



E-ISSN: 2278-4136  
P-ISSN: 2349-8234  
JPP 2018; SP1: 2897-2898

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## Comparison of uterus in heifer and she buffalo by corrosion cast technique

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### Abstract

The cost effective corrosion cast technique was utilized for the comparison of uterus of she buffalo and heifer. The fresh samples were utilized for this study and silicone resin was injected to prepare the cast of uterus. The uterine corrosion cast depicted its gross morphology. The uterus was bicornuate in type and it consisted of two horns, a body and a cervix. The uterine horns were connected to the cervix via the uterine body and horns were directed upwards, outwards and downwards. The body was short cylindrical and connects the cervix to the uterine horns. The cervix formed the caudal end of the uterus and composed of spiral rings which were the impressions of cervical mucosal folds. There exists some differences in the morphometry of uterus of she buffalo and heifer. This study may be ideal for the comparative anatomical study of uterus of various species by corrosion cast technique.

**Keywords:** uterus, heifer, buffalo, corrosion cast technique

### 1. Introduction

Corrosion cast are an established technique to study the 3-D structure of luminal organ, blood vessels and ductal system. This technique is cost effective and rapid and can be used to prepare a model of an organ to illustrate the different parts. Differences exist in anatomy of she buffalo and heifer. The aim of the study was to compare the anatomy of non-pregnant uterus of she buffalo and heifer. The diversity of uterine morphology among mammals is remarkable and showed variations within species according to age. Thus, they can be displayed in the museum and used effectively for teaching (Tamilselvan *et al.*, 2017).

### Materials and Methods

In the present study, fresh specimen of uterus from heifer about 1.5 years of age and she buffalo about 3.5 years of age were collected at local slaughter house. The collected specimens were subjected to various processes and corrosion casts were prepared.

#### a. Pre-casting treatment

The collected specimens were washed under running tap water to remove blood and debris. Then the adjacent structures and tissues attached to the uteri were removed by careful dissection. Afterwards, 0.9% normal saline solution was injected into the lumen of the uterus through the external os of the cervix by using syringe and flushed to clear the lumen. Then the specimens were immersed in 70% isopropyl alcohol for one hour to remove the water absorbed by the specimen during cleaning and flushing (Sivagnanam *et al.*, 2014).

#### b. Injection of casting media

After removal of water from the specimen, ligation was made at the junction of horn of the uterus and fallopian tube to prevent resin to reach fallopian tube. Then white colored silicone resin was injected through the external os with the help of silicone gun. Then the silicone resin was gradually pushed into the uterus and milking was done on the body and horn of the uterus to spread and completely fill the lumen of the uterus.

The injection was continued until a resistance was felt and great care was taken to avoid leakage from the injection site. Afterwards, the ligation was made at the end of the cervix to prevent backflow until the polymerisation of resin was completed. Then the specimens were allowed in vertical position for 24 hours for complete polymerisation of silicone resin. The next day, the specimens were immersed in a large glass container with 50% hydrochloric acid for two days to digest all the parenchymatous tissue. (Nelson, 1987).

Once all the parenchymatous tissue got digested by the acid, the cast of uterus was removed from the hydrochloric acid and washed in running tap water, dried and used to compare the

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different gross anatomical features of uterus in she buffalo and heifer.

### Results and Discussion

In the present study, the corrosion cast made from silicone resin depicts the gross morphology of uterus in she buffalo and heifer. In bovidae family, the uterus was bicornuate in type and it consisted of two horns, uterine body and cervix. Each part showed minor differences in morphometry.

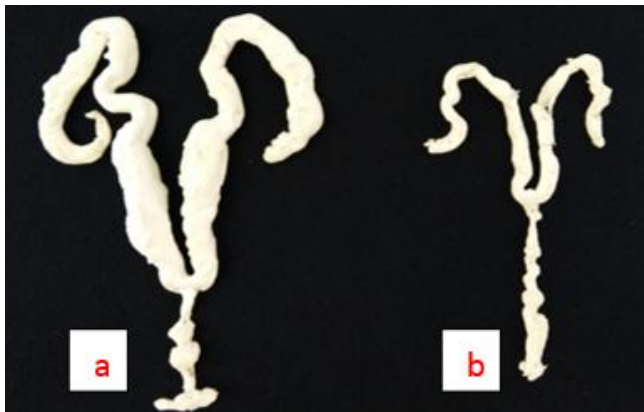
#### a. Uterine horn

The uterine horns were connected to the cervix via the uterine body and horns lied nearly parallel to each uterus. The horns were more extensive and tapered gradually towards the free end and continued as oviduct so that junction between horn and uterine tube was not abrupt. The horns were curved at first downward, forward, outward and then turned backward and upward so that the arrangement formed a spiral coil (Sisson and Grossman, 1953).

The length of the horn was recorded as 30 cm in uterus of she buffalo and 20cm in heifer. But Sisson and Grossman (1953) mentioned that the length of the horn was 35-40cm in exotic cow. The variation in the length of she buffalo and heifer may be influenced by calving status and age of the animal. The corrosion cast showed smooth surfaces on its both dorsal and ventral aspect except in the region of caruncles which implied the smooth internal wall of horn of uterus.

#### b. Uterine body

The body was short cylindrical and connected the cervix to the uterine horns. The length of the body was about 4cm in she buffalo and 2cm in heifer. As mentioned here, the length of the body was about 2.5cm to 4 cm in cow (Roberts, 1971). The horns were diverged forwards from the cranial end of the body.



**Fig 1:** Photograph of uterine cast of **a.** she buffalo and **b.** heifer

#### c. Cervix

The cervix formed the caudal end of the uterus and composed of spiral rings which were the impressions of cervical mucosal folds. The cervical length was recorded as 6cm in she buffalo and 4cm in heifer. The length of the cervix in exotic cow was 5-10 cm, the variation may be due to parity and age of the animal (Roberts, 1971). The cervix was clearly demarcated from the body of the uterus by an opening, internal uterine orifice/internal os which appeared as constriction between the body and cervical rings in the corrosion cast.

The communication between cervix and vagina was indicated by an opening, external uterine orifice/ external os which appeared as a depression surrounded by an elevated area of

corrosion material. The elevated area of corrosion cast material was the cervical projection into the vagina.

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