance, with a long neck and legs and the ability to run at maximum speeds of about 72 km per hour, the top land speed of any bird). The Ostrich is the largest living species of bird and lays the largest egg of any living bird.

The Ostrich is farmed around the world, particularly for its feathers, which are decorative and are also used for feather dusters. Its skin is used for leather and its meat marketed commercially.

Ostriches usually weigh from 63 to 130 kilograms. The long neck and legs keeps their head 1.8 to 2.75 metres above the ground, and their eyes are said to be the largest of any land vertebrate — 50 millimetres in diameter, they can therefore perceive predators at a great distance. The eyes are shaded from sun light falling from above.

The strong legs of the Ostrich, like those of other birds, are scaled and unfeathered. The bird has just two toes on each foot (most birds have four), with the nail on the larger, inner toe resembling a hoof. The outer toe lacks a nail. The reduced number of toes is an adaptation that appears to aid in running.