

Morphology and Morphometry of Female Genital System of Mizo Local Pig (Zovawk)

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Abstract:

The present investigation provides a baseline data on gross anatomy of female reproductive system of Mizo local pig (Zovawk). The organs can be divided functionally and morphologically into the ovaries, and the tubular organs, which lead from the ovaries through the pelvis to the outside. The tubular organs consist of the uterine tubes, the uterus, and the copulatory organ. The copulatory organ is subdivided into vagina, vestibule and the vulva. The uterus is apparently U-shaped and the diverging horns were long, flexuous and almost reach the caudal extremities of the ovaries. The mesovarium was long. The mesosalpinx was highly vascular, arises from the lateral surface of the mesovarium and the adjacent part of the mesometrium. It contained the uterine tube and formed a large cone-shaped ovarian bursa which concealed the ovary. The mesometrium was attached dorso-laterally to the uterine horns and corpus uteri, originating from the dorso-lateral walls of the abdominal and pelvic peritoneal cavity. The cervix uteri were not covered by peritoneum. The overall biometrical value in respect of organs of female genital system in the present study was lower than the common large breed of pigs.

Key words:

Morphology, Morphometry, Female genital system, Mizo local pig

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INTRODUCTION

Mizo local pig is a non-descript breed popularly known as Zovawk (Fig.1). They are very timid and sensitive. However, lactating mothers are very aggressive. They are smaller in size and the adult body weight was approximately 15.0 to 28.0 Kg. There is scanty literature regarding the anatomy of this non-descript breed in general and biometry in particular. Morphological knowledge of the genital system is important for artificial insemination and obstetrical problems. Therefore, an attempt was made to record the base line anatomical data of the female genital organs along with the gross morphology of this animal.

MATERIALS AND METHODS

Six female Mizo local pigs were acquired for slaughter at the pig farm, College of Veterinary Sciences and A.H., Central Agricultural University, Selesih, Aizawl, Mizoram. All the animals were adult and apparently healthy. Two animals used in the present investigation were parous and four on unbred adult gilts. Their ages were between one to two years and weigh between 15.0 and 28.0 Kg with an average weight of 21.17 ± 2.29 Kg.

All individuals were regularly slaughtered. After removal of the genital tract the specimens were rinsed in clean

water. The inner structure of the uterus, vagina and vulva were investigated after dorsal incision of these tubular organs. Diameters, longitudinal dimensions and thickness were measured by means of a slide calipers and measuring tape as per standard procedure [1] [2] followed by photographic documentation. The weight of the organs was taken by electrical digital balance. The data were statistically analyzed by Snedecor and Cochran [3].

RESULTS AND DISCUSSION

External shape

The organs of female genital system of Zovawk were ovaries, uterine tubes, uterus, vagina, vestibule, vulva and mammary gland as an accessory structure (Fig.1, 2). The uterus of Mizo local pig was U-shaped when viewed dorso-ventrally in its normal physiological position. The diverging horns were long, flexuous and almost reach the caudal extremities of the ovaries. The overall size of the organ was smaller than observed in the common large breed pigs by Getty [4] and Nickel *et al.* [5]. The mesovarium was long. The proper ligament of the ovary originated from the uterine end of the ovary, and radiated into the mesometrium. The mesosalpinx was highly vascular and originated from the lateral surface of the mesovarium and the adjacent part of the

mesometrium as recorded by Nickel *et al.* [5] in common large breed pigs. It contained the uterine tube and formed a large cone-shaped ovarian bursa which concealed the ovary. The mesometrium was attached dorso-laterally to the uterine horns and corpus uteri, originating from the dorso-lateral walls of the abdominal and pelvic peritoneal cavity. The cervix uteri were not covered by peritoneum.

Ovaries and their functional bodies

Measurements of the ovaries are given in Table 1. The ovarian dimensions vary between 1.55 and 1.90 cm in length, 0.78 and 1.15 cm in width and 1.0 and 1.35 cm

in thickness. These findings were lower than the findings of Getty [4], Nickel *et al.* [5] in common large breed pigs and Das *et al.* [6] in Landrace pigs. These variations might be attributed to the difference in breed, body weight and status of reproduction. The ovaries were cylindrical to bean shaped as observed cylindrical shape by Sisson [7] and Nickel *et al.* [5] in common large breed pigs. The surface of the ovary was tuberculate in appearance due to the presence of large number of follicles and corpora lutea (Fig.3). Each ovary was completely enclosed in ovarian bursa.

Table 1. Body mass (BM in Kg) of Mizo local pig (N. 1-6) and their ovarian dimensions

N	BM	LO (L/W/T)	RO (L/W/T)
1	15.0	1.60/0.90/1.05	1.65/0.98/1.10
2	15.0	1.55/0.78/1.0	1.58/0.90/1.0
3	25.0	1.75/0.98/1.25	1.70/1.02/1.25
4	17.0	1.68/0.95/1.10	1.68/1.0/1.20
5	27.0	1.80/1.04/1.30	1.76/1.10/1.30
6	28.0	1.90/1.14/1.34	1.82/1.15/1.35
Mean	21.17	1.71/0.97/1.17	1.70/1.03/1.20
SE	2.29	0.05/0.05/0.05	0.03/0.03/0.05

LO, RO = left, right ovary; L, W, T = length, width and thickness in cm

Inner structures and morphometric data of the tubular parts

The measurements of the tubular parts are given in Table 2. The uterine tubes were long. The fimbriated extremity has a large

abdominal opening. The length of the uterine tube measured in a stretched position was 11.0 to 15.20 cm, its diameter varied from 0.20 to 0.36 cm and the thickness of the wall varied from 0.04 to

0.08 cm. The data of the present investigation was almost similar to the findings of Ahmed *et al.* [8] in local pigs. The thickness of the utero-tubal junction varied from 0.33 to 0.48 cm.

The corpus uteri were short and varied from 0.50 to 1.10 cm in length. The diameter and thickness of the wall were recorded to be 0.90 to 1.20 cm and 0.30 to 0.45 cm, respectively. The cornua uteri were extremely long and flexuous and were freely movable. The length of the cornu varied from 36.50 to 87.0 cm, diameter from 0.70 to 1.14 cm and thickness of the wall from 0.21 to 0.42 cm. The biometrical data recorded in the present study were lower than observed by Getty [4] and Nickel *et al.* [5] in common large breed pigs. The cornua uteri were suspended by extensive muscular broad ligaments. The endometrium was gray in colour, highly vascular and arranged into folds of varying height. These folds of endometrium were higher in the body of the uterus.

The cervix uteri was long measuring 2.60 to 5.65 cm in length, 0.88 to 1.25 cm in diameter and 0.35 to 0.65 cm in thickness of the wall. This biometrical result of the present investigation was in accordance with the findings of Ahmed *et al.* [8] in local pigs. In the present study the cervix was hard and the cranial part of

it lied in the abdominal cavity. The cervical wall was equipped with mucosal folds of varying heights that showed indistinctively tortuous course. The cervical folds were recorded highest in the center and decrease in height toward both ends. The cervical canal gradually widened at the cervico-vaginal junction. The intra vaginal part of the cervix was not observed in the present study as recorded by Nickel *et al.* [5]. The broad ligament of this region contained smooth muscle and uterine lymph nodes. The medial layer of the broad ligament was continuous with the lateral ligament of the bladder.

The vagina was 2.50 to 3.50 cm long, 1.54 to 2.0 cm in diameter and 0.55 to 0.82 cm in the thickness of the wall. The mucous membrane was arranged in high longitudinal folds.

The vaginal vestibule was 2.70 to 3.50 cm in length. The urethra opened into it with a small sub urethral diverticulum on the floor of the vestibule. The mucous membrane formed longitudinal folds.

The labia of the vulva were thick, wrinkled integument and showed few hairs. The ventral commissure was drawn out to a point. The clitoral fossa was about 1.0 cm cranial to the ventral commissure. The body of the clitoris was tortuous. There was a deep central depression about halfway between the clitoral fossa and the

external urethral orifice. Lateral to this fold was a depression in which the ducts of vestibular gland open.

The urethra was 6.57 to 7.17 cm in length and 0.67 to 0.73 cm in diameter. Its caudal part was fused with the vagina and produced a corresponding elevation of the floor of the vagina.

The overall biometrical value in respect of organs of female genital system in the present study was lower than the common large breed of pigs as described

by Getty [4] and Nickel *et al.* [5]. It might be attributed to the difference in breed, body weight and status of reproduction.

The mammary glands were 10 in number and were arranged in two rows, extending from the caudal part of the pectoral region to the inguinal region. They were designated according to the location as thoracic (4 nos.), abdominal (4 nos.) and inguinal (2 nos.). Each teat had two teat canals.

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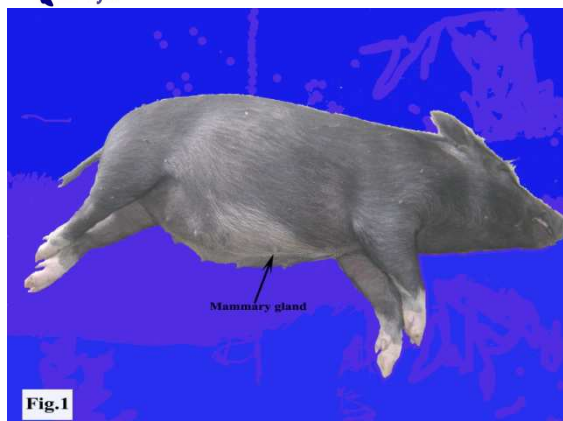


Fig.1: Photograph of female Mizo local pig (Zovawk) showing mammary gland

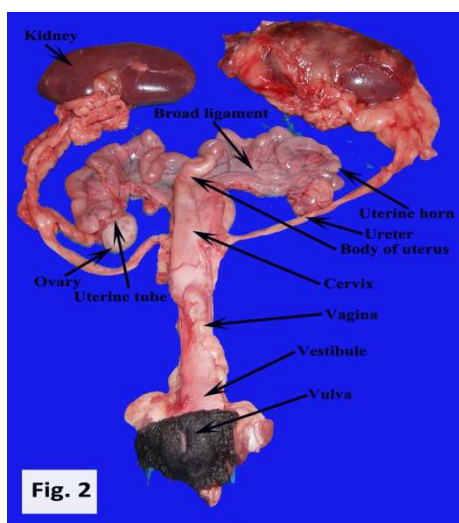


Fig.2: Photograph showing female genital organs of Mizo local pig

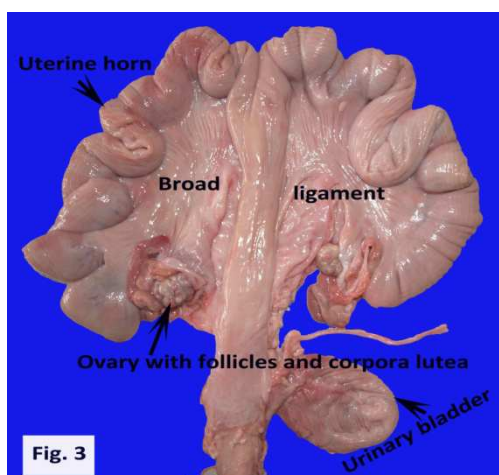


Fig.3: Photograph showing female genital organs of Mizo local pig

Table 2. Morphometric data (Mean \pm SE) of tubular parts of female genital system of Mizo local pig (Zovawk)

Organ	Length (cm)			Width (cm)			Thickness (cm)		
	Right	Left	Overall	Right	Left	Overall	Right	Left	Overall
Uterine tube	12.71 \pm 0.54	13.35 \pm 0.58	13.03 \pm 0.39	0.27 \pm 0.02	0.30 \pm 0.02	0.28 \pm 0.02	0.06 \pm 0.00	0.06 \pm 0.01	0.06 \pm 0.00
Uterine horn	48.55 \pm 7.76	48.23 \pm 5.43	48.39 \pm 5.20	0.86 \pm 0.07	0.82 \pm 0.04	0.84 \pm 0.04	0.29 \pm 0.03	0.29 \pm 0.03	0.30 \pm 0.02
Uterine body	-	-	0.77 \pm 0.09	-	-	1.03 \pm 0.04	-	-	0.39 \pm 0.02
Cervix	-	-	4.62 \pm 0.48	-	-	1.06 \pm 0.06	-	-	0.53 \pm 0.04
Vagina	-	-	10.02 \pm 0.93	-	-	1.78 \pm 0.07	-	-	0.68 \pm 0.04
Vestibule	-	-	3.10 \pm 0.15	-	-	-	-	-	-