

# Acknowledgement of Submission (Manuscript #JVA-2203-1026)

External

Inbox

**Journal of Veterinary Anatomy** <jssub@ekb.eg>

Sat, Mar 26, 2022,  
2:07 PM

to me, epymuhammadl

Manuscript ID: JVA-2203-1026

Manuscript Title: **Quantitative and Qualitative Analysis of Apertura Orbitaria Kacang Goat of Different Sexes**

Authors: Epy Muhammad Luqman, Soeharsono Soeharsono, Hana Eliyani, Gracia Angelina Hendarti, Widjiati Widjiati

Dear **Dr. Epy Muhammad Luqman**

I wish to acknowledge receiving the of the above mentioned manuscript.

It should be noted that the manuscript will be reviewed for possible publication in the Scientific Journals Management System.

Please be sure that the submitted manuscript has not been published previously and will not be submitted elsewhere prior to our decision.

Our editorial decision will be brought to your attention once the paper has been reviewed due the referees consideration.

I wish to take this opportunity to thank you for sharing your work with us.

Truly yours,

Executive managing Editor of **Journal of Veterinary Anatomy**

## Your manuscript

External

Inbox

**Ashraf Saber** <saberashraf\_2@yahoo.com>

Sun, Apr 3, 2022,  
8:53 PM

to me

Dear Dr.Luqman, Epy Muhammad,

I confirm receiving your manuscript titled: "Quantitative and Qualitative Analysis of *Apertura Orbitaria* Kacang Goat of Different Sexes"

By: Suharsono, S., Elyani, H., Hendarti, G. H., Widjiati, W., Luqman E. M.

Thank you for submitting your manuscript to J Vet Anat

Kind regards,

Ashraf A. Saber

Prof. Dr. A.S.Saber

Emeritus Prof. of Vet. Anatomy & Embryology

Editor-in-Chief of J. Vet. Anat.

Honor. President of African AVA

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**epy muhammad luqman <epy-m-l@fkh.unair.ac.id>**

Sat, Apr 16, 2022,  
2:21 PM

to Ashraf

Dear Prof. Dr. A.S.Saber  
Editor-in-Chief of J. Vet. Anat.  
Department of Anatomy & Embryology  
Faculty of Veterinary Medicine, Sadat City,  
University of Sadat City, EGYPT.

I have revised my manuscript (red text: as per editor's suggestion, blue text: revision by author):

1. I have used the Nomina Anatomica Veterinaria (NAV) for the anatomical terms.
2. I have changed the word "cranium" to "skull" (our study focuses on orbital opening and the orbit rim border). We would correct our object investigation on the term: "skull" rather than "cranium".
3. I have changed the measurement abbreviations to be simpler, which makes the results and discussion clearer (we chose the abbreviation used in Indonesian terms for creating reconstructions of morphometric captures of complex shapes). But now, we are trying to reconstruct more simple abbreviations based on English.  
OW = Orbital width  
SL = Skull length (not cranial length).  
WZF = Width of zygomatic process of frontal bone  
LCRO = Length of the caudal rim of the orbit  
WFZ = Width of the frontal process of the zygomatic
4. I have checked the references for the years and the spelling.
5. I have omitted strange words (from another language).

Thank you.

--

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**Ashraf Saber <saberashraf\_2@yahoo.com>**

Thu, Jun 2, 2022,  
7:31 PM

to me

Dear Dr. Luqman,

I demanded only to correct and only to consider the comments but not to rewrite all the paper for the third time. This means revision of the poor English for the third time. It is a hard work for the Journal. Your manuscript will be revised and finalized as you sent in the last email and will not be returned to you again.

Thank you for choosing J Vet Anat

Ashraf

**Ashraf Saber <saberashraf\_2@yahoo.com>**

Mon, May 9, 2022,  
4:03 PM

to me

Dear Dr. Epy Muhammad Luqman,

I confirm receiving the receipt of paying the publication charge. Thank you.  
Attached is your manuscript, please consider the comments thoroughly and return it back at the earliest.

Kind regards,

Ashraf

# Quantitative and Qualitative Analysis of *Apertura Orbitaria* *Aditus orbitae* of Kacang Goat of Different Sexes

(In the *Nomina Anatomica Veterinaria* (1992), there is no such term *Apertura orbitaria*, but *Aditus orbitae* which means orbital entrance or opening)

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With 2 tables and 2 figures.

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## Abstract

*Apertura orbitaria* *Aditus orbitae* is one of the objects of sexual dimorphism. The study aimed to analyze the *orbital orbital aperture* *aditus orbitae* of Kacang goats of different sexes. The research material in the form of 20 Kacang goat *cranium* consists of 10 pieces heads from female goats and 10 male goats. Measurements are taken on the base width of the *processus zygomaticus ossis frontalis* (LPPZF), the base width of the *processus frontalis os zygomaticus* (LPPFZ), the length in the caudal side rim of the aperture orbit (PDA) and the horizontal diameter of the *apertura aditus* (DOA) as well as the *cranium* skull length (PC). PC measurements are intended as weighting. Data analysis is done with two, quantitatively and qualitatively. Analysis is quantitatively done to analyze the correlation between variables and possible differences in variables in different sexes. The results of the quantitative analysis showed that three of the four variables measured were positively correlated with pc ( $p < 0.05$ ). Variable LPPZF and DOA differ between sexes, either before or after weighting ( $p < 0.05$ ), but not on LPPFZ and PDA ( $p > 0.05$ ). The use of PCs by DOA as weight causes PDAs to differ between sexes ( $p < 0.05$ ), but not on LPPFZ ( $p > 0.05$ ). The conclusion is combining both quantitative and qualitative analysis added more information to the difference in the orbital aperture anatomy of the Kacang goat on a different gender.

**Keywords:** *Apertura orbitaria*; Kacang goat; scientific research; different sexes

## Introduction

Morphological diversity characterizes groups and even individuals. Morphology is determined by the anatomy of the body especially bones as components forming the skeleton of the body. Durable and hard bone structure makes bones as an object of research to identify individuals, especially the field of archaeology. In the study of sexual dimorphism, bones are still the main focus despite the development of soft tissue usage. The pelvic bone became a major object for sexual dimorphism research. This is because the anatomy of reproductive function affects the *pelvic* bones (Ali, et al., 2019; 2020 in references. check! ; Csanády, et al., 2019; Miyakawa, et al., 2016). The link between the function of *the pelvic* bone and *femur*, making *femur* bone as the next choice for sexual dimorphism research (Belhaoues, et al., 2016; Kanchan, et al., 2019; 2021 in references!). In human, sexual dimorphism can also be identified through the bones of the upper limbs (Tomczyk et al., 2017; Atamtürk, et al., 2019; Hunter, et al., 2019). Identification of sexes that use bones such as *pelvis*, *femur* and upper motoric limbs is called identification of sexual dimorphism with bone objects - *post cranial* bones. The second way is to identify through the anatomy of the *cranium*. The consideration of *cranium* as a research object because in addition to morphology *cranium* controlled by genes is more homogeneous than bone-*post cranial* bone (Plavcan, 2012; Zichello, et al., 2018; Kasimatis, et al., 2020). Research using dogs or sheep proves that there are differences in cranium size in different sexes (Elledge, et al., 2008; Casanova, et al., 2020; Abbazabadi, et al., 2020).

In a narrower space *apertura orbitaria* is one of the variables that are interested in research into sexual dimorphism. *The orbital apertura* is arranged by three bones, namely the upper *os frontale* then rotates counter-clockwise, each is *Os lacrimale* and *os zygomaticus* (Choudhary, et al., 2018). In goats *the Os frontale* meets the *Os zygomaticus* through *the processus* forming a caudal *apertura wall of orbitaria*.

*Orbital apertura* research generally uses more quantitative approaches. The translation of shapes into numbers facilitates the anatomical understanding of an object with the provision that the variable in question has the same

shape and size (Mitteroecker, et al., 2013). Not all anatomical forms can be reached by quantitative methods such as *orbital apertura*. In general, the *orbital apertura* is circular. The quantitative approach that has been done so far is to measure the diameter. The size may have parts that are separated from the claiming so as to get biased results, especially research that is comparing. Great hopes of combining qualitative analysis into quantitative analysis will get clearer information. The study aims to lyse differences in *orbital apertura* anatomy in different sexes through quantitative and qualitative approaches in Kacang goats.

According to statistics data until 2021 show that goats have the largest population compared to other livestock except poultry (Dataku Application, 2021). Kacang goats have the largest population among the other breed of goat. *Kacang* goat characterized by short fur of a single color (white, black or brown), hanging short ears, has horn, and bearded on the male (Insan and Isaac, 2020).

## Materials and Methods

### **Material**

The research material are the *craniums skulls* of adult Kacang goat aged 2-3 years, collection of Division of Veterinary Anatomy, Faculty of Veterinary Medicine Universitas Airlangga Surabaya. The number of *craniums skulls* are twenty *pieces*, consisting of ten *craniums skulls* of male goats and ten *craniums* of female goats. Measurements *of the material were done* using a sliding caliper with a precision of 0.01 mm.

### **Method Research**

Research methods are carried out in two ways, quantitatively and qualitatively. Quantitative approaches are measurement of *cranium* (*do you mean skull length!!*) length (PC), base width of *processus zygomaticus ossis frontalis* (LPPZF) and base width of *processus frontalis os zygomaticus* (LPPFZ). *Cranium* length (PC) is measured from *protuberantia externa* to the very *front rostral* end of the *incisivum-os Os incisivum*. Measurement of the length of the inner side of the caudal *apertura orbitaria aditus orbitae* (PDA)

wall is done by measuring the distance of the *medial* side point of the **zygomatic process of the frontal bone (LPPZF)** to the same point on the **frontal process of the zygomatic bone (LPPFZ)**. The measurement **was** also carried out at the diameter of the **orbital-apertura aditus orbitae** as measured from the encounter of the LPPZF with the LPPFZ towards the farthest foreground curve from the **orbital-apertura aditus orbitae**. The qualitative method is performed by observing the shape and edge of the back down to the **front rostral** side of the **orbital-apertura aditus orbitae** .

### **Presentation and Analysis of Data**

The measurement data is arranged in a table presented in the form of mean and standard deviations (while  $\bar{X} \pm sd \text{ mm}$ ) qualitatively presented in descriptive interpretation. The significance of the relationship between the variable is tested with correlation Pearson. The data is correlated if p is less than five percent. If the measurement results are more than two variables that are correlated then weighting is done on each variable with the PC. Differences in each variable in different sexes are analyzed with the unpaired T test, but if there is a correlation then the data is tested with the General Linear Model Repeated Measure with two factors. The first factor is gender and the second factor is due to weighting. If the data after weighting is does not have difference, then it is repeated with DOA as weighting, then the statistical test repeated again whether there is an establishment or not after the weighting of the two. Data analysis uses SPSS software version 20.

**What do you mean by cranium in your measurements!! Cranium is a part of the skull.**

## **Results**

### **Quantitative Analysis**

**Cranium** Skull length is positively correlated with LPPZF, LPPFZ, DOA ( $p < 0.01$ ). This means that any PC changes will be followed by changes in LPPZF, LPPFZ and DOA, with the characteristic of unidirectional change. Among the variables only LPPZF and LPPFZ are correlated ( $p < 0.05$ ). Length in **Apertura aditus orbitae**(PDA), does not correlate with either all **aperture aditus** variables or P ( $p > 0.05$ ). In connection with the acquisition of three variables that are correlated, then the analysis of the data is further

weighted each variable with the PC as a weighter then analyzed again. (what is meant by weighted and weighter? May you mean compared!!)

The results of statistical analysis get LPPZF and DOA female goats wider than male goats ( $p < 0.01$ ). Weighting affects the magnitude of frontal process of the zygomatic bone (LPPZF) and horizontal diameter of the *apertura aditus* (DOA) ( $p < 0.01$ ) but does not affect the decision that there is a difference between LPPZF and DOA between in the two sexes (Table 1). It can be seen from the difference in LPPZF either in the time before weighting or after weighting. Significant differences also occur in frontal process of the zygomatic bone (LPPZF) and PDAs, but these differences are not due to gender but rather due to weighting ( $p < 0.01$ ). It's different if in LPPZF and PDA associated by DOA.

The result obtained is that the female Length in *aditus orbitae* (PDA) is  $0.705 \pm 0.045$  while in the male one it is  $0.763 \pm 0.059$ , between the two shows a with a significant difference ( $p < 0.05$ ). The amount (size!) of LPPZF even though it is weighted by DOA, still does not show a significant difference ( $p > 0.05$ ).

### **Qualitative Analysis**

Overall, the *orbital apertura aditus orbitae* of female goats is elliptical while in males it is trapezoidal. Another difference lies in the caudal side of the *orbital apertura aditus*. The end of the *processus zygomaticus* that forms the lower side of the female goat's orbital aperture opening is in an inverted triangle shape (Fig 1). The end of the back part of the orbit meets the PFZ while the fore continues to become the front rostral edge of the *apertura orbitae*. The caudal edge tracing from the LPPZF to the front side of the *orbital apertura* then appears curved with the lowest point located at the front rostral corner of the *processus zygomaticus* end. In contrast to female goats, the meeting of the top side with the back side looks lower than the same point on the female goat and forms an angle. The caudal edge is straight and reaches the lowest point coincides at approximately the middle of the base of the tip triangle of the *processus zygomaticus* (Fig 2).



## Discussion

Morphometrics is a method used as one way to explain shapes through quantification (Interlocker, et al., 2017). The result of this research study showed that the PC of female goat is larger than the male goat. Research on PC is related to sexual diverse dimorphism, but the type of individual can be longer in males or vice versa even not different. (Pasiaks, et al., 2012; Oleum, 2017) (Olawumi) in references ..Check!. The difference in cranium skulls size in this study is likely due to the way cranium skull samples are found. Craniums Skulls used during the research are a collection of from the Division of Veterinary Anatomy, Faculty of Veterinary Medicine, Universitas Airlangga Surabaya. The goats obtained from in several periods and from different locations of farms whose management may be different. This results is are supported by the opinion that ka arteritis ?? Kacang goat concern morphometry such as body size and the number of births, of children kids in uniform depending on the way of maintenance (Amaravati, et al., 2017 not in references! Check ; Nafie Nafiu in references! Check , et al., 2020).

The orbital form was originally intended to identify the human race but was later developed to identify gender (Xing, et al., 2013) 2012 in references!. Patra, et al. (2021) classified the shape of the orbital apertura aperture into four: circles, ellipses, four rectangles and squares.

Quantitative analysis of orbital apertura aperture size as a tool to identify sex gets mixed results (Sreekanth and Hema, 2019; El-Farouny, et al., 2021). In this study, LPPZF and DOA (mention the measured parts not the abbreviations) in female goats were larger than in male ones. The difference is consistent in the sense that weight does not affect the difference even though it changes the magnitude.

The amount of PDA as a differentiating indicator change depending on the weighted used. If the PDA is not aerobot ? or weighted with a PC then it gets results that do not differ between the sexes, but if the PDA is weighted by DOA, then between types of PDAs. Different genders mamajuana pad ? differences. In contrast to LPPFZ which does not show a difference either without weighting or weighting with PC or DOA. This shows the consistency of measurement methods as a differentiating tool.

A review of the shape and size of the *apertura* obtained gives an idea that the meeting joining of the upper edge and the back edge in the female goat is curved. The PDA that weighted (compared) by DOA is shorter than the same variable in males, the lowest point of rear edge extension falls at approximately the front end of the *Os zygomaticus*. The measurement results found that the DOA of female goats is longer than the DOA of male goats. If connected, The orbital *apertura* aperture of female goats may observed to be in the form of ellipse or circle. This picture is in accordance with observations. (In contrast to the orbitaria aperture orbital aperture of the male goat, the duckling?? is upper side with the back side of the *apertura* lower than the female goat and slightly forms an angle) not a clear sentence. The straight caudal side with the strangest ?? point lies at approximately the middle of the *Os zygomaticus* se, then rising and leaving the angular shape.

DOA is shorter than the DOA of a female goat. This summary of information gets a suspected square-shaped orbital aperture. In the study the orbital aperture is trapezium-shaped. Differentiate information because there is no measurement of the front side of the aperture. This is because of the difficulty of determining the limit.

In correlation with that research related to morphology will get more informative results if the merger of size and shape as proposed by Janarthanan and Asha (2017). Consideration of including shapes other than measurements is morphology controlled by genes (Zichello et al., 2018; Kasimatis, et al., 2020). Morphology concerns two things: measurement and form (Casanova, 2017). The stable form is not affected by position, transition, and rescaling. Mitteroeckera, et al., 2017).2013 in references

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**Table (1).** Correlation Between Variables Observed

		PC	LPPZF	LPPFZ	PDA	DOA
PC	Pearson Correlation	1	0.64**	0.65**	0.16	0.70**
	Sig. (2-tailed)		0.00	0.00	0.51	0.00
LPPZF	Pearson Correlation	0.64**	1	0.51*	-0.09	0.43
	Sig. (2-tailed)	0.02		0.02	0.72	0.06
LPPFZ	Pearson Correlation	0.65**	0.51*	1	0.06	0.40
	Sig. (2-tailed)	0.02	0.02		0.81	0.08
PDA	Pearson Correlation	0.18	-0.09	0.06	1	0.31
	Sig. (2-tailed)	0.51	0.72	0.81		0.18
DOA	Pearson Correlation	0.70**	0.43	0.40	0.31	1
	Sig. (2-tailed)	0.01	0.06	0.08	0.18	

Correlated (p<0.05) \*\* Correlated (p <0.01)

**Table (2).** Variable Difference Analysis; Apertura Orbit aria between the Sexes

	Absolute				With weighting*			
	Female		Male		Female		Male	
	$\bar{X} \pm sd(mm)$		$\bar{X} \pm sd(mm)$		$\bar{X} \pm sd$		$\bar{X} \pm sd$	
PC	211.92 <sup>a</sup>	± 17.19	192.42 <sup>b</sup>	± 3.68				
LPPZF	12.49 <sup>a</sup>	± 1.45	9.33 <sup>b</sup>	± 1.19	0.06 <sup>c</sup>	± 0.01	0.05 <sup>d</sup>	± 0.01
LPPFZ	9.26 <sup>a</sup>	± 1.77	7.98 <sup>a</sup>	± 1.18	0.04 <sup>c</sup>	± 0.01	0.04 <sup>c</sup>	± 0.01
PDA	23.67 <sup>a</sup>	± 1.75	24.48 <sup>a</sup>	± 2.20	0.11 <sup>c</sup>	± 0.01	0.13 <sup>c</sup>	± 0.01
DOA	33.59 <sup>a</sup>	± 1.62	32.07 <sup>b</sup>	± 1.38	0.16 <sup>a</sup>	± 0.01	0.17 <sup>b</sup>	± 0.01



**Fig (1):** Cranium Skull variables measured (1. DOA; 2. LPPZF; 3 PDAs; 4 LPPFZ; 5 PCs)

It is better to write the complete feature on the fig. not the abbreviations which are long and unrememrable.



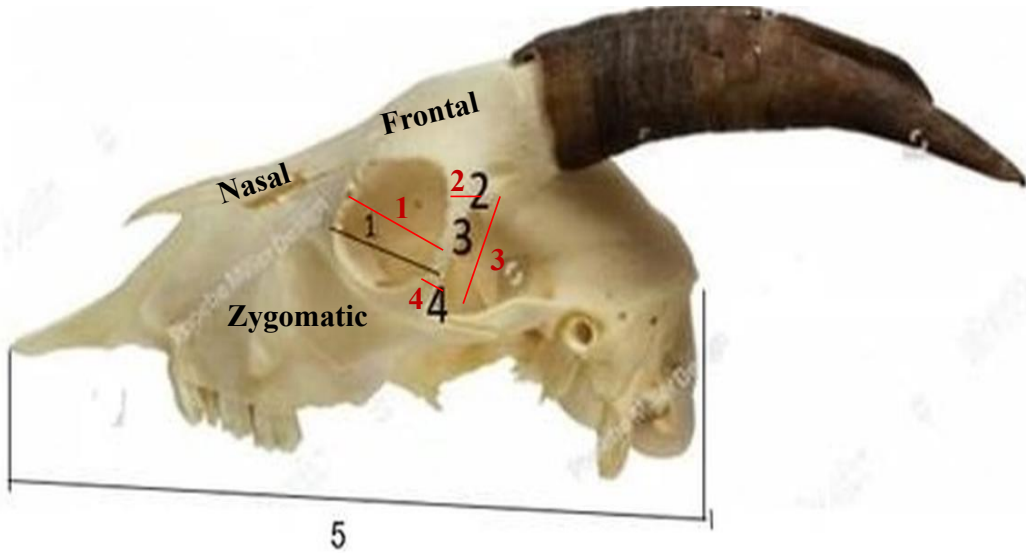
**Fig (2):** Cranium Skull of Kacang goat. On the left is the cranium skull of a female Kacang goat. In the image appears that the upper caudal wall of the orbit **aria-shaped old aper?** curves on a curved male goat while on the male goat is somewhat elbowed. The tip of the **child's arrow** head points at the lowest point from the edge of the **orbital apertura**.

### Comments:

- Authors must use the Nomina Anatomica Veterinaria (NAV) for the anatomical terms (it is found online) also they can use the “illustrated Veterinary Anatomical Nomenclature, edited by Oskar Schaller, 1992).
- The word cranium means part of the skull encloses the brain, while skull includes cranial bones and facial bones. Your work is on the orbit or orbital opening, so the word cranium is not correct.
- What is the base of choosing the measurements abbreviations!! Why it is complicated and consisting of 5 characters? It makes it hard to follow through the text.. Try to choose simple ones.
- Presentation is poor because of the long abbreviation which make the results and discussion not clear.. please use in simple way.

- Check in the references the years and the spelling (highlighted in yellow).
- Suggestion to replace the abbreviation of the measurements as follows:
  - DOA = **OW** from Orbital width
  - PC. = **SL**. From skull length (**not cranial length**)
  - LPPZF = **WZF** from width of zygomatic process of frontal bone
  - PDA = **LCRO** from length of the caudal rim of the orbit
  - LPPFZ.= **WFZ** from width of frontal process of the zygomatic
- Put this information on the plate accurately.
- Avoid strange words (may from another language) such as **mamajua-na pad**, **ka arteritis**.





- You can add more information on your fig, such as some bone names!  
N.B. Orbital width (which is called horizontal diameter in your study) is the widest part of the orbit which should be in the middle of the orbit not at its lower part as in your figure.