

# Effects of Giving Bay Leaf (*Syzygium polyanthum*) Extract Into Drinking Water on External Morphometry in Mojosari Alabio (MA) Male Duck

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## ABSTRACT

Mojosari Alabio (MA) is a local breed characterized by its qualitative and quantitative specific performance. Utilization of herbs including Indonesian bay leaf containing phytochemicals such as flavonoids is a way to improve the potential and productivity of MA ducks. Flavonoid is polyphenol compounds having antiviral, antimicrobial, and antioxidant properties. This study was aimed at assessing the effects of giving drinking water containing leaf extract of Indonesian bay leaf (EDS) on the external morphometric of male MA ducks. Seventy-two MA day-old ducks were adapted to commercial rations (100% CP) and drinking water containing EDS for a week. A completely randomized design with 3 treatments and 6 replicates of 4 ducks was used. Treatments consisted of drinking water containing 0% EDS (R0), 4% EDS (R1), and 8% EDS (R2). Data were subjected to an analysis of variance and a Duncan test. Measurements were taken on head parts including bill length, bill width, head length, and head width, neck and body parts including neck length, back length and pelvic bone width, and extremities including wing length, and thigh length. Results showed that no significant effects ( $P>0.05$ ) of treatments were found all parameters measured. It was concluded that the inclusion of leaf extract of Indonesian bay leaf up to 8% in drinking water did not affect external morphometric of male MA ducks. It was recommended that further studies on the inclusion of leaf extract of Indonesian bay leaf in drinking water in higher concentration and its effect on the morphometric of male MA ducks be conducted.

**Keywords:** Duck, Indonesian bay leaf, morphometric

## 1. INTRODUCTION

Morphometric is a method of measuring genetic diversity including size and shape [1]. Morphometric parameters include body weight, beak length, beak width, head length, neck length, neck circumference, chest width, chest length, tibia length, tibial circumference, shank circumference, shank length, and 3rd toe length [2]. Body measurements can be used to study the growth and development of livestock. One of the characteristics that can be used as a differentiating variable with other local ducks is body size or morphometrics [3]. [2] Reports that high phenotypic variation is indicated because of the high genetic variation based on the selection response. Genetic diversity occurs not only between nations but also within the same nation, between populations and within populations, or between individuals in populations. Morphometric studies have been used to identify differences between duck populations, therefore morphometric measurements are a useful tool for discrimination from duck populations [4]. Flavonoids contained in bay leaves are quercetin and fluoretin [5]. Flavonoids are polyphenolic compounds that have antiviral, antimicrobial, anti-allergic, antiplatelet, anti-inflammatory, anti-tumor, and

antioxidant properties as the body's defense system [6]. The purpose of this study was to determine the impact of drinking water mixed with bay leaf extract on external morphometry of local male ducks. The benefits of this research are expected to be a source of information and a reference regarding the benefits of bay leaf extract on external morphometry in local male ducks.

## 2. MATERIALS AND METHODS

This study used a completely randomized design (CRD) consisting of 3 treatments of giving bay leaf extract in drinking water with each treatment consisting of 6 replications. The treatments given were R0 (0% bay leaf extract), R1 (4% bay leaf extract), and R2 (8% bay leaf extract). The variables observed were quantitative traits including; procedures performed according to [7] includes:

### 2.1 Head

1. Bill Length (BL) the distance between the base of the beak to the tip of the beak, as measured by digital calipers (cm).
2. Bak width (BW) is measured from the outer edge of the outer half to the left and right, using a digital calipers (cm).
3. Head Length (HL) is measured at the highest part of the head, using a digital calipers (cm).
4. Head Width (HW) is measured at the top of the head using a digital caliper (cm).

### 2.2 Neck and Body

1. Neck length (NL) was measured from the first cervical vertebrae to the last cervical vertebrae using a digital caliper (cm).
2. Back Length (BL), measured on the back using a measuring tape (cm).
3. The width of the pubic bone (WPB) is measured using a caliper

### 2.3 Parts of Motion Tools

1. Wing length (WL), the distance between the base of the humeral bone and the phalanges is measured using a measuring tape (cm).

2. Thigh Length (TL) is measured from the upper groin to the shank joint.
3. The length of the check (LC), measured from the base to the tip of the third finger, is measured using a digital calipers (cm).

### 2.4 Motion Tool Parts

1. Wing Length (WL), the distance between the base of the humeral bone and the phalanges is measured using a measuring tape (cm).
2. Thigh Length (TL) is measured from the upper groin to the shank joint.
3. The length of the check (LC), measured from the base to the tip of the third finger, is measured using a digital calipers (cm).

## 3. RESULTS AND DISCUSSION

Morphometric is a method of measuring genetic diversity including size and shape [1]. The results of the study in the form of the growth morphometry mean of Mojosari alabio (MA) ducks given bay leaf extract during the study can be seen in Table 1.

Table 1. Average of MA Ducks Growth performance During the Stusy

Morfometric	Treatment			Average $\pm$ Sd
	R0	R1	R2	
Head:				
Beak length	5,66 $\pm$ 0,51	5,83 $\pm$ 0,40	6,00 $\pm$ 0,10	5,83 $\pm$ 0,38
Width of beak	2,00 $\pm$ 0,10	2,16 $\pm$ 0,40	2,00 $\pm$ 0,10	2,05 $\pm$ 0,23
Head Length	3,16 $\pm$ 0,40	3,16 $\pm$ 0,40	3,16 $\pm$ 0,40	3,16 $\pm$ 0,38
Width of head	2,83 $\pm$ 0,40	3,16 $\pm$ 0,40	2,83 $\pm$ 0,40	2,94 $\pm$ 0,41
Neck and Body:				
Neck length	20,00 $\pm$ 2,00	20,33 $\pm$ 2,06	21,16 $\pm$ 1,32	20,50 $\pm$ 1,79
Back Length	23,50 $\pm$ 1,37	23,33 $\pm$ 2,42	23,50 $\pm$ 1,51	23,44 $\pm$ 1,72
Pubic Bone Width	5,00 $\pm$ 1,09	5,16 $\pm$ 0,75	5,33 $\pm$ 0,51	5,16 $\pm$ 0,78
Motion Tool Part				
Wing length	23,50 $\pm$ 1,97	24,00 $\pm$ 1,26	24,00 $\pm$ 1,41	23,83 $\pm$ 1,50
Thigh Length	9,16 $\pm$ 0,75	9,16 $\pm$ 0,75	9,33 $\pm$ 0,51	9,22 $\pm$ 0,64
Check Length	6,66 $\pm$ 0,51	6,83 $\pm$ 0,40	7,16 $\pm$ 0,40	6,88 $\pm$ 0,47

### Beak Length

The measurement results showed that the administration of bay leaf extract with various percentages in drinking water for male Mojosari Alabio (MA) ducks aged 2 - 10 weeks, was not significantly different ( $P > 0.05$ ) on the growth in length and width of the beak. The beak is one of the digestive organs found in the outer anatomy of poultry which functions as a tool for foraging. Furthermore [8] states that anatomically the inside of the duck's beak has a food filter called the horny lamellae (Horny lamellae). The shape of the beak in poultry is closely related to their eating habits. The shape of the beak of the duck, which is flattened and rather wide, is possible to make it easier to take food in water or semi-wet form of feed. As is well known, ducks have

a habit of eating in a leaky manner. Meanwhile, the length of the beak will affect the reach of food. The average beak length of male Mojosari Alabio (MA) ducks was  $5.83 \pm 0.38$  cm, the beak size in this study was lower than the results of other the study [9], namely  $6.92 \pm 0.30$  cm measured at the age of 45 weeks. The difference in beak size occurs due to differences in age.

### Beak Width

Ducks are a type of poultry that has a different beak shape from the shape of a chicken's beak, of course this is related to its function of finding food in places where there is water (muddy). The wider the beak, the more opportunities to take food [8]. The morphometry of beak width showed no significant

difference ( $P > 0.05$ ) in all treatments with various levels of bay leaf extract in drinking water. The average beak width is  $2.05 \pm 0.23$  cm, this result is smaller when compared to the measurement results of the half width measurement results of the research by [9] with an average of  $2.90 \pm 0.14$  cm.

### *Head Length*

The head is one of the most vital organs where there is a brain, eyes and beak. The measured head measurements are the length and width. The results of the measurement of head length showed no significant difference ( $P > 0.05$ ) for all treatments. The average head length was  $3.16 \pm 0.38$  cm when compared with the results of the study [9] is much lower, namely  $4.32 \pm 0.13$  cm.

### *Head Width*

The results of morphometric measurements on the head width of Mojosari Alabio (MA) ducks aged 2 - 10 weeks had an average head width of  $2.83 \pm 0.40$  cm, when compared with the study by [9] is lower with a mean of  $3.40 \pm 0.12$  as measured at 45 weeks of age.

### *Neck and Body*

#### *Neck Length*

The length of the neck in ducks is relatively longer with an elongated round body and is perpendicular to the shape of a bottle [10]. With its long neck, it makes it easier for the ducks to forage in areas with water. Neck length of Mojosari Alabio ducks has increased with each measurement. The neck length in this study was  $20.50 \pm 1.79$  cm, when compared with the neck length measurements made by [9] is much lower at  $22.52 \pm 1.2$  cm.

#### *Back Length*

Measurement of back length gave results that were not significantly different ( $P > 0.05$ ) on the growth of back length. Bone sizes are closely related to growth characteristics. Performance such as feather color, body size, body shape, beak color and shank that local ducks have can be characteristic, such as the length of the neck, wings, body, chest (sternum), thighs (femur) and calves [11]. The average measurement of the back is  $23.44 \pm 1.72$  cm, this result is higher than the research by [9], which is, with an average result of  $20.04 \pm 1.19$ , this result is different from the results of other measurements.

#### *Width of the Pubic Bone*

There are several characteristics related to poultry productivity, namely body weight, chest width, and shank length [12]. The results of morphometric measurements on the width of the pubic bone showed an average result of  $5.16 \pm 0.78$  cm, but this result was not significantly different ( $P > 0.05$ ) on the growth of pubic bone width, if we compare it to the morphometric measurements made

by [12], which is  $3 \pm 0.12$  cm, this result is lower than the study above.

### *Motion Tools*

#### *Wing Length*

The wing is a movement aid that is used to fly in poultry. According to [7] measuring wing length in morphometrics is measured from the base of the humeral bone to the phalanges bone measured using a measuring tape (cm). The results of morphometric measurements on the wing length are  $23.83 \pm 1.50$  cm when compared to the results of research conducted by [9] which are much lower, namely with an average of  $25.54 \pm 1.36$  cm.

#### *Thigh Length*

Animals with larger bone sizes tend to grow faster and produce larger carcasses than those with smaller bone sizes. The results of the average growth of the thigh length of male Mojosari Alabio (MA) ducks during the study ranged from  $9.22 \pm 0.64$  cm, the results were shorter when compared to the research of [9] which was  $11.69 \pm 0.66$ . In the measurement of thigh length, the highest growth is R2 and the lowest is R0 and R1.

#### *Check Length*

The fingers of a duck have a membrane that functions to make it easier for him to walk or swim in the water because ducks are semi-aquatic fowl. This opinion is the same as that expressed by [10]. Some of the characteristics of ducks include relatively short legs compared to their bodies with webbed toes (foot web), beak covered by a thin membrane with folded edges covered with horny substance, thick, greasy hair and a flat sternum. The results of morphometric measurements on claw length yielded results with an average of  $6.88 \pm 0.47$  cm.

### *Morphometric Development of MA Ducks Given Bay Leaf Extract*

In general, giving various levels of bay leaf extract in MA ducks drinking water did not have a significant effect ( $P > 0.05$ ) on all morphometric variables: head, neck and body and locomotion. In general the growth of the head (head length, head width, beak length, beak width) shows a constant increase in size.

The neck and trunk showed an increase at week 4 - 5 on the variables of neck length and back length. Likewise, the locomotion showed an increase in wing length at weeks 4 - 5. It can be said that at weeks 4 - 5 there was an increase in size simultaneously in neck length, back length and wing length.

## **4. CONCLUSIONS**

Giving bay leaf extract to a level of 8% in drinking water has not had a significant effect on the morphometrics of the head (length of the bill, width of

the beak, length of the head, width of the head), neck and body (neck length, back length, pubic bone width) and tools. motion (wing length, thigh length and claw length) of MA male ducks. Based on the results of the study, it is recommended to increase the percentage level of bay leaf extract to see the effect of the increase on the body morphometry of Mojosari Alabio male ducks.

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