

Morphometric Characteristics Of Tuntong Laut (*Batagur Borneoensis*) Various Ages Found In Aceh Tamiang

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Abstract

*Morphometric measurements of the Tuntong Laut (*B.borneoensis*) are essential for identification purposes, estimating age, and determining growth rates that are influenced by habitat conditions. This study aims to evaluate the morphometric characters of various generations of sea tails found in several rivers in Aceh Tamiang (Iyu River and along the Tamiang River, Aceh Tamiang Regency). This research is descriptive exploratory research with survey and interview methods. Morphometric measurements of the young age were carried out on hatchlings that were successfully hatched at the Satucita Lestari Foundation information house. Morphometric measurements of adult individuals were carried out on individuals who were caught using traps. Research activities were carried out in August 2019. The measured morphometric characters included carapace length, carapace width, plastron length, plastron width, body height, head circumference, body weight, tail length, foreleg length, and hind leg length. Based on the morphometric measurements of adult females and males, there is a significant difference in size. Meanwhile, morphometric measurements for hatchlings aged seven months (20 individuals), 1.5 years (14 individuals), and two years (4 individuals) had a more excellent value and had an effect on the increasing age of hatchlings.*

Keyword: Ages, Morphometric, Hatchlings, Tuntong Laut

1. INTRODUCTION

Tuntong Laut or Painted Terrapin (*Batagur borneoensis*) is a type of turtle and is a reptile animal that has a carapace on the dorsal and plastron on the ventral part. Can use the morphology of the head, feet, the character of the carapace and plastron shield pieces as characteristics of turtles (Kendrick & Ades, 2009; Whiting, 2002). Turtles in the world are estimated to be 285 species. They are divided into 14 families (van Dijk et al., 2014) and live in several types of habitats such as oceans, rivers, swamps, forests, and grasslands (Ferronato et al., 2011). The results of the study of the *Geoemydidae* family, subfamily *Bataguridae*,

genus: *Batagur* from the phylogenetic and morphological aspects of 27 *Batagur*, *Callagur*, and *Kachuga* specimens (Le et al., 2007), in conjunction with (Praschag et al., 2007) using mitochondrial DNA sequences to examine the relationship between species classified into the *Batagur* genera, so it is known as *Batagur borneoensis*.

The distribution of *B. borneoensis* in the world is only in Southeast Asia from South Thailand to Kalimantan (Indonesia) (Dunson & Moll, 1980; Effendy, 2007). The population record on the island of Sumatra, namely Aceh Tamiang, Aceh Province. In the local language, it is known as the Tuntong Laut, which is one of the most endangered turtles (IUCN, 2008) due to increased community activities such as cutting mangroves for agricultural land clearing, plantations, and water transportation. The natural habitat of Tuntong Laut is the Tamiang River, where mangroves are specially Berembang (*Sonneratiacaseolaris*). The sustainability of the Tuntong Laut depends on the conditions of the spawning grounds, the preservation of the mangrove ecosystem, and the requirements of the river (Hernawan et al., 2019). The uniqueness of *B. borneoensis* when compared to *B. affinis* and *baska*, has a specific behavior for immigrating from freshwater to saltwater to reach the coast during the spawning season (Dunson & Moll, 1980). Morphological characteristics of Tuntong Laut have webbed toes, the pelvic girdle articulates with the plastron, and the neck can pull vertically. Morphometric measurements of the Tuntong Laut (*B. borneoensis*) are essential for identification, estimate age, and determine growth rates as influenced by habitat conditions.

2. METHODS

Research location

This research is a descriptive exploratory survey method. The survey method was carried out to determine the area where the traps were placed in capturing adult Tuntong Laut (male and female), namely along with the Tamiang River and Iyu River, Aceh Tamiang District, Aceh Province (Figure 1).

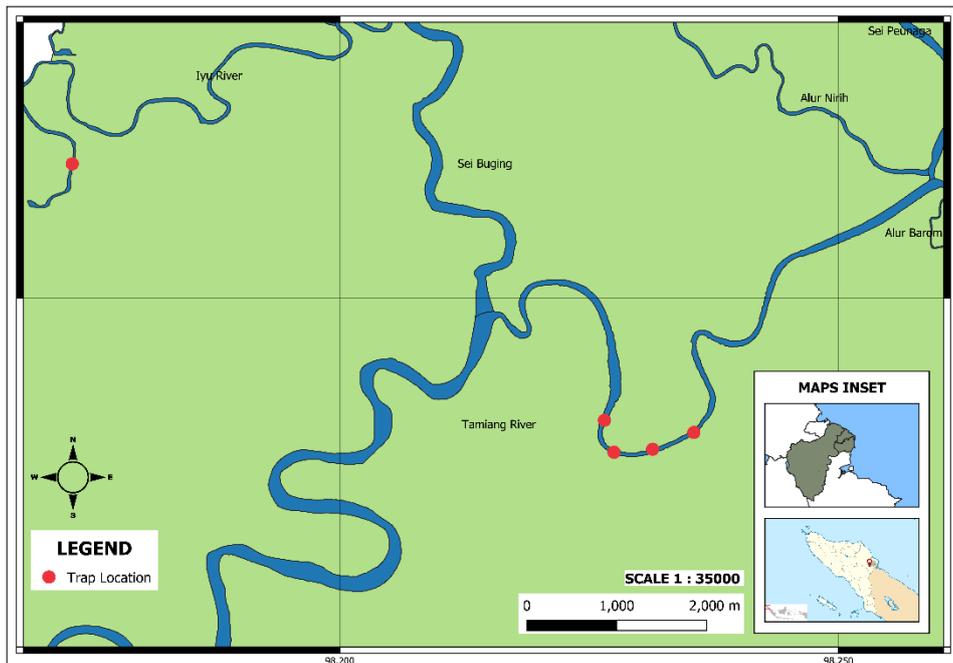


Figure 1. Locations of trapping in the Iyu River and the Tamiang River for adult Tuntong Laut(male and female)

3. TOOL TO CAPTURE

The trap used is 120 cm long, 60 cm wide, and 50 cm high, and has a mouth size of 6.5 - 12 cm(Mali et al., 2014). The trap used has been modified to suit the river conditions (Figure 2). Location laying traps in areas that are often seen painted terrapin for foraging and time often come to the surface to bask in the branches of a tree that fell into the river.

4. MORPHOMETRIC MEASUREMENTS

Morphometrics measured for adults and young age includes carapace length, carapace width, length of the plastron, the width of the plastron, height, head circumference, body weight, size of the tail, and length of the front and hind legs. Morphometric measurement painted terrapin adults (male and female), conducted on Tuntong Laut were found. Morphometric measurements carried out on the young age of hatchlings that successfully hatched at home Satucita Lestari Foundation information.

Measurements of *carapace length*, *carapace width*, *plastron length*, adult *plastron width* and young age were carried out linearly because it was more accurate and precise (Figure 3) included in the measurement of a *tail*, *head* and (*leg*) *length*. Young body weight is done with digital scales in units of grams (gr), while for the measurement of body weight, adult Tuntong Laut is weighed using a weight scale in kilograms (kg) with a capacity of 50 kg. The morphometric data were recorded in the *tallysheet* provided, and then the t-test was performed to obtain the average value and standard deviation. For biplot analysis, *Principal Components Analysis* (PCA) was carried out to determine growth based on the age of hatchlings and adult TuntongLaut.



Figure 2. Trapping equipment for capturing adult Tuntong Laut (male and female)

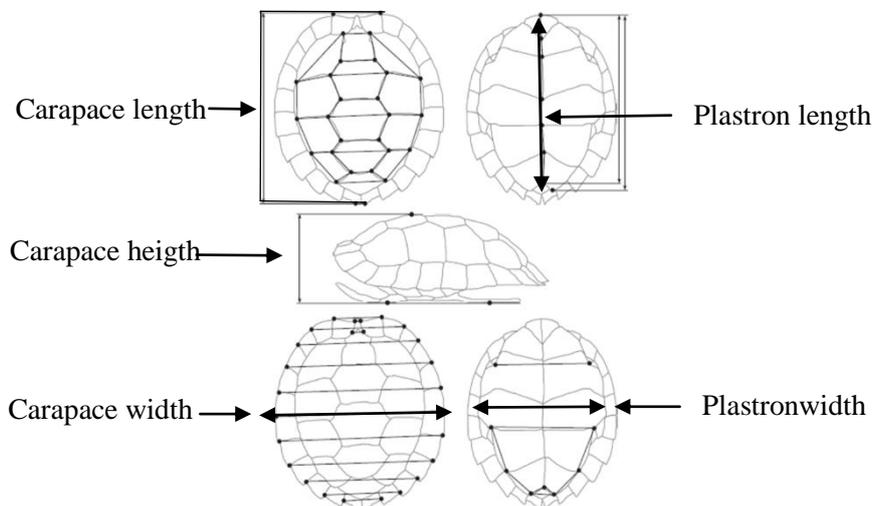


Figure 3. Measurement of carapace length, width, plastron length, width and height(Rivera, 2008; Schoppe, 2009)

5. RESULT AND DISCUSSION

Based on the data shown in table 1, morphometric measurements of hatchlings were carried out on hatchlings aged seven months (20 individuals), 1.5 years (14 individuals) and two years (4 individuals). Morphometric measurement results for Tukik aged seven months with an average carapace length of 6.2 cm, carapace width 6.2 cm, height 2.5 cm, plastron length 5.6 cm, plastron width 6.1 cm and body weight 40.8.gr. The results of morphometric measurements of hatchlings aged 1.5 years mean carapace length 9.5 cm, carapace width 9 cm, body height 3.8 cm—plastron length 8.4 cm, plastron width 8.9 cm, weight 151.9 gr. Whereas for hatchlings aged 2 years, the average carapace length is 12.1 cm, carapace width is 15.4 cm, height is 5.3 cm, plastron length is 14.1 cm, plastron width is 14.3 cm, average body weight is 698 gr.

The results were obtained from 9 individual females who were under five years old. Individuals under five years of age were taken from captivity at the TuntongLaut information house that had been successfully hatched. Six adult females aged more than five years and

also one adult male was obtained from traps in the Tamiang and Iyu Rivers. Based on the measurement, there is a difference in morphometric size between individual females under five years of age with adult females over five years and adult males. The morphometric size of individual females under five years of age has an average carapace length of 24.9 cm, carapace width 16.3 cm, height 8.8 cm, plastron length 21.7 cm, plastron width 20, 1 cm and body weight 3258 grams (when converted to kilograms to 3.2 kg). For adult females over five years, the average carapace length is 52 cm, carapace width is 48 cm, height is 22 cm, plastron length is 44 cm, plastron width is 43 cm, and body weight is 22250 gr (22.25 kg). Meanwhile, male individuals were not averaged because the population found was one individual. However, the length of the individual male carapace was 34 cm, carapace width was 28 cm, height was 13 cm, plastron length was 29.5 cm, plastron width was 28 cm, and body weight was 6 kg.

Table 1.

The results of the average morphometric measurements of Tuntong Laut from various ages

Age	Score	CL (cm)	CW (cm)	BH (cm)	PL (cm)	PW (cm)	W (gr)	TL (cm)	FL (cm)	HL (cm)	NL (cm)
7 Moun t	Rata-rata	6.2	6.2	2.5	5.6	6.1	40.8	0.9	3.2	3.5	3.3
	StandarDevias i	0.2	0.1	0.1	0.2	0.1	3.7	0.1	0.1	0.2	0.4
1,5 Year	Rata-rata	9.5	9.0	3.8	8.4	8.9	151.9	1.2	4.2	4.7	5.0
	StandarDevias i	0.7	0.4	0.3	0.5	0.4	26.7	0.1	0.3	0.4	0.4
2 Year	Rata-rata	12.1	15.4	5.3	14.1	14.3	698	2.9	5.2	8.2	8.5
	StandarDevias i	0.3	1.8	0.1	0.6	0.5	75.1	0.4	0.2	0.8	1
<5 Year	Rata-rata	24,9	16,3	8,8	21,7	20,1	3258	4,3	10,8	12,9	13
	Std. Deviation	2,4	2,6	1,1	1,6	1,9	1883	0,8	1	1,6	1,3
>5 Year	Rata-rata	52	48	22	44	43	22250	11	22	27	23
	Std. Deviation	2.6	2.2	0.6	2.6	1.2	612.4	0,4	1.3	1.8	0.0

6. INFORMATION:

CL= Carapace Length; CW= Carapace width; BH= Body Height; PL= Plastron Length; PW= Plastron Width; BW= Body Weigth; TL= Tail Length; FL= Foreleg Length; HL= Hind Leg Length; NL= Neck Length.

Based on the results of morphometric measurements of Adult TuntongLaut Individuals aged over five years, which were obtained in the Tamiang River and Iyu River from the catch using a trap, that the relationship between male and female morphometrics indicates that the morphometric size of females is generally greater when compared to males, meaning that it is different between males and females (Pritchard, 1990). The results of the comparison of morphometric sizes using *Principal Components Analysis* (PCA) can be seen in Figure 2.

Morphologically, males have a smaller size than females. Morphologically, males are smaller than females. The size of males is 17.5 cm, while for females, it is up to 60 cm (Guntoro, 2012; Praschag et al., 2007). This is also evidenced by (Moll et al., 2009, 2015), the average female TuntongLaut has a larger size when compared to male TuntongLaut. As for the age of TuntongLaut, the female obtained is estimated to be between 10-15 years. This can be seen from the carapace fins which have begun to fade, meaning they are considered to be old. Meanwhile, the male TuntongLaut found was estimated to be between 10-18 years old. Although the physical condition of males is smaller than the size of females, adult males have longer tails than females (Duli, 2009).

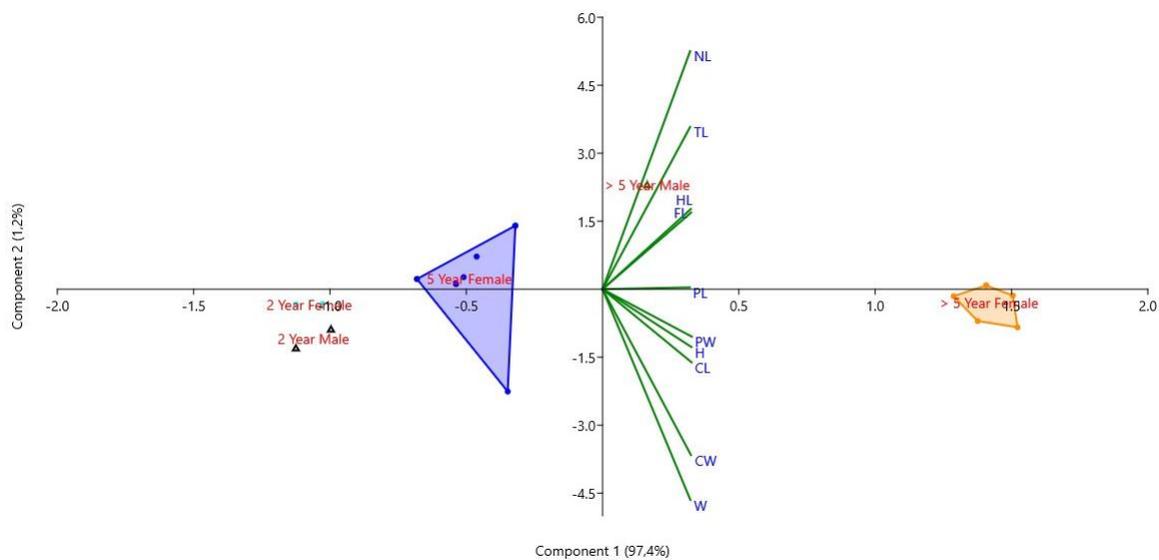


Figure 4. Biplot analysis using *Principal Components Analysis*(PCA) of the morphometric size relationship between male and female TuntongLaut.

Measurement of hatchlings morphometrics from age seven months, 1.5 years and two years. There are significant differences for each period (which can be seen in Figure 3). Specifically, the age of 1.5 years is influenced by the parameters of the length of the neck of the head, the width of the plastron, the length of the plastron, the hind legs, the forelegs, the height, the width of the carapace and the size of the carapace. The effect of head length, plastron width, plastron length, hind leg, foreleg, height, carapace width and carapace length is opposite to tail length and body weight, the lower other parameters. While the parameters of tail length and body weight have a positive correlation, indicating that the higher the body weight, the higher the tail length. The results of the biplot showed that all the morphometric sizes of hatchlings that were measured significantly had a more excellent value with the increasing age of the TuntongLaut.

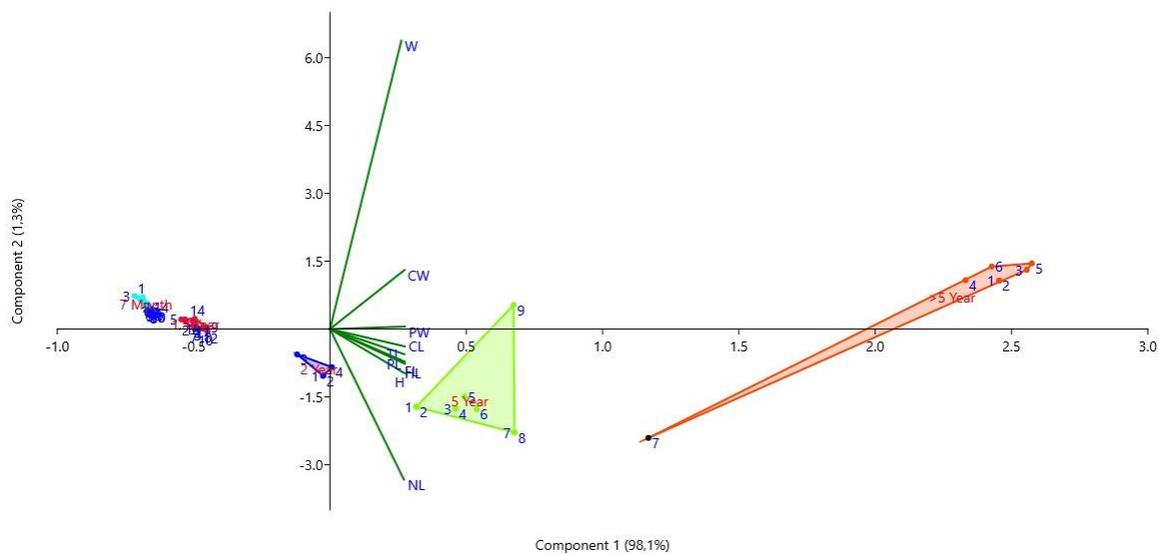


Figure 5. Biplot analysis using *Principal Components Analysis*(PCA) on the Tuntong Laut hatchlings and adult individuals and distribution by type of age.

7. CONCLUSION

Female Tuntong Lauthas a larger physical size than males. Based on the biplot analysis, the plastron length was significantly more significant than the male, as well as the female plastron width, which was considerably more significant than the male. So that the biplot analysis to see real differences in each individual is obtained. Measurement of the morphometrics of hatchlings at all ages is based on a biplot analysis that the greater the value received, physically the hatchlings generally get older.

8. ANNOUNCEMENT

We would like to thank the Aceh Province Natural Resources Conservation Center and the Aceh Tamiang district government for providing direction and input so that this research activity can be carried out well and smoothly as well as a team from the Satucita Lestari Indonesia Foundation, which has also helped a lot in assisting and assisting in carrying out research so that it can be completed on time.

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