



Research Article

GROSS MORPHOLOGICAL STUDIES ON THE HARDERIAN GLAND OF ZOFAWK (MIZO LOCAL PIG)

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Abstract: The study was conducted on apparently healthy 6 animals of Zovaw (Mizo local Pig). The right and left of the Harderian glands were situated on medioventral region of the eyeball between the periorbita and the bony orbit. The freshly collected Harderian glands were pale pink in colour and their shapes were not similar. Each Harderian gland showed 2 surfaces, 2 borders and 2 extremities. The Harderian glands of both the surfaces were divided into various lobules by shallow grooves. The different biometrical values with regard to weight, length, width and thickness were found to be higher in right sides than the left sides of the Harderian gland. Present study may establish relations between morphological structure and functions of these glands in Zovaw.

Keywords: Zovaw, Harderian gland, Mizo Local Pig

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Introduction

In northeast India, Mizoram is small and remote state where pig rearing is a tradition. The Indigenous pig of Mizoram is locally known as Zovaw [1]. Body coat of the Zovaw is black with white spot on forehead, white patches on belly and white boots. They have erect ears, concave snout, pot belly, concave top line and long bristles on mid-line. Average body weight is 54kg in males and 59 kg in females. They attain puberty at the age of 2.5 months when they are about 4.5 kg body weight [2]. The size of the animal is small and the population of this pig is decreasing day by day [3]. The main function of the Harderian gland is to lubricate the eye whereas other functions vary among species which included as a source of saliva, a site of immune response, a photo protective organ, part of a retinal-pineal axis, a source of pheromones, a source of thermoregulatory lipids, a site of osmoregulation, and a source of growth factors [4]. The studied on the Harderian glands in different mammals has been done by the scientists and researchers but the anatomical study on the Harderian gland of Zovaw (Mizo local pig) is not done and the present study was to set the anatomical norms on the Harderian gland. Therefore, the study was performed to document the gross morphological on the Harderian gland of Zovaw.

Material and methods

In the present investigation, 6 numbers of head from the apparently healthy Zovaw (2 yrs of age) were utilized of either sex. After the animals were slaughtered, the head of each animal was collected. The Harderian glands were dissected out using sterile BP blade followed by recording of biometry of the glands with the help of digital vernier callipers and electronic physical balance. The data of the present investigation was analysed by standard statistical procedure with the help of SPSS 20 (2013) as per Snedecor and Cochran [5].

Results and discussion

The right and left of the Harderian glands were situated on medioventral region of the eyeball between the periorbita and the bony orbit. Similar finding was

observed by Rajkhowa *et al.* [6] in pig where the Harderian gland was found within the orbit located in the medioventral aspect of the eyeball (Fig-1). The freshly collected Harderian glands of Zovaw were pale pink in colour and their shapes were not similar. Different observations were found according to Martin [7] that the Harderian glands were oval in shape in pig and the colour was yellowish brown or yellowish red. Kleckowska and Dziegiel [8] also stated that the deep gland of the third eyelid was pale pink and oval in shape during the examined days of gestation. The ventral half of the right Harderian gland was wider than the ventral half of the left Harderian gland as a result the right Harderian gland was elongated oval in shape whereas the left Harderian gland was elongated in shape. Each Harderian gland showed 2 surfaces, 2 borders and 2 extremities (Fig-2). The dorsal border was strongly convex while the ventral border was concave on its upper two third and convex on its lower one third. Both the anterior and the posterior extremities were rounded and convex and similar finding was observed by Kuhnel [9] stated that the anterior margin was convex. The Harderian glands of both the surfaces were divided into various lobules by shallow grooves. Kleckowska and Dziegiel [8] stated that the Harderian gland of pig fetuses showed a distinct division into lobules which were visible on both surfaces which were similar findings in Zovaw. In the present study, the average body weight of Zovaw was 61.33kg body weight where the sexes were not considered. Prava *et al.* [2] observed the average body weight were 54kg in males and 59 kg in females. The mean weight of the right and left Harderian glands were 4.68 ± 0.60 and 4.35 ± 0.56 respectively and their range was from 2.26 to 6.15g. The mean length of the right and left Harderian glands were 35.23 ± 2.22 and 33.59 ± 2.01 respectively and their range was from 25.44 to 39.2mm. The mean maximum width of the right and left Harderian glands were 18.03 ± 1.20 (RS) and 16.22 ± 0.86 (LS) respectively and their range was from 13.84mm to 20.45mm. The mean thickness of the right and left Harderian glands were 6.06 ± 0.74 (RS) and 5.67 ± 0.58 (LS) and their range was from 4.45mm to 6.69mm. These observations were in accordance with in the Harderian gland of pig Bison by Kleckowska *et al.* [10] and the Harderian gland of Rajkhowa *et al.* [6].

The comparison was observed statistically non-significant increased from the biometrical parameters between the right and left sides of the Harderian gland.

Table-1 Comparative Biometrical Parameters of the Harderian gland Right sides (RS) and Left sides (LS) of Zovawk.

SN	Parameters	Groups	Mean \pm SE		t-Value
			Right side	Left side	
1	Weight of the Harderian glands (gram)	N=6	4.68 \pm 0.60	4.35 \pm 0.56	0.39NS
2	Length(mm)	N=6	35.23 \pm 2.22	33.59 \pm 2.01	0.55NS
3	Width(mm)	N=6	18.03 \pm 1.20	16.22 \pm 0.86	1.23NS
4	Thickness(mm)	N=6	6.06 \pm 0.74	5.67 \pm 0.58	0.42NS

N=6; NS= Non-significant. The significance level was $P>0.05$ (at 5%) between the two groups. There was no difference between the Left side and Right side of the Harderian gland.



Fig-1 Photograph showing in-situ position of the Harderian gland (arrow) of Zovawk

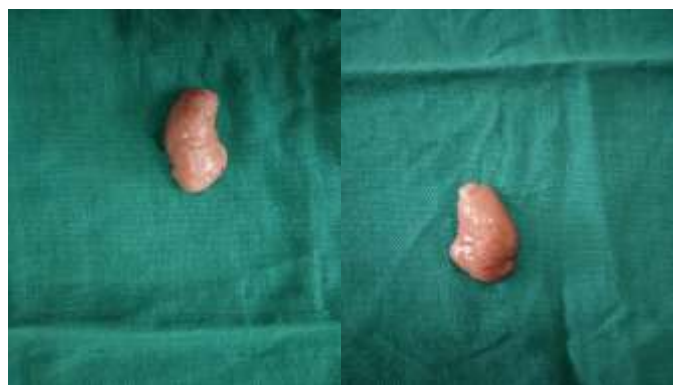


Fig-2 Harderian gland of Zovawk the Left side(I) and Right side(II) showing the anterior(A) and posterior(P) extremities.

Conclusion

In the present investigation, 6 numbers of apparently healthy adult Mizo local Pigs were utilized for detailed gross anatomical study of the Harderian gland. The right Harderian gland was found to be elongated oval in shape, whereas the left Harderian gland was elongated in shape. The mean weight of the right and left Harderian glands were 4.68 \pm 0.60 and 4.35 \pm 0.56, respectively. The mean length of the right and left Harderian glands were 35.23 \pm 2.22 and 33.59 \pm 2.01, respectively.

Application of research: The gross structural studies can be important for establishing relations between morphological structure and functions of these glands in Zovawk. It can have clinical implications especially when taking into consideration the protective mechanisms of the eye. The secretory products of the

HG are important to its functioning. The main function of the secretory products of the Harderian gland is to lubricate the eye and the third eyelid.

Research Category: Veterinary Science

Abbreviations

RS : Right side

LS : Left side

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Sample Collection: Animals brought for slaughterhouse

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