

# Phenotype Characteristics of Alabio Ducks (*Anas Platyrhynchos* Borneo) in South Kalimantan

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## 7 Phenotype Characteristics of Alabio Ducks (*Anas Platyrhynchos* Borneo) in South Kalimantan

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### ABSTRACT

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Research on the phenotype characteristics of Alabio Ducks (*Anas Platyrhynchos* Borneo) in South Kalimantan was conducted to determine the phenotypic characteristics of 3 central Alabio ducks (Hulu Sungai Utara, Banjar and Tabalong Regencies). The materials used in this study were 480 Alabio ducks, aged  $\pm$  6 months, consisting of 30 males and 450 females. The method used in this research was a survey method that was multistage random sampling. The variables observed were dominance and pattern colors of feathers on neck, breast, back, wing, leg, and tail, beak color and shank color. Based on the results of observations in the Tabalong, HSU and Banjar Regencies, the results show that Alabio ducks have 6 kinds of colors that appear on observed body parts, namely black, grayish-white, blackish-gray, brownish-gray, brown, brownish-white, black, and brownish-white, light-brown spots or dark brown spots on breast feather. The colors of the beak and shank of male and female Alabio ducks are light-yellow or whitish yellow. While the uniform color characteristics are found in male and female Alabio ducks, namely on the grayish-white neck feathers, blackish gray and bluish green on wing feathers, blackish and brownish gray on back-feathers, brownish and black gray on tail-feathers and brownish-white, light brown spots, or dark brown spots on breast-feather. In conclusion, there are not many differences in both the dominant feather color, the variation in the color of the feathers, the beak, the shank of the Alabio ducks, since most of them come from the similar ancestors.

**Keywords:** Alabio ducks, characteristics, diversity, phenotype

### INTRODUCTION

South Kalimantan Province has special ducks known as Alabio ducks which are local genetic resources. Since 2011 Alabio ducks have been legalized as one of the national major ducks in the Regulation of the Minister of Agriculture, based on the Decree of the Minister of Agriculture No. 2921/Kpts/O T.140/6/2011, which states that Alabio

ducks are a wealth of genetic resources of Indonesian local livestock which have different characteristics comparing with other native ducks.

In South Kalimantan, Alabio ducks are a source of income for farmers (Susanti and Prasetyo, 2009). This because of Alabio ducks as dual-purpose type can produce large number of eggs as well duck-meat compared to other local ducks. Although Alabio ducks have relatively high diversity (Hardjosworo *et al.*, 2001 and Suryana, 2011).

Diwyanto and Inouu (2000) stated that there are two ways that can be done to improve the genetic quality of local ducks, by crossing between different lines or selection within the same line. As

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for the selection requirements, there must be phenotypic diversity in the environment that is relatively the same and reflects the existence of genotypic diversity. Selection of quantitative traits can be carried out if the coefficient of diversity is above 20% (Prasetyo, 2000). Alabio ducks have different phenotypic characteristics and varying performance compared to other local ducks in Indonesia (Suparyanto, 2005; Suyana, 2011). According to Suparyanto (2005), phenotypic variation is caused by the presence of an unstructured external cross intensity, even though the source of the parents used to be one family or ancestor. The reality in the field is that Alabio ducks in several areas in South Kalimantan have various phenotypic characters for both quantitative and qualitative (Harahap, 2005). According to Noor (2008), these differences are thought to be caused by the influence of genetic and environmental factors. Environmental influences include maintenance management, feeding and different types of feed. One of the genetic factors is the nursery system without paying attention to a structured breeding program (Susanti and Prasetyo, 2009). Furthermore, he stated that improving the productivity of a duck can be achieved by improving genetic quality, improving feed and other management. According to Harahap (2005), Genetic quality improvement is an effective way because it can have a more permanent impact. Research on the phenotype characteristics of alabio ducks in South Kalimantan has not been widely conducted. Meanwhile, research on genetics in ducks and other poultry has been reported by several researchers. Identification is one way to find out the characteristics of ducks, both qualitative and quantitative characteristics. (Mahanta *et al.*, 1999).

The purpose of this study was to determine the phenotypic characteristics of Alabio ducks in 3

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centers of alabio ducks (Hulu Sungai Utara, Tabalong and Banjar Regencies and to compare them with SNI (2009). The results of this study are expected to be a complement to the database that can be used as the basis for the regional government policies of South Kalimantan Province in the context of a program to purify, develop, and conserve alabio duck germ-plasm in a sustainable manner.

## MATERIAL AND METHOD

The research was conducted in the Regencies of Hulu Sungai Utara, Banjar and Tabalong of South Kalimantan. The research was conducted from March to September 2020. The ducks used in this study were 480 Alabio young ducks belonging to live stokers, consisting of 30 males and 450 females. with an age range of 5-8 months or have reached sexual maturity, and at that age there has been a change of adult feathers. The method used in this research was a survey method that was multistage random sampling, starting from determining Regency, district to the live stokers. Meanwhile, observations of the characteristics of Alabio ducks were carried out directly on each individual ducks. Observation data that has been collected from each respondent are then grouped according to their classification. Meanwhile, to calculate the qualitative phenotypic frequency based on the following formula (Stanfield, 1983).

## RESULTS AND DISCUSSION

### Geographical Location

Geographically, Hulu Sungai Utara (HSU) Regency is located between 217° South Latitude to 233° South Latitude and between 114.52° East Longitude to 115.24° East Longitude. Hulu Sungai

Utara is an area consisting of lowlands with an altitude ranging from 0–25 meters above sea level which is dominated by swamps, either monotonous or periodically inundated. Banjar Regency is

located in the southern part of South Kalimantan Province, at 114°30'20 "and 115°33'37" East Longitude and 2°49'55" and 3°43'38" South

Table 1. Pattern and color of alabio ducks

The observed parts	Characteristic	Research Sites (Regencies)					
		HSU		Banjar		Tabalong	
		♀ n =150	♂ n =10	♀ n =150	♂ n =10	♀ n =150	♂ n =10
Neck	Feather Color						
	Black	0	1 (10%)	0	3 (30%)	0	3 (30%)
	Gray White	50 (33.35)	8 (8%)	80 (53.3%)	5 (50%)	78 (52%)	6 (60%)
	Blackish gray	14 (9.3%)	0	8 (5.3%)	0	8 (5.3%)	0
	Brownish gray	83 (55.3%)	1 (1%)	53 (35.3)	0	56 (37.4%)	0
Back	Chocolate	3 (2%)	0	9 (6%)	2 (20%)	8 (5.3%)	1 (10%)
	Black	0	0	0	0	0	0
	Gray White	0	1 (10%)	0	2 (20%)	0	0
	Blackish gray	51 (34%)	6(60%)	54 (36%)	2 (20%)	56 (37.3%)	3 (30)
	Brownish gray	94(62.7%)	2 (20%)	79 (53%)	6 (60%)	78 (52%)	6 (60%)
Breast	Chocolate	5(3.3%)	1 (10%)	17 (11%)	0	16 (24.7%)	1 (10%)
	Black	0	0	0	0	0	0
	Gray White	6 (4%)	2 (20%)	8 (5.3%)	4 (40%)	7 (4.6%)	4 (40%)
	Blackish gray	8 (5.3%)	0	4 (2.7%)	0	4(2.6%)	0
	Brownish gray	94 (62.7)	8 (80%)	100 (66%)	6 (60%)	102 (68%)	6 (60%)
Wing	Chocolate	42 (28%)	0	38 (25.3%)	0	37 (24.7%)	0
	Black	0	0	0	0	0	0
	Gray White	64(42.6%)	3 (30%)	0	4 (40%)	0	5 (50%)
	Bluish green	56 (37.3%)	7 (70%)	0	6 (60%)	0	5 (50%)
	Brownish gray	30 (20%)	0	142 (94.7%)	0	140 (93.3%)	0
Tail	Chocolate	0	0	8 (5.3%)	0	10 (6.7%)	0
	Black	0	4(40%)	0	3 (30%)	0	2 (20%)
	Gray white	0	2 (20%)	0	3 (30%)	0	1 (10%)
	Blackish gray	0	1 (10%)	0	4(40%)	0	4 (40%)
	Brownish gray	114 (76%)	3(30%)	138 (92%)	0	132 (88%)	3 (30%)
	Chocolate	36 (24%)	0	12(8%)	0	18 (12%)	0

The data in Latitude. Its area is 4,668.50 Km<sup>2</sup> or around 12.20% of the total area of South Kalimantan Province. Geographically, Tabalong Regency is located at coordinates between 1°18' to

2°25' south latitude and 115°9' to 115°47' east longitude.



## The Dominant Feather Color of the Alabio Ducks

The research that has been done includes observations of the dominant feather color, the pattern, and the flickering-color of the feathers on neck, back/shoulder, breast, wings, and tail. The percentage of the dominant color of the alabio ducks originating from the Regencies of HSU, Banjar, and Tabalong are presented in Table 1.

Table 1, shows that female alabio ducks from Hulu Sungai Utara have brownish gray feathers on the neck (55.35%), brownish gray (62.7%) on the dorsal, brownish gray on the back. the chest (62.7%), grayish white around the wings (42.6%), and brownish gray on the tail (76%). Compared with female Alabio ducks from Banjar and Tabalong Regencies, the percentage of brownish gray color on the neck is smaller, (35.3%) and (37.4%), but the gray-brown color on the back reaches (53.3%) and (52%). Female Alabio ducks from Banjar and Tabalong Regencies have brownish (66%) and (68%) gray-brown color on their breast feather. Female alabio ducks from the Regencies of Banjar and Tabalong have brownish (66%) and gray-brown color (68%) on their breast. The percentage of brownish gray feathers on the wings of Alabio from the Regencies of Banjar and Tabalong are more dominant than HSU Regency, about 76% and 88%. The brownish gray color of the tail in the three research locations is relatively the same, in the Regencies of HSU (76%), Banjar (92%), and Tabalong (88%). The feather color of male Alabio ducks from Hulu Sungai Utara is predominantly grayish white (80%) on the neck, back is blackish gray 60%) and the breast is brownish gray (80%). While the color of the green wings is almost the same, in the Regencies of Hulu Sungai Utara (70%), Banjar (60%) and Tabalong (50%). The color of the tail

(40%) is black, this is different from the alabio ducks who come from the Regencies of Banjar and Tabalong, where the tail color is dominated by blackish gray, respectively (40%).

Comparing pattern color of the male duck among Regencies, male Alabio ducks from the Banjar Regency, brownish white color on the neck reaches (50%), brownish gray around the back (60%), and bluish green on the wings and tail are blackish gray at 60% and 40%, respectively, while the male ducks from Tabalong Regency have grayish white color around the neck (60%), the back and chest are brownish gray (50%) respectively, and (60%), on the wing the ratio of white gray to green is the same, namely (50 %). While the tail is blackish gray (40%). Differences in dominant coat color variations in male and female Alabio ducks, presumably due to differences in the selection system performed by each breeder. Breeders select the laying ducks usually based on uniform feather color and they do not use recordings. This is consistent with the statement of Suparyanto (2005) that the selection of ducks at the farmer level in rural areas usually does not use recording, because a recording system is not available or even never carried out. Selection is made based on the appearance of the body shape based on the appearance of the body shape and visible only to the condition of the body, while the extraordinary appearance of a certain feather color (characteristic), which according to the experience of breeders can be used as a reference, to predict the emergence of good traits in the next offspring. According to Suparyanto (2003), phenotypic variations are caused by the presence of external cross-intensity. Phenotypic characters that vary both for qualitative traits (coat color, color pattern, feet and beak color) that cannot be measured but can be clearly distinguished, while quantitative traits are known as production and reproduction

**Table 2.** Feather Color of Alabio Ducks

Parts of Observation	Characteristic	Research Sites					
		HSU		Banjar		Tabalong	
		♀ n =150	♂ n =10	♀ n =150	♂ n =10	♀ n =150	♂ n =10
Neck	Black	15(10%)	8(80%)	25 (17%)	9 (90%)	27 (17%)	9 (90%)
	Spotted chocolate	135(90%)	0	125 (83%)	0	123(83 %)	0
	Plain	0	2(20%)	0	1(10%)	0	1(10%)
Back	Black	10 (6,7%)	6(60%)	13 (9%)	7 (70%)	14 (9%)	7 (70%)
	Spotted chocolate	140(92,3%)	0	137 (91%)	0	136 (91%)	0
	Plain	0	4(40%)	0	3 (30%)	0	3 (30%)
Breast	Black	0	6(60%)	0	5 (50%)	0	5 (50%)
	Spotted chocolate	150 (100%)	4 (40%)	150 (100%)	5 (50%)	150 (100%)	5 (50%)
	Plain	0	0	0	0	0	0
Wings	Black	138 (92%)	0	142 (95%)	5(50%)	142 (95%)	5(50%)
	Spotted chocolate	12 (8%)	10(100%)	8 (5%)	5(50%)	8 (5%)	5(50%)
	Plain	0	0	0	0	0	0
Tail	Black	120 (80%)	0	125 (83%)	7 (70%)	125 (83%)	7 (70%)
	Spotted chocolate	30 (20%)	4 (40%)	25 (17%)	0	25 (17%)	0
	Plain	0	6(60%)	0	3 (30%)	0	3 (30%)

Notes: The color determinant uses a color catalog from *mowilex* paints

(productivity) which can be measured in units such as body weight, increased body weight, body size (morphometric) are more important because it can be used as a variable differentiating factor with other local ducks (Martoyo, 1992).

### Pattern of Feather Color

The feather color patterns of Alabio ducks from Hulu Sungai Utara, Banjar, and Tabalong Regencies are presented in Table 2.

Data Table 2, shows that the coat color of female Alabio ducks in the Hulu Sungai Utara area on the neck, has a color and a percentage of black (10%), brown spots (90%), and the back has a color and a percentage respectively black (6.7%) and

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spotted brown (92.3%), the breast (100%) is spotted brown, the wings are black (92%) and spotted brown (8%), while the tail is dominated by black (80%) and spotted chocolate (20%). While in the Banjar Regency, the feather color of female Alabio ducks is dominated by brown spots (83%) and blackish spots (17%) around on the neck. On the back is dominated by brown spots (91%) and blackish spots (9%). One hundred percent brown dots around the chest, while black and brown spots are balanced around the tail. The Alabio ducks found in the Tabalong area have almost similar feather color as those from the Banjar, this is because the Alabio ducks are both from Superior Cattle Breeding Center and Forage Animal Feed Tambang Ulang. Meanwhile, Alabio ducks found

in the HSU, some of which have livestock breed from Superior Cattle Breeding Center and Forage Animal Tambang Ulang and also some from Mamar, Hulu Sungai Utara (The central of hatchery of duck-eggs). Male Alabio ducks from the Hulu Sungai Utara Regency have brown feather with spots on them; and black on the neck (80%) and (20%), respectively, black and plain on the back (60%) and (40%), black and brown spots around the breast (60%) and (40%). 100% brown spots on the wings, and black on the tail feathers, a percentage of spotted and plain brown (40 %) and (60%).

In the Banjar Regency body parts, breast and wing feathers have the same percentage of blackish brown spots with the same ratio (50%), blackish color (90%) and plain (10%) on the neck, while blackish and the brown colored spots around the back are (9%) and (91%), the color of the feather on the tail is black (70%), and plain (30%). In Tabalong Regency, the data obtained were almost the same as the color of the neck feathers, back and wing tail.

According to Hardjosubroto (2001), variation in feather color is a qualitative trait whose expression is controlled by one or more gene pairs. The qualitative characteristics of the feather color pattern determine the effect of performance and purity of a poultry including ducks. According to Suryana (2011), the variability of feather coloration is assumed to be caused by environmental factors (maintenance management). How to keep Alabio ducks in the Banjar and Tabalong Regencies are more intensive and completely confined in cages. while Hulu Sungai Utara is maintained semi-intensively, i.e. ducks are kept in cages which are equipped with an open play yard with sufficient sunlight intensity. The intensity of the irradiation affects the intensity of the more color of the feather. This is consistent

with the statement of Warwick *et al.* (1995) stated that environmental differences and solar radiation will affect differences in color intensity, but not the basic color. Variations in coat color and pattern are also caused by the active role of various genes (Campo, 1997). Genes that affect coat color are grouped into four, namely genes that determine stripe color, color combination, color intensity, and color fading (Hardjosubroto, 2001 and Noor, 2008). Feather color variations in poultry are divided into two groups, namely the color produced by the presence of pigments with granule size and structural color, which is indicated by the presence of feathers breaking, absorbing, bending or reflecting light. Smyth (1990) reported that the diversity of skin color is also influenced by the carotenoids, melanin and xanthophil pigments that arise genetically from the body. The occurrence of various pigmentation combinations in various layers of the skin (ectodermis, mesodermis, entodermis and fibromelanose) causes different colors of the duck skin. Differences in the environment or geographic location include the intensity of solar radiation as reported by Sopiayana *et al.* (2006) will affect the intensity of coat color, but not the basic color (Warwick *et al.*, 1995 and Hardjosubroto, 2001).

### Color of the Beak, Feet, and Shank of Alabio Ducks

<sup>17</sup> The color of the beak, feet, and shank of the Alabio ducks originating from three Regencies namely Hulu Sungai Utara (HSU), Banjar and Tabalong are presented in Table 3.



**Table 3.** Color of beak, feet, and shank of Alabio ducks

Parts of Observation	Color	Research Sites					
		HSU		Banjar		Tabalong	
		♀ n =150	♂ n =10	♀ n =150	♂ n =10	♀ n =150	♂ n =10
Beak	Dark yellow	9 (6%)	3 (30%)	10 (6,7%)	2 (20%)	8 (5,3%)	4 (40%)
	Light yellow	83 (53.3%)	5 (50%)	78 (52%)	4 (40%)	79 (52.7%)	3 (30%)
	Whitish yellow	52 (34.7%)	1 (10%)	52 (34,7%)	3 (30%)	55 (36.7%)	1 (10%)
	Black	6 (4%)	1 (10%)	10 (6.6%)	1 (10%)	8 (5.3%)	2 (20%)
Feet	Dark yellow	35 (23.3%)	2 (20%)	8 (5.3%)	2 (20%)	12 (8%)	2 (20%)
	Light yellow	78 (52%)	7 (70%)	80 (53.4%)	5 (50%)	80 (53.3%)	5 (50%)
	Whitish yellow	27 (18%)	0	56 (37.3%)	2 (20%)	53 (35.4%)	2 (20%)
	Black	10 (6.7%)	1 (10%)	6 (4%)	1 (10%)	5 (3.3%)	1 (10%)
Shank	Dark yellow	16 (11.7%)	2 (20%)	12 (8%)	1 (10%)	11 (7.3%)	1 (10%)
	Light yellow	72 (48%)	6 (60%)	78 (53%)	7 (70%)	79 (52.7%)	6(60%)
	Whitish yellow	56 (37.3%)	1 (10%)	55 (36.7%)	1 (10%)	54 (36%)	2 (20%)
	Black	6 (4%)	1 (10%)	5 (3.3%)	1 (10%)	6 (4%)	1 (10%)

Note: The determination of color uses a color fan with division and classification based on previous research (Sulaiman and Rahmatullah, 2011).

Female Alabio ducks from Hulu Sungai Utara, Banjar, and Tabalong Regencies has a percentage of beak, feet, and shank color, respectively starting from light yellow (52- 53%), dark yellow (5.3- 6.7)%, whitish yellow (34.7 – 36.7)% , and black (5.3-10%). Male Alabio ducks from Hulu Sungai Utara are dominated by light color (70%) on the legs, while beak and light yellow shank were (50%) and (60%), respectively. Compared to Alabio ducks from Banjar and Tabalong Regencies the percentage of light-yellow color on the feet, and beak is relatively lower, namely in the beak ((30 - 40%), feet (50%) and the shank is relatively similar except for Banjar Regency is higher (70%). Differences in beak, feet, and shank color are influenced by different maintenance management and feeding methods. Semi-intensive rearing tends to have a yellowish beak color, this is due to the breeder feeding a large number of small fish and snails which are sources of carotenoids that the xanthophyll in the feed

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consumed by ducks affects the yellow color of the beak and skin. In addition, what causes yellow color on the beak, legs, and shank is one of the pairs of yellow (w) and xanthophyll or carotenoid genes in feed (Suparyanto, 2005). Farmers in these three regencies generally provide factory feed to the livestock they raise, this is due to the difficulty of finding raw materials, so farmers prefer to provide factory feed, besides being easy, practical, and economically the results obtained are the same.

## CONCLUSION

Based on the results obtained in the field from the three regencies that are the object of the study, conclusions can be drawn. There are not many differences in both the dominant coat color, the variation in the color of the feathers, the color of the beak, the color of the legs and the shank of the Alabio ducks, this is because the DOD comes from the same parent. The results of this study are expected to provide scientific information about



the morphological characteristics of Alabio ducks and the level of diversity in the three Regencies.

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# Phenotype Characteristics of Alabio Ducks (*Anas Platyrhynchos* Borneo) in South Kalimantan

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GENERAL COMMENTS

**Instructor**

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