

## **Phenotypic Characterization of Indonesian Local Ducks Based on Body Measurements**

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### **ABSTRACT**

The objective of this study is to phenotypically characterize body measurements among Indonesian local ducks. Eight body measurements were included in this study, namely beak width (BW), beak length (BL), neck length (NL), breast width (BD), shank length (SL), toe length (TL), foot width (FW), and claw length (CL). Total 210 individuals from seven Indonesian local ducks (Alabio, Mojosari, Magelang, Rambon, Pegagan, Bayang and Turi) were analyzed and they were reared in different areas. Pearson's correlation coefficients between body measurements were analysed within each groups. BW was found to be significant ( $P < 0.005$ ) and positively correlated with BL for 4 groups (Alabio, Magelang, Mojosari, and Pegagan). The TL was significantly ( $P < 0.005$ ) correlated with FW for 3 groups (Alabio, Magelang, and Rambon). The present study may provide some basic information for characterization and future improvement strategies among Indonesian local ducks.

**Keywords:** Phenotypic Characterization, Body Measurements, Indonesian Local Ducks

### **INTRODUCTION**

Duck farming in Indonesia is an important livestock sector, providing a food source and income to the populace through meat and eggs production. Several local ducks in Indonesia have successfully been documented and those were named according to their site origin. Although the duck production is not the major of food source, more attention is needed for improvement and sustainability of local duck production. It can be carried out through phenotypic characterization. Characterization of a breed of livestock is the first approach to a sustainable use of its animal genetic resource (Lanari, 2003). Identification and characterization of Indonesian local ducks are needed since the information is so important for germ plasm data bank as well as for assisting the genetic improvement program of the species (Ismoyowati and Purwantini, 2011). In order to characterize their genetic resources, it is importance to have knowledge about the relationship among body measurements. Measurements of various body conformations are of value in judging quantitative characteristics of meat and are helpful in developing suitable selection criteria (Jeda and Asefa, 2016). Nonetheless, phenotypic characterization of Indonesian local ducks describing relationship among body measurements are lacking and so it should be addressed toward

local ducks. In the present study, we therefore carry out a phenotypic characterization of Indonesian local ducks based on body measurement using Pearson Correlation analysis.

## MATERIALS AND METHODS

**Data collection.** Eight body measurements were included in this study, namely beak width (BW), beak length (BL), neck length (NL), breast width (BD), shank length (SL), toe length (TL), foot width (FW), and claw length (CL). Total 210 individuals from seven Indonesian local ducks (Alabio, Mojosari, Magelang, Rambon, Pegagan, Bayang and Turi) were analyzed. Samples of adult female ducks in each breed were randomly collected with the relative same of age. They were reared by farmers under a traditional system in the different area except Alabio and Mojosari ducks were reared by breeding research center belong to government.

**Location of study.** Data were collected from seven populations of duck in different areas. The Alabio and Mojosari ducks were reared in Animal Forage and Breeding Research Center (BPTU-HPT) Pelaihari, South Kalimantan while the Magelang ducks in Magelang district, Central Java. The Rambon and Pegagan ducks were collected from Cirebon district, West Java and Ogan Ilir district, South Sumatera, respectively. The Bayang ducks were collected in Pesisir Selatan district, West Sumatera.

**Statistical Analysis.** Pearson's correlation coefficients between body measurements were analysed within each groups.

**Table 1.** Quantitative traits of seven duck populations

Traits	Breeds	N	Mean	SE	CV	Traits	Breeds	N	Mean	SE	CV
BW	AL	30	2.77	0.01	2.33	SL	AL	30	6.61	0.04	3.58
	MJ	30	2.87	0.02	3.61		MJ	30	6.53	0.04	3.67
	BY	30	2.86	0.02	4.17		BY	30	6.52	0.05	4.42
	MG	30	2.82	0.02	4.43		MG	30	6.27	0.09	7.54
	PG	30	2.82	0.03	4.96		PG	30	6.42	0.06	4.74
	RM	30	2.65	0.02	3.46		RM	30	6.84	0.06	5.09
	TR	30	2.75	0.01	2.63		TR	30	7.00	0.10	7.62
BL	AL	30	5.92	0.05	5.21	TL	AL	30	6.14	0.05	4.34
	MJ	30	6.15	0.03	3.20		MJ	30	6.27	0.05	4.28
	BY	30	5.97	0.05	4.37		BY	30	6.54	0.06	5.01
	MG	30	5.95	0.06	5.58		MG	30	7.23	0.12	9.12
	PG	30	6.01	0.05	4.91		PG	30	6.00	0.06	5.56
	RM	30	6.09	0.06	5.81		RM	30	6.14	0.07	6.54
	TR	30	6.17	0.04	3.63		TR	30	6.24	0.05	4.79
NL	AL	30	17.14	0.14	4.76	FW	AL	30	7.44	0.05	3.98
	MJ	30	17.25	0.22	7.18		MJ	30	7.88	0.07	4.90
	BY	30	15.90	0.22	7.59		BY	30	7.32	0.07	5.50
	MG	30	14.83	0.22	8.15		MG	30	6.56	0.10	8.05
	PG	30	16.51	0.22	7.43		PG	30	7.05	0.12	9.11
	RM	30	15.45	0.22	8.02		RM	30	6.75	0.08	6.67
	TR	30	19.24	0.23	6.70		TR	30	7.16	0.06	5.00
BD	AL	30	8.66	0.06	3.69	CL	AL	30	1.44	0.02	8.79
	MJ	30	8.08	0.06	4.50		MJ	30	1.30	0.01	6.48
	BY	30	8.16	0.09	5.82		BY	30	1.09	0.02	9.59
	MG	30	8.64	0.12	7.54		MG	30	1.23	0.02	7.74
	PG	30	9.02	0.09	5.57		PG	30	1.09	0.01	7.54
	RM	30	7.73	0.09	6.59		RM	30	1.10	0.01	7.46
	TR	30	8.22	0.08	5.66		TR	30	1.10	0.02	8.91

## RESULTS AND DISCUSSION

The means ( $\pm$ SE) and coefficients of variation of body measurements of the seven groups investigated are presented in Table 1. Correlation among the traits are shown in Table 2. The means of body measurements ranged between 2.65 cm and 2.87 cm for beak width, 5.92 cm and 6.19 cm for beak length, 14.83 cm and 19.24 cm for neck length, 7.73 cm and 9.02 cm for breast width, 6.27 cm and 7.00 cm for shank length, 6.00 cm and 7.23 cm for toe length, 6.56 cm and 7.88 cm for foot width, 1.10 cm and 1.44 cm for claw length. Correlation among the several body measurements were highly significant ( $P < 0.01$  and  $P < 0.05$ ). The correlation among body measurements ranged between -0.17 (NL and CL) and 0.62 (BW and BL) for Alabio, -0.18 (BL and CL) and 0.43 (BD and CL) for Mojosari, -0.45 (FW and CL) and 0.55 (BL and NL) for Magelang, -0.23 (BD and TL) and 0.58 (BW and BL) for Pegagan, -0.06 (TL and CL) and 0.72 (BW and FW) for Rambon, -0.16 (NL and SL) and 0.41 (BW and TL) for Turi, -0.10 (SL and CL) and 0.37 (BW and TL) for Bayang. Some of body measurements had a strong relationship, revealing that an improvement in one trait could lead to an improvement in other body traits. Among the body measurements, the strong correlation was indicated between beak length and beak width for Alabio, Mojosari, Pegagan and Magelang, while high correlation was also found between beak width and foot width for Alabio, Rambon and Magelang. The correlation may be useful as selection criteria in animal breeding. Strong positive correlation between two traits suggested that they may be under the same genetic influences. Okon et al., (1997) reported that inter-relationships among body measurement can be applied speedily in the selection and breeding. This characterisation of local ducks is a necessary prerequisite for local breed development and the development of rural poultry.

## CONCLUSIONS

In this study, beak length, beak width, and foot width can be proposed that these traits may can be used as a criteria for selecting adult duck as they have strong correlation.

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