

# OVOZOA

## Journal of Animal Reproduction

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- Advocacy for quantitative progesterone assay in the breeding management of bitches**  
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## JOURNAL HISTORY

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Based on the decision of Asosiasi Departemen Reproduksi Veteriner Indonesia (ADERVI) or the Indonesian Association of Department of Veterinary Reproduction (IADV) meeting on December 11<sup>th</sup>, 2019 in Surabaya, the publication of the OVOZOA e-journal starting in 2020 in collaboration with ADERVI. The Memorandum of Agreement between the Dean of the Faculty of Veterinary Medicine, Universitas Airlangga and the Chairperson of ADERVI, Number (FKH unair): 1445/UN3.1.6/KS/2020 and Number (ADERVI): 04/ADERVI/V/2020 signed on May 4<sup>th</sup>, 2020. Since March 27<sup>th</sup>, 2021 OVOZOA Journal of Animal Reproduction has also collaborated with the Indonesian Animal Reproduction Association (Asosiasi Reproduksi Hewan Indonesia, ARHI). Starting from Volume 9 – 2020, OVOZOA completes its name as the OVOZOA Journal of Animal Reproduction. It contains the publication of scientific work of lecturers, researchers, and practitioners of ADERVI members in the field of Veterinary Reproduction and Animal Reproduction Biotechnology. Ovozoa Journal of Animal Reproduction is published at <https://e-journal.unair.ac.id/OVZ/index> periodically three times a year: April, August, and December.

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# OVOZOA

## Journal of Animal

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Original article

## Determination of sexual maturity of Indonesian box turtle (*Cuora amboinensis couro*) based on straight carapace length

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### ABSTRACT

Predicting the turtle's reproductive status and sexual maturity is necessary for ex-situ breeding and conservation program. The histology of the seminiferous tubules of the Indonesian box turtle (*Cuora amboinensis couro*) at various ages has not been studied much. This study aims to develop equations to predict the sexual maturity of Indonesian box turtles based on straight carapace length (SCL). Six turtles with SCL sizes 10-21 cm were sacrificed and their testes were taken for morphometric measurements and histological preparations for Hematoxylin Eosin staining. Pearson's correlation of SCL with testicular maturity parameters was analyzed, followed by Anova Regression. The results showed that there were differences in the morphometry and topographic anatomy of the Indonesian box turtle testes between SCL below 15 cm and above 15 cm. Six turtles with SCL size of 10-21 cm were sacrificed and their testes were taken for morphometric measurements and histological preparations for Hematoxylin Eosin staining. Pearson's correlation of SCL with testicular maturity parameters was analyzed, followed by Regression Anova. The results showed that there were differences in the morphometry and topographic anatomy of the Indonesian box turtle testes between SCL below 15 cm and above 15 cm.

**Keywords:** endangered species, Indonesian box turtle, seminiferous tubules, spermatogenic cells, testes

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### INTRODUCTION

The Indonesian box turtle is one of the native Indonesian turtles which is hunted to meet export and domestic needs (Qayyim, 2018). These turtles were mainly used as pets, meat and eggs for food consumption, traditional Chinese medicine, handicrafts and

traditional purposes (Wang and Carey, 2014). The Indonesian box turtle was listed in appendix II (CITES, 2019) and is not protected by the Indonesian government (Nurbaya, 2018) but has been categorized as endangered in 2020 by the IUCN (Cota *et al.*, 2020). There were indications of over-exploitation of Indonesian box turtles in the

long term (Widagti, 2011; Fauzi, 2022).

Turtles grew very slowly, it took four to ten years to reach sexual maturity, and the female usually laid only 2-4 eggs at a time (Tagunu *et al.*, 2018). The growth and reproductive rate of the Indonesian box turtle was relatively slow compared to the invasive Red Eared Slider (*Trachemys scripta elegans*), which could lay up to 30 eggs a year (GISD, 2021). Males reach sexual maturity at a carapace length of 13 cm (Schoppe and Das, 2011) with a slightly more concave plastron, longer, thicker tail, and larger claws when mature (Barbour and Ernst, 1995).

More information is needed about turtle reproduction, especially about the peak of turtle reproduction, to maintain turtle populations through ex-situ breeding program. Studies on male reproduction of Indonesian box turtle are still rare. The gross anatomy of the reproductive organ of mature Indonesian box turtles has been studied (Ruyani *et al.*, 2007). However, the histology of the seminiferous tubules of Indonesian box turtles of various ages has not been studied. The age of wild-caught turtles could be determined by the straight carapace length (SCL) as a standard measure. The SCL consisted of the distance from the notch of the nuchal scute to posterior most scute tip (Kobayashi *et al.*, 2010). Therefore, this study aims to determine the sexual maturity of Indonesian box turtle based on straight carapace length (SCL).

## MATERIALS AND METHODS

This study was approved by the Animal Care and Use Committee, Faculty of Veterinary Medicine, Universitas Airlangga, Surabaya, Indonesia (No. 2.KE.051.07.2020). Six Indonesian box turtles with different SCL sizes were purchased from the reptile market in Surabaya. Turtles were sexually dimorphic; the male has a longer, thicker tail and concave plastron (Tiar-Saadi *et al.*, 2022).

### Necropsy and sample collection

The first author has been trained in an exotic animal necropsy workshop. The turtles were euthanized using the chloroform per-

inhalation method, then decapitated using a sharp blade (McArthur *et al.*, 2004). The testes were collected to measure diameter (cm) and weight (grams) measurement and stained histological preparations with Hematoxylin Eosin. The histological slides were evaluated under a light microscope (Nikon H600L equipped with Nikon Coolpix camera and Optilab) at 400x magnification. Tubular diameter and spermatogenic cell count were measured for five fields of view on each slide, then averaged.

### Data analysis

The normality of parameter distribution was analyzed using Kolmogorov-Smirnov. Pearson correlation of SCL to testicular weight, testicular diameter, seminiferous tubules diameter, and spermatogenic cell count was analyzed using Regression Anova. All data analyses used Statistical Product and Service Solutions (SPSS) software version 23 for Windows at a 95% of confidence level.

## RESULTS

Gross anatomy of the reproductive system of male Indonesian box turtles showed testes, epididymis, urinary bladder, kidneys, and hemipenis (Figure 1). Anatomical topography of the Indonesian box turtle showed testes, kidneys, and urinary bladder (Figure 2). Histological testes of Indonesian box turtle showed the seminiferous tubules and the spermatogenic cells comprised of spermatogonia, spermatocytes, and spermatids (Figure 3).

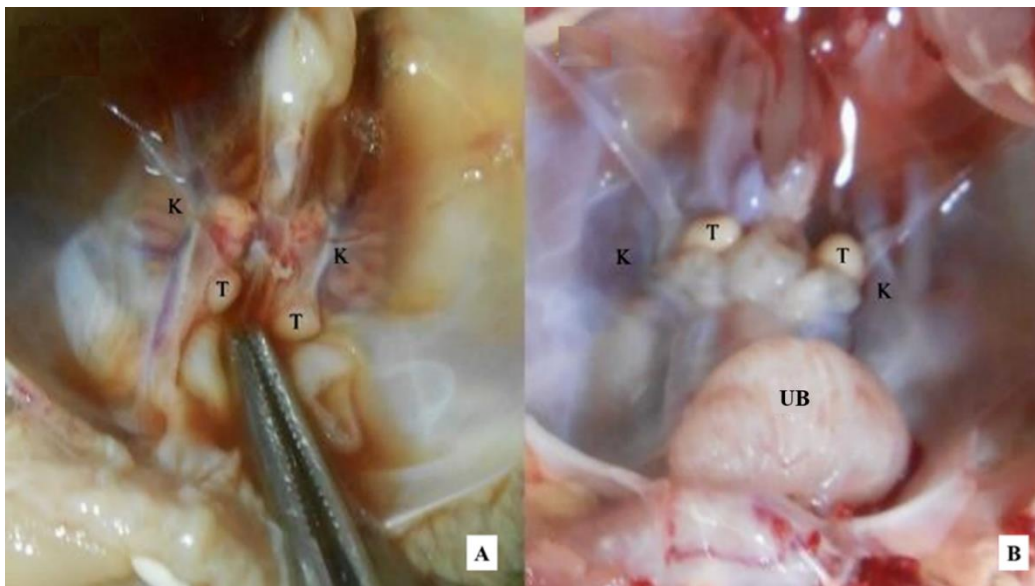
The data distribution of SCL, testicular diameter, testicular weight, tubular diameter, and spermatogenic cell count were normal ( $p > 0.05$ ). The results showed the weight and diameter of the left and right testes (Table 1), as well as the number of spermatogenic cells and the diameter of the seminiferous tubules (Table 2) of Indonesian box turtles based on SCL size. There was a significant correlation ( $p < 0.05$ ) of SCL with testicular weight, testicular diameter, seminiferous tubule diameter, and spermatogenic cell count (Figure 4). There was a significant ( $p < 0.05$ ) regression equation of testicular weight (TW), testicular diameter

(TD), seminiferous tubule diameter (STD), and spermatogenic cell count (SCC) based on

straight carapace length (SCL) as predictors (Table 3).



**Figure 1** Gross anatomy of the male Indonesian box turtle reproductive system (17.5 cm straight carapace length, SCL); T: Testes; E: epididymis; UB: urinary bladder; K: kidney; HP: hemipenis



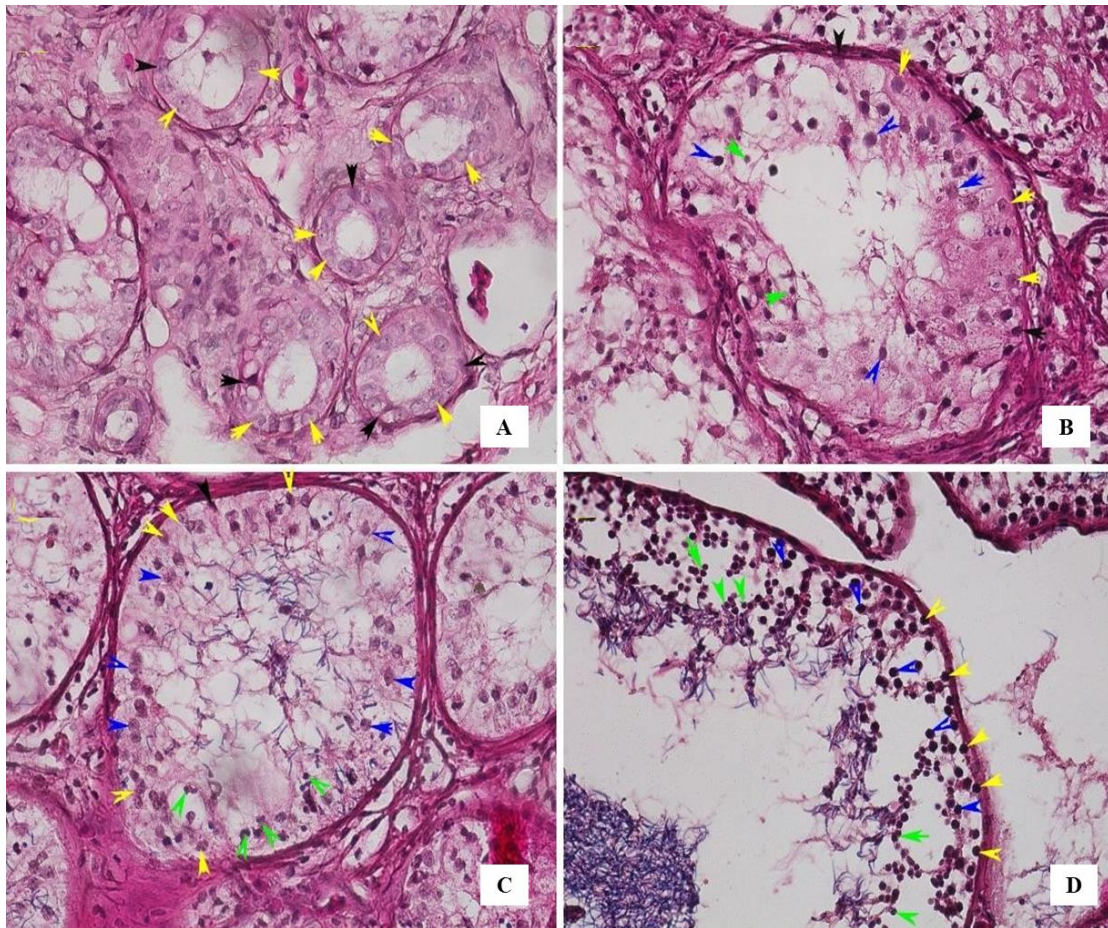
**Figure 2** Anatomical topography of the Indonesian box turtle; A: 10 cm straight carapace length (SCL); B: 15 cm SCL; T: testes; K: kidney; UB: urinary bladder.

**Table 1** Testicular weight and testicular diameter of Indonesian box turtle based on straight carapace length (SCL) size

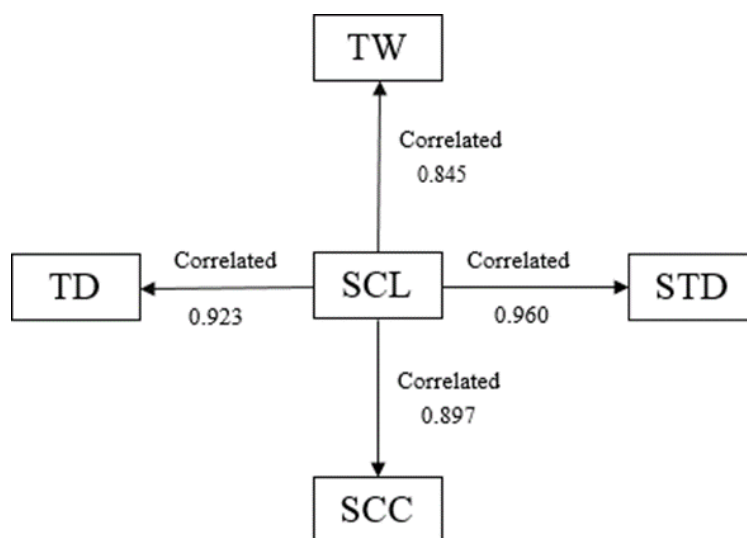
SCL (cm)	testicular weight (gram)		testicular diameter(cm)	
	left	right	left	right
10	0.04	0.05	0.38	0.35
12.5	0.08	0.07	0.42	0.40
15	0.12	0.12	0.59	0.65
17.5	0.21	0.17	0.83	0.90
19	0.37	0.28	1.49	0.97
21	0.75	0.72	1.62	1.65

**Table 2** Spermatogenic cell count and seminiferous tubule diameter of Indonesian box turtle based on straight carapace length (SCL) size

SCL (cm)	spermatogenic cell count		seminiferous tubules diameter (cm)	
	left	right	left	right
10	43.1	37.9	6.9	8.6
12.5	58.7	47.9	8.9	9.3
15	116.6	133.7	51.2	51.2
17.5	142.9	131.6	46.8	47.0
19	238.7	213.7	67.2	80.4
21	258.1	266.6	178.8	165.6



**Figure 3** Spermatogenic cells in the seminiferous tubules of the Indonesian box turtles based on straight carapace length (SCL); A: 12.5 cm SCL; B: 15 cm SCL; C: 17.5 cm SCL; D: 21 cm SCL; showing spermatogonia (yellow arrows), spermatocytes (blue arrows), spermatids (green arrows), and Sertoli cells (black arrows); Hematoxylin Eosin staining preparations under a light microscope (Nikon H600L) with 400x magnification.



**Figure 4** Pearson correlation of straight carapace length (SCL) with the testicular weight (TW), testicular diameter (TD), seminiferous tubule diameter (STD), and spermatogenic cell count (SCC); the numbers indicated the coefficient of correlation (r) ( $p < 0.05$ ).

**Table 3** Regression equations as SCL based predictors for testicular weight, testicular diameter, seminiferous tubule diameter, and spermatogenic cell count

parameters	equation	p-value	R2 (%)
TW	-0.59 + 0.05 SCL	0.001	0.714
TD	-0.96 + 115.00 SCL	0.003	0.852
STD	-189.91 + 20.89 SCL	0.000	0.922
SCC	-120.02 + 11.10 SCL	0.002	0.805

TW: testicular weight; TD: testicular diameter; STD: seminiferous tubules diameter; SCC: spermatogenic cell count; SCL: straight carapace length.

## DISCUSSION

The testicular morphology of Indonesian box turtles with SCL sizes of 10 cm and 12.5 cm were spheroid in shape and more translucent in color. These results were in line with the results of a study on the morphological description of immature Magdalena River turtle (*Podocnemis lewyana*) (Sanchez-Ospina et al., 2014). However, it was different from the mature turtles that were spread on Central Sulawesi (*Cuora amboinensis*, *Leucocephalon yuwonoi*, and *Indotestudo forstenii*) which were ovoid in shaped and yellowish in color (Tagunu et al., 2018). The topographic anatomy study showed that testes was not always located on the anterior parts of the kidney, as theorized by Radiopoetra (1991). In this study, testes were on the posterior side of the kidney at 10 cm and 12.5 cm SCL sized turtles. Testicular diameter in this study varied between 0.35-1.65 cm and correlated with SCL sizes. This result was in line with the correlation between turtle SCL size and testicular diameter of immature green turtle (*Chelonia mydas*) (Otsuka et al., 2012). Variation in the size of the adult testis could be caused by the environment. SCL could distinguish adults from juvenile *Lepidochelys kempii* sea turtles (Craven et al., 2019). It was expected that developmental variations in the turtle would be useful for phylogenetic studies and distinguishing the reproductive status of turtle species (Olukole et al., 2018). For example, the testis of the African sideneck turtle (*Pelusios castaneus*) were attached to the peritoneal wall posterior to the ventrolateral kidney. The testes were yellow, smooth and ovoid in shape (Olukole et al., 2014).

Meanwhile, the testes of *Trachemys scripta elegans* turtle were oval in shape, bright yellow in color, and were located cranially to the epididymides and caudally to the kidneys (Gradela et al., 2019).

The testicular histological features also differ based on the SCL size of the Indonesian box turtle. The differences were mainly in the diameter of the seminiferous tubules and the interstitial tissue between the tubules. These differences have been categorized into six stages based on the feature of interstitial tissue and the degree of widening of the seminiferous tubules in *Chelonia mydas*. Testes categorized in the first stage had indistinct seminiferous tubules with no luminal spaces. In the second stage, each seminiferous tubule had a luminal space and became distinguishable from the interstitial tissue, which contained Leydig cells with many lipid droplets. Interstitial connective tissue began to develop in the third stage, and Leydig cells with fewer lipid droplets than those in the second stage gathered closer and formed clusters. In the fourth stage, the interstitial connective tissue showed an edematous change and contained Leydig cells with fewer lipid droplets than in the third stage. In the fifth stage, widening in seminiferous tubules and reduction in interstitial connective tissue were seen. In the sixth stage, seminiferous tubules were further expanded, and interstitial connective tissue was only observed in the small spaces among the tubules (Otsuka et al., 2012). The seminiferous of *Trachemys scripta elegans* turtle comprised of Sertoli and spermatogenic cells, while Leydig cells in the interstitial tissue surrounding the seminiferous tubules (Gradela et al., 2019).



There was a correlation between the SCL of turtles and the number of Spermatogenic cell. The process of spermatogenesis differed based on the size of the SCL. The process of spermatogenesis was divided into some stages. In the first stage, the seminiferous tubule had a single layer of Sertoli cells lining the epithelium with spermatogonia interspersed. In the second stage, spermatogonia proliferated until it became several layers in the seminiferous tubule. In the third stage, several cell layers of primary spermatocytes began to appear. In the fourth stage, the seminiferous tubules have more primary than secondary spermatocytes, also spermatozoa and spermatid. In the fifth stage, the secondary spermatocytes became more abundant, with fewer primary spermatocytes. In the sixth stage, seminiferous tubules appear with primary spermatocytes, abundant secondary spermatocytes, spermatids, and a lumen full of spermatozoa (peak of spermatogenesis). In the seventh stage, there were fewer spermatids, more spermatozoa with a mixture of debris clumping in the center of the lumen and the appearance of clearing out of spermatozoa (Olukole *et al.*, 2013). Previous study reported that the SCL in the sexual maturity of male Indonesian box turtles was different compared to male Indonesian box turtles which reached sexual maturity at 13 cm (Schoppe and Das, 2011). However, in this study, based on the histology of the seminiferous tubules, male Indonesian box turtles began to mature sexually at 15 cm SCL size, marked by widening of the seminiferous tubule diameter and the development of spermatogenic cells, and spermatozoa began to appear at 17.5 cm SCL sizes. The difference in size at maturity was also reported in Loggerhead Turtles (*Caretta caretta*) between the north and south pacific (Ishihara and Kamezaki, 2011).

Spermatogenesis in turtles was influenced by many factors, and the spermatogenic cycle was an intrinsic factor. Spermatogenesis in turtles was described as one of three patterns: prenuptial, postnuptial (dissociated pattern), and acyclic. In the prenuptial pattern, spermatogenesis immediately precedes mating. In postnuptial spermatogenesis,

spring mating used spermatozoa produced in the previous summer and stored in the epididymides over winter during a sexually quiescent phase. While, in the acyclic, spermatogenesis was a continual production of spermatozoa without a defined peak or quiescence (Chaves *et al.*, 2017). Environmental factors have also been observed to impact spermatogenesis (Marn *et al.*, 2017). The spermatogenic cycle of the African sideneck turtle (*Pelusios castaneus*) was a pattern of the postnuptial spermatogenesis based on samples collected at different times (Olukole *et al.*, 2014).

SCL size of the Indonesian box turtle had a robust positive correlation ( $r = 80-100$ ) to all parameters in this study. A correlation coefficient ( $r$ ) of 0.80-1.0 meant a robust correlation (Sen and Srivastava, 2011; Rouaud, 2017). Our findings showed that testicular weight, testicular diameter, seminiferous tubule diameter, and spermatogenic cell count could be predicted based on the straight carapace length of the Indonesian box turtle (*Cuora amboinensis couro*). The correlation between SCL and testicular length and histology concluded that SCL was a significant predictor of the reproductive state of Kemp's Ridley Sea turtle (*Lepidochelys kempii*) (Craven *et al.*, 2019).

## CONCLUSION

The size of the SCL correlated strongly with the parameters of the primary reproductive organ development of the Indonesian box turtles (*Cuora amboinensis couro*). In the mature Indonesian box turtle (*Cuora amboinensis couro*), the SCL reached 15 cm. Therefore, these findings could be used to predict the reproductive status and sexual maturity of sea turtles for ex-situ captive and conservation programs.

## REFERENCES

- Barbour R, Ernst C. 1995. Turtles of the World. Smithsonian Institute Press. 280.  
Chaves MF, de Moura GJ, Tenório FDC, Baptista JDS, Lapa CJ, Teixeira VW,

- Teixeira AA. 2017. Influence of rainfall and temperature on the spermatogenesis of *Leptodactylus macrosternum* (Anura: Leptodactylidae). *Zoologia* 34: 1-7.
- CITES (Convention on International Trade in Endangered Species) of Wild Fauna and Flora, 2019. Appendices I, II, III. 44.
- Cota M, Hoang H, Horne BD, Kusrini MD, McCormack T, Platt K, Schoppe S, Shepherd C. 2020. Cuora amboinensis. The IUCN Red List of Threatened Species 2020. 1.
- Craven KS, Hodgson JYS, Shaver DJ, Walker JS, Villalba-Guerra MR, Owens DW. 2019. Evaluation of Gonadal Tissue to Validate Size at Reproductive Maturity in Kemp's Ridley Sea Turtles Found Stranded in Texas, USA. *Diversity* 11: 76.
- Fauzi MA. 2022. A Recent Harvest Monitoring of Cuora amboinensis in Sumatra and Kalimantan. *Indones J Environ Sust Dev.* 12: 5-13.
- GISD (Global Invasive Species Database). 2021. Species profile: *Trachemys scripta elegans*. <http://www.iucngisd.org/gisd/04-02-2021>.
- Gradela A, Pires IC, Faria MD, Matos MHT, Costa MM, Souza RKC, Milanelo L, Franzo VS. 2019. Morphology and biometry of the reproductive organs of adult males of *Trachemys scripta elegans* reared in São Paulo state, Brazil. *Pesq Vet Bras.* 39: 538-48.
- Ishihara T, Kamezaki N. 2011. Size at Maturity and Tail Elongation of Loggerhead Turtles (*Caretta caretta*) in the North Pacific. *Chelonian Conserv Biol.* 10: 281-7.
- Kobayashi M, Shimizu T, Okuzawa K, Soyano K, Yoseda K. 2010. Determination of Maturity in Male Hawksbill Turtle *Eretmochelys imbricata* in Captivity Based on Tail Elongation and Plasma Testosterone Level. *Fish Sci.* 76: 777-84.
- Marn N, Jusup M, Legović T, Kooijman SALM, Klanjšček T. 2017. Environmental effects on growth, reproduction, and life-history traits of loggerhead turtles. *Ecol Modell.* 360: 163-78.
- McArthur S, Wilkinson R, Meyer J. 2004. Medicine and surgery of tortoises and turtles. Blackwell. Denmark. 579.
- Nurbaya S. 2018. Peraturan Menteri Lingkungan Hidup dan Kehutanan Republik Indonesia Nomor: P.20/Menlhk/Setjen/Kum.1/6/2018. Tentang Jenis Tumbuhan dan Satwa yang Dilindungi.
- Olukole SG, Madekurozwa M-C, Oke BO. 2018. Spermiogenesis in the African sideneck turtle (*Pelusios castaneus*): Acrosomal vesicle formation and nuclear morphogenesis. *J King Saud Univ Sci.* 30: 359-66.
- Olukole SG, Olubenga OM, Olusiji OB. 2014. Anatomy of the Male Reproductive Organs of the African Sideneck Turtle. *Anat J Afr.* 3: 380-5.
- Olukole SG, Oyeyemi MO, Oke BO. 2014. Biometrical and histometrical observations on the testis and epididymis of the African sideneck turtle (*Pelusios castaneus*). *Eur J Anat.* 18: 102-8.
- Olukole SG, Oyeyemi MO, Oke BO. 2013. Spermatogenic Cycle of the African Sideneck Turtle *Pelusios castaneus* (Schweigger, 1812) (Reptilia: Testudines). *Ital J Zool.* 81: 25-31.
- Otsuka S, Suzuki M, Kamezaki N, Shima T, Wakatsuki M, Kon Y, Ohtaisi N. 2008. Growth-Related Changes in Histology and Immunolocalization of Steroid Hormone Receptors in Gonads of Immature Male Green Turtle (*Chelonia mydas*). *J Exp Zool.* 309A: 166-74.
- Qayyim DI, 2018. Perdagangan dan Pemanfaatan Kura-Kura di Palu, Sulawesi Tengah dan Sekitarnya. Prosiding Seminar Nasional Konservasi dan Pemanfaatan Tumbuhan dan Satwa Liar. Pusat Penelitian Biologi, Lembaga Ilmu Pengetahuan Indonesia. 27 November 2018. 473-482.
- Radiopoetra R, Suharno S, Shalihudin DT, Susilo HS, Harminani SDD, Aliusodo M. 1991. Zoologi. Erlangga. Jakarta.
- Rouaud M. 2017. Probability, Statistics, and Estimation. Creative Commons Attribution-Non Commercial 4.0. International License (CC BY-NC 4.0), London. 58-68.

- Ruyani A, Karyadi B, Novianti E. 2007. Studi Anatomi organ Reproduksi Kura-Kura Garis Hitam (*Cyclemys oldhamii*) dan Kura-Kura Patah Dada (*Cuora amboinensis*). Seminar Herpetologi Indonesia. Bogor 26-27 Mei 2007. 4-18.
- Sanchez-Ospina AC, Rodriguez B, Ceballos CP. 2014. Histological description of the reproductive system of male and female hatchlings of the Magdalena river turtle (*Podocnemis lewyana*). Acta Biol Colomb. 19: 427-35.
- Schoppe S, Das I. 2011. *Coura amboinensis* (Riche *in* Daudin 1801) Southeast Asian box turtle. chelonian study monographs No. 5. 1-9.
- Sen A, Srivastava M. 2011. Regression analysis theory, methods, and applications. Springer-Verlag. Berlin. 64-6.
- Tagunu NFT, Fahri F, Annawaty A. 2018. Characteristics on Spermatozoa of Several Turtles Species (Testudinata) from Central Sulawesi. Nat Sci J Sci Technol. 7: 9-22.
- Tiar-Saadi M, Tiar G, Bouslama Z, Široký P. 2022. Mechanisms determining body size and shape difference in Algerian spur-thighed tortoises (*Testudo graeca*). Animals 12: 1330.
- Wang DQ, Carey MC. 2014. Therapeutic uses of animal biles in traditional Chinese medicine: an ethnopharmacological, biophysical chemical and medicinal review. World J Gastroenterol 20: 9952.
- Widagti N. 2011. Sustainability of turtle harvesting *Cuora amboinensis* Daudin 1802 (Testudines: Geomydidae) in exploited area, East Borneo. Widyariset 14: 367-74.

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OVOZOA Journal of Animal Reproduction is a journal that contains scientific articles on animal reproduction and animal reproductive biotechnology published by the Department of Veterinary Reproduction of Airlangga University together with the Association of the Indonesian Veterinary Reproduction Department (ADERVI) 3 times per year on April, August and December. OVOZOA received manuscripts in the form of original research articles, review articles and case reports in Indonesian and English. Manuscripts received must be original, current and have never been published or are being planned to be published in other scientific journals.

Manuscripts must be submitted online through the Open Journal System (OJS) in Word format. The entire text is typed in Times New Roman 12pt double spaced, using line numbers. The title is written with a Sentence case capitalization (bold, 14pt, centered). The full length of the manuscripts is a maximum of 15 pages of A4 paper with a top margin of 2.2 cm, other margins of 2 cm, and consecutive page numbers. Italicize only for species names or terms that have not been standardized as Indonesian. Define abbreviations upon first appearance in the text. Do not use non-standard abbreviations unless they appear at least three times in the text. Keep abbreviations to a minimum. Avoid unnecessary duplication of text.

The first page contains titles in Indonesian and English, followed by full names of all authors without titles and initials (bold, centered), followed by the name and complete address of the respective institution (marked with numeric superscripts) and e-mail of corresponding authors (marked with \*superscript).

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**Tables** are made without vertical lines (use only lines at the top and bottom of the table as well as for separating heading from the main table), with table title placed before the table, numbered in Arabic numerals (**Table X**), and have to be referred in the text. The description of the table is placed after the table; it must be concise but clear enough so that the table separately can be understood without referring to the text. The table along with the title and description are placed after the References.

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**Approval of Ethical Commission** have to be stated (number and institution) if the manuscript is constructed based on a research using live animals.

**Acknowledgements** are delivered to the research funders (state the name, number and recipient name of the grant, if applicable), and to those who have helped carry out the research.

**References** are sorted alphabetically based on the author's last name. The *titles of journals* should be *abbreviated* according to the style used by each journal. Thirty (30)% of the references have to be from publications in the past 10 years.

### Journals

Nakamura K, Kusama K, Ideta A, Imakawa K, Hori M. 2020. IFNT-independent Effects of Intrauterine Extracellular Vesicles (EVs) in Cattle. *Reproduction* 159: 503-11.

Windeyer MC, Gamsjager L. 2019. Vaccinating Calves in the Face of Maternal Antibodies:

Challenges and Opportunities. *Review Vet Clin North Am Food Anim Pract.* 35: 557-73.

### Books

Gordon I. 2003. *Laboratory Production of Cattle Embryos*. 2nd Ed. CABI Publishing. UK

### Chapter in books

Parkinson TJ, Vermunt Jos J, Noakes DE. 2019. Maternal Dystocia: Causes and Treatment. In: Noakes DE, Parkinson TJ, England GCW (Ed). *Veterinary Reproduction and Obstetrics*. 10th Ed. Elsevier, UK. 236-49.

### Thesis/Dissertation

Utama S. 2012. *Monitoring and Assessment of Nuclear Transfer Pregnancies using Maternal*

*Pregnancy Recognition Proteins*. PhD. Thesis. Monash University. Melbourne, Australia.

### Internet

Akhir N. 2020. Title of article from the internet. <http://www.link>. access date.

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Ovozoa receives quality and interesting case reports with topics included in the scope of this journal. All reports are peer reviewed as is applied for original articles. All instructions are the same as for the original articles.

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Manuscript reviews for publications in the OVOZOA Journal of Animal Reproduction (hereinafter referred to as OVOZOA) are carried out by peer reviewers in a double-blind review. The chief editor handles all correspondence with the corresponding author and the reviewer, and leads the final decision on whether the manuscript is recommended to be accepted, rejected, or needs to be returned to the corresponding author for revision. The corresponding author will automatically receive a confirmation email after successfully submitting the manuscript through OJS.

The chief editor and editors will evaluate the manuscripts submitted at the prequalification stage based on the format suitability and substance qualifications. If there is a format discrepancy, the manuscript will be sent back to the corresponding author to be rewritten under the OVOZOA format. However, if there is a discrepancy in substance qualifications (not included in OVOZOA focus and scope), the manuscript is rejected without further review. The decision will change the status of the manuscript in the OJS. The chief editor will notify the corresponding author about the decision.

Manuscripts that pass the prequalification will be evaluated by two or three reviewers determined by the chief editor and editors. The chief editor will send the manuscript to reviewers via email and OJS. The reviewers answer whether they would like to review the manuscript directly via email or through OJS. The reviewers check the manuscript based on predetermined criteria and returns it with recommendations to the chief editor via email or OJS. If one reviewer recommends being accepted and another reviewer recommends being rejected, then the chief editor will ask the third reviewer or three editors to decide on the acceptance or rejection of the manuscript.

The assessment results from the peer reviewers will be consolidated by two editors who match their expertise to make a decision.

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